Financial and Managerial Accounting

Financial and Managerial Accounting

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AFFORDABLE COURSE TRANSFORMATION: THE PENNSYLVANIA STATE UNIVERSITY

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This Open Educational Resource textbook has been adapted from the following 2 OpenStax textbooks:

- OpenStax: Principles of Accounting, Volume 1: Financial Accounting
- OpenStax: Principles of Accounting, Volume 2: Managerial Accounting

OpenStax: Principles of Accounting, Volume 1: Financial Accounting

- Chapter 1: Role of Accounting in Society
- Chapter 2: Introduction to Financial Statements
- Chapter 3: Analyzing and Recording Transactions
- Chapter 4: The Adjustment Process
- Chapter 5: Completing the Accounting Cycle
- Chapter 6: Merchandising Transactions
- Chapter 8: Fraud, Internal Controls, and Cash
- Chapter 9: Accounting for Receivables
- Chapter 10: Inventory
- Chapter 11: Long-term Assets
- Chapter 12: Current Liabilities
- Chapter 13: Long-term Liabilities
- Chapter 14: Corporation Accounting

OpenStax Principles of Accounting, Volume 2: Managerial Accounting

- Chapter 3: Cost-Volume-Profit Analysis

- Chapter 4: Job Order Costing
- Chapter 5: Process Costing
- Chapter 6: Activity-Based, Variable, and Absorption Costing
- Chapter 7: Budgeting
- Chapter 8: Standard Costs and Variances

Chapters and sections were borrowed and adapted from the above existing OER textbooks. Without these foundational texts, a lot more work would have been required to complete this project. Thank you to those who shared before us.

OPEN EDUCATIONAL RESOURCES

This text is provided to you as an Open Educational Resource (OER) which you access online. It is designed to give you a comprehensive introduction to accounting at no or very nominal cost. It contains both written and graphic text material, intra-text links to other internal material which may aid in understanding topics and concepts and extra-text links to videos and web material that clarifies and augments topics and concepts.

Why did I create this accounting textbook?

First...

Textbook prices for introductory accounting courses are typically very high and new editions are frequently introduced, limiting the resale value and use of older editions. Simply put, a free, open-source textbook increases accessibility by eliminating the cost barrier. Free is my favorite price!

Second...

Accounting textbooks also commonly seen as... BORING!



Cat sleeping on furniture

Can learning accounting be interesting?

This book is uniquely constructed to integrate reading, video tutorials, links and practice to make learning... dare I write it...

FUN! OK, maybe that's overstating a bit, but this is not your typical accounting text.

Throughout the chapters, you'll find links to short videos (screencasts in YouTube). Each is like a mini-lecture, 4-7 minutes where I'm teaching a nugget of content. I use humor (check out the James Bond reference in the chapter on long-term debt) and silly examples to highlight important concepts and make them memorable.

In a few cases, you'll be taken to links for other types of resources- interactive learning opportunities. Don't just pass them by! Engage in these activities to experience "active reading."

Links to professional organizations and government entities are also provided- to connect what we're learning to the "real world."

Also sprinkled throughout are "Your Turn" text blocks. In each, you're asked to practice the concept, computation, or accounting entries just presented in the text. The solution is provided for you to learn- take advantage of these opportunities to test your understanding.

I'm excited to share this resource with you and I look forward to learning accounting together!

Sincerely,

Lolita Paff, Ph.D.

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attention to detail facilitated the transformation of a loose idea into a unique financial and managerial accounting textbook.

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INTRODUCTION

Financial Accounting - The Public Language of Business

Accounting is the process of organizing, analyzing, and communicating financial information that is used for decision-making. Financial information is typically prepared by accountants—those trained in the specific techniques and practices of the profession. This course explores many of the topics and techniques related to the accounting profession. While many students will directly apply the knowledge gained in this course to continue their education and become accountants and business professionals, others might pursue different career paths.

A solid understanding of accounting can for many still serve as a useful resource. In fact, it is hard to think of a profession where a foundation in the principles of accounting would not be beneficial. Therefore, one of the goals of this course is to provide a solid understanding of how financial information is prepared and used in the workplace, regardless of your particular career path.

A traditional adage states that “accounting is the language of business.” While that is true, you can also say that “accounting is the language of life.” At some point, most people will make a decision that relies on accounting information. For example, you may have to decide whether it is better to lease or buy a vehicle. Likewise, a college graduate may have to decide whether it is better to take a higher-paying job in a bigger city (where the cost of living is also higher) or a job in a smaller community where both the pay and cost of living may be lower.

In a professional setting, a theater manager may want to know:

- Was the most recent play profitable?
- How many tickets do we need to sell to break-even? Or, to achieve a target profit?



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Similarly, the owner of the local plumbing business may want to know:

- Is it worthwhile to pay an employee to be "on call" for emergencies during off-hours and weekends?
- What should be the business's minimum charge for a house call?

Whether personal or professional, accounting information plays a vital role in all of these decisions.



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You may have noticed that the decisions in these scenarios would be based on factors that include both financial and non-financial information. For instance, when deciding whether to lease or buy a vehicle, you would consider not only the monthly payments but also such factors as vehicle maintenance and reliability.

The college graduate considering two job offers might weigh factors such as working hours, ease of commuting, and options for shopping and entertainment. The theater manager would analyze the proceeds from ticket sales and sponsorships as well as the expenses for production of the play and operating the concessions. In addition, the theater manager should consider how the financial performance of the play might have been influenced by the marketing of the play, the weather during the performances, and other factors such as competing events during the time of the play. All of these factors, both financial and non-financial, are relevant to the financial performance of the play.

In addition to the additional cost of having an employee "on

call" during evenings and weekends, the owner of the local plumbing business would consider non-financial factors in the decision. For instance, if there are no other plumbing businesses that offer services during evenings and weekends, offering emergency service might give the business a strategic advantage that could increase overall sales by attracting new customers.

This course explores the role that accounting plays in society. You will learn about financial accounting, which measures the financial performance of an organization using standard conventions to prepare and distribute financial reports. Financial accounting is used to generate information for stakeholders outside of an organization, such as:

- owners,
- stockholders,
- lenders,
- governmental entities such as Internal Revenue Service (IRS website)

Financial accounting is also a foundation for understanding managerial accounting, which uses both financial and non-financial information as a basis for making decisions within an organization with the purpose of equipping decision makers to set and evaluate business goals by determining what information they need to make a particular decision and how to analyze and communicate this information. Managerial accounting information tends to be used internally, for such purposes as budgeting, pricing, and determining production costs. Since the information is generally used internally, you do not see the same need for financial oversight in an organization's managerial data.

You will also note in your financial accounting studies that there are governmental and organizational entities that oversee the accounting processes and systems that are used in

financial accounting. These entities include organizations such as the

- Securities and Exchange Commission (SEC website),
- Financial Accounting Standards Board (FASB website),
- American Institute of Certified Public Accountants (AICPA website),
- Public Company Accounting Oversight Board (PCAOB website).

The PCAOB was created after several major cases of corporate fraud, leading to the Sarbanes-Oxley Act of 2002, known as SOX. If you choose to pursue more advanced accounting courses, especially auditing courses, you will address the SOX in much greater detail.

For now, it is not necessary to go into greater detail about the mechanics of these organizations or other accounting and financial legislation. You just need to have a basic understanding that they function to provide a degree of protection for those outside of the organization who rely on the financial information.

Whether or not you aspire to become an accountant, understanding financial and managerial accounting is valuable and necessary for practically any career you will pursue.

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Characteristics, Users and Sources of Accounting Information

Financial Accounting Information

The ultimate goal of accounting is to provide information that is useful for decision-making. Users of accounting information are generally divided into two categories: internal and external. Internal users are those within an organization who use financial information to make day-to-day decisions. Internal users include managers and other employees who use financial information to confirm past results and help make adjustments for future activities.

External users are those outside of the organization who use the financial information to make decisions or to evaluate an entity's performance. For example, investors, financial analysts, loan officers, governmental auditors, such as IRS agents, and an assortment of other stakeholders are classified as external users, while still having an interest in an organization's financial information.

Organizations measure financial performance in monetary terms. In the United States, the dollar is used as the standard measurement basis. Measuring financial performance in monetary terms allows managers to compare the organization's performance to previous periods, to expectations, and to other organizations or industry standards.

Financial accounting is one of the broad categories in the study of accounting. While some industries and types of organizations have variations in how the financial information is prepared and communicated, accountants generally use the same methodologies—called accounting standards—to prepare the financial information.

Virtually every activity and event that occurs in a business has an associated cost or value and is known as a transaction. Part of an accountant's responsibility is to quantify these activities and events. In this course you will learn about the many types of transactions that occur within a business. You will also examine the effects of these transactions, including their impact on the financial position of the entity.

Accountants often use computerized accounting systems to record and summarize the financial reports, which offer many benefits. The primary benefit of a computerized accounting system is the efficiency by which transactions can be recorded and summarized, and financial reports prepared. In addition, computerized accounting systems store data, which allows organizations to easily extract historical financial information.



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Common computerized accounting systems include QuickBooks, which is designed for small organizations, and SAP, which is designed for large and/or multinational organizations. QuickBooks is popular with smaller, less complex entities. It is less expensive than more sophisticated software packages, such as Oracle or SAP, and the QuickBooks skills that accountants developed at previous employers tend to be applicable to the needs of new employers, which can reduce both training time and costs spent on acclimating new employees to an employer's software system. Also, being familiar with a common software package such as QuickBooks helps provide employment mobility when workers wish to reenter the job market.

While QuickBooks has many advantages, once a company's operations reach a certain level of complexity, it will need a basic software package or platform, such as Oracle or SAP, which is then customized to meet the unique informational needs of the entity.

Financial accounting information is mostly historical in nature, although companies and other entities also incorporate estimates into their accounting processes. For example, you will learn how to use estimates to determine bad debt expenses or depreciation expenses for assets that will be used over a multiyear lifetime. That is, accountants prepare financial reports that summarize what has already occurred in an organization. This information provides what is called feedback value. The benefit of reporting what has already occurred is the reliability of the information. Accountants can, with a fair amount of confidence, accurately report the financial performance of the organization related to past activities. The feedback value offered by the accounting information is particularly useful to internal users. That is, reviewing how the organization performed in the past can help managers and other employees make better decisions about and adjustments to future activities.

Financial information has limitations, however, as a predictive tool. Business involves a large amount of uncertainty, and accountants cannot predict how the organization will perform in the future. However, by observing historical financial information, users of the information can detect patterns or trends that may be useful for estimating the company's future financial performance. Collecting and analyzing a series of historical financial data is useful to both internal and external users. For example, internal users can use financial information as a predictive tool to assess whether the long-term financial performance of the organization aligns with its long-term strategic goals.

External users also use the historical pattern of an organization's financial performance as a predictive tool. For example, when deciding whether to loan money to an organization, a bank may require a certain number of years of financial statements and other financial information from the organization. The bank will assess the historical performance in order to make an informed decision about the organization's ability to repay the loan and interest (the cost of borrowing money). Similarly, a potential investor may look at a business's past financial performance in order to assess whether or not to invest money in the company. In this scenario, the investor wants to know if the organization will provide a sufficient and consistent return on the investment. In these scenarios, the financial information provides value to the process of allocating scarce resources (money). If potential lenders and investors determine the organization is a worthwhile investment, money will be provided, and, if all goes well, those funds will be used by the organization to generate additional value at a rate greater than the alternate uses of the money.

Managerial Accounting Information

Managerial accounting information is different from financial accounting information in several respects. Accountants use formal accounting standards in financial accounting. These accounting standards are referred to as generally accepted accounting principles (GAAP) and are the common set of rules, standards, and procedures that publicly traded companies must follow when composing their financial statements. The previously mentioned Financial Accounting Standards Board (FASB website), an independent, nonprofit organization that sets financial accounting and reporting standards for both public and private sector businesses in the United States, uses the GAAP guidelines as its foundation for its system of accepted accounting methods and practices, reports, and other documents.

Since most managerial accounting activities are conducted for internal uses and applications, managerial accounting is not prepared using a comprehensive, prescribed set of conventions similar to those required by financial accounting. This is because managerial accountants provide managerial accounting information that is intended to serve the needs of internal, rather than external, users. In fact, managerial accounting information is rarely shared with those outside of the organization. Since the information often includes strategic or competitive decisions, managerial accounting information is often closely protected. The business environment is constantly changing, and managers and decision makers within organizations need a variety of information in order to view or assess issues from multiple perspectives.

Accountants must be adaptable and flexible in their ability to generate the necessary information management decision-making. For example, information derived from a computerized accounting system is often the starting point for obtaining managerial accounting information. But

accountants must also be able to extract information from other sources (internal and external) and analyze the data using mathematical, formula-driven software (such as Microsoft Excel).

Management accounting information as a term encompasses many activities within an organization. Preparing a budget, for example, allows an organization to estimate the financial performance for the upcoming year or years and plan for adjustments to scale operations according to the projections. Accountants often lead the budgeting process by gathering information from internal (estimates from the sales and engineering departments, for example) and external (trade groups and economic forecasts, for example) sources. These data are then compiled and presented to decision makers within the organization.

Examples of other decisions that require management accounting information include whether an organization should repair or replace equipment, make products internally or purchase the items from outside vendors, and hire additional workers or use automation.

Management accounting information uses both financial and nonfinancial information. This is important because there are situations in which a purely financial analysis might lead to one decision, while considering nonfinancial information might lead to a different decision. For example, suppose a financial analysis indicates that a particular product is unprofitable and should no longer be offered by a company. If the company fails to consider that customers also purchase a complementary good (you might recall that term from your study of economics), the company may be making the wrong decision. For example, assume that you have a company that produces and sells both computer printers and the replacement ink cartridges. If the company decided to eliminate the printers, then it would also lose the cartridge sales. In the past, in some cases, the elimination of one

component, such as printers, led to customers switching to a different producer for its computers and other peripheral hardware. In the end, an organization needs to consider both the financial and nonfinancial aspects of a decision, and sometimes the effects are not intuitively obvious at the time of the decision. the table below offers an overview of some of the differences between financial and managerial accounting.

Comparing Reports between Financial and Managerial Accounting. By: Rice University OpenStax CC BY-NC-SA 4.0

COMMUNICATION THROUGH REPORTING	FINANCIAL ACCOUNTING	MANAGERIAL ACCOUNTING
Users of reports	External users: stockholders, creditors, regulators	Internal users: managers, officers, and other employees
Types of reports	Financial statements: balance sheet, income statement, cashflow statement, etc.	Internal reports: job cost sheet, cost of goods manufactured, production cost report, etc.
Frequency of reports	Quarterly; annually	As frequently as needed
Purpose of reports	Helps those external users make decisions: credit terms, investment, and other decisions	Assists the internal users in the planning and control decisionmaking process
Focus of reports	Pertains to company as a whole Uses GAAP structure Composed from a multitude or combination of other more individual data	Pertains to departments, sections of the business Very detailed reporting No GAAP constraints
Nature of reports	Monetary	Monetary and nonmonetary information
Verification of reports	Audited by CPA	No independent audits

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Accounting in Different Organizations

We can classify organizations into three categories: for profit, governmental, and not for profit. These organizations are similar in several aspects. For example, each of these organizations has inflows and outflows of cash and other resources, such as equipment, furniture, and land, that must be managed. In addition, all of these organizations are formed for a specific purpose or mission and want to use the available resources in an efficient manner—the organizations strive to be good stewards, with the underlying premise of being profitable. Finally, each of the organizations makes a unique and valuable contribution to society. Given the similarities, it is clear that all of these organizations have a need for accounting information and for accountants to provide that information.

There are also several differences. The main difference that distinguishes these organizations is the primary purpose or mission of the organization, discussed in the following sections.

For-Profit Businesses

As the name implies, the primary purpose or mission of a for-profit business is to earn a profit by selling goods and services. There are many reasons why a for-profit business seeks to earn a profit. The profits generated by these organizations might be used to create value for employees in the form of pay raises for existing employees as well as hiring additional workers. In addition, profits can be reinvested in the business to create value in the form of research and development, equipment upgrades, facilities expansions, and many other activities that

make the business more competitive. Many companies also engage in charitable activities, such as donating money, donating products, or allowing employees to volunteer in the communities. Finally, profits can also be shared with employees in the form of either bonuses or commissions as well as with owners of the business as a reward for the owners' investment in the business. These issues, along with others, and the associated accounting conventions will be explored throughout this course.

In for-profit businesses, accounting information is used to measure the financial performance of the organization and to help ensure that resources are being used efficiently. Efficiently using existing resources allows the businesses to improve quality of the products and services offered, remain competitive in the marketplace, expand when appropriate, and ensure longevity of the business.

For-profit businesses can be further categorized by the types of products or services the business provides. Let's examine three types of for-profit businesses: manufacturing, retail (or merchandising), and service.

Manufacturing Businesses

A manufacturing business is a for-profit business that is designed to make a specific product or products. Manufacturers specialize in procuring components in the most basic form (often called direct or raw materials) and transforming the components into a finished product that is often drastically different from the original components.

As you think about the products you use every day, you are probably already familiar with products made by manufacturing firms. Examples of products made by manufacturing firms include automobiles, clothes, cell phones,

computers, and many other products that are used every day by millions of consumers.

Later, you will examine the process of job costing, learning how manufacturing firms transform basic components into finished, sellable products and the techniques accountants use to record the costs associated with these activities.

CONCEPTS IN PRACTICE

Manufacturing

Think about the items you have used today. Make a list of the products that were created by manufacturing firms. How many can you think of? Think of the many components that went into some of the items you use. Do you think the items were made by machines or by hand?

If you are in a classroom with other students, see who has used the greatest number of items today. Or, see who used the item that would be the most complex to manufacture.

If you are able, you might consider arranging a tour of a local manufacturer. Many manufacturers are happy to give tours of the facilities and describe the many complex processes that are involved in making the products. On your tour, take note of the many job functions that are required to make those items—from ordering the materials to delivering to the customer.

Retail Businesses

Manufacturing businesses and retail (or merchandising) businesses are similar in that both are for-profit businesses that sell products to consumers. In the case of manufacturing firms, by adding direct labor, manufacturing overhead (such as utilities, rent, and depreciation), and other direct materials, raw components are converted into a finished product that is sold to consumers. A retail business (or merchandising business), on the other hand, is a for-profit business that purchases products (called inventory) and then resells the products without altering them—that is, the products are sold directly to the consumer in the same condition (production state) as purchased.

Examples of retail firms are plentiful. Automobile dealerships, clothes, cell phones, and computers are all examples of everyday products that are purchased and sold by retail firms. What distinguishes a manufacturing firm from a retail firm is that in a retail firm, the products are sold in the same condition as when the products were purchased—no further alterations were made on the products.

Did you happen to notice that the product examples listed in the preceding paragraph (automobiles, clothes, cell phones, and computers) for manufacturing firms and retail firms are identical? If so, congratulations, because you are paying close attention to the details. These products are used as examples in two different contexts—that is, manufacturing firms *make* these products, and retail firms *sell* these products. These products are relevant to both manufacturing and retail because they are examples of goods that are both manufactured and sold directly to the consumer. While there are instances when a manufacturing firm also serves as the retail firm (**Dell** computers, for example), it is often the case that products will be manufactured and sold by separate firms.

CONCEPTS IN PRACTICE

NIKEiD

NIKEiD is a program that allows consumers to design and purchase customized equipment, clothes, and shoes. In 2007, **Nike** opened its first NIKEiD studio at Niketown in New York City.[1] Since its debut in 1999, the NIKEiD concept has flourished, and **Nike** has partnered with professional athletes to showcase their designs that, along with featured consumer designs, are available for purchase on the NIKEiD website.



NIKEiD Launch Store in Shanghai. By KimChi, Dr. Beezy, Thay Thay. Wikimedia CC BY

1. Niketown "Nike Opens New NIKEiD Studio in New York," October 4, 2007.

Assume you are the manager of a sporting goods store that sells Nike shoes. Think about the concept of NIKEiD, and consider the impact that this concept might have on your store sales. Would this positively or negatively impact the sale of **Nike** shoes in your store? What are steps you could take to leverage the NIKEiD concept to help increase your own store's sales?

Considerations like this are examples of what marketing professionals would address. **Nike** wants to ensure this concept does not negatively impact the existing relationships it has, and **Nike** works to ensure this program is also beneficial to its existing distribution partners.

Service Businesses

As the term implies, service businesses are businesses that provide services to customers. A major difference between manufacturing and retail firms and service firms is that service firms do not have a tangible product that is sold to customers. Instead, a service business does not sell tangible products to customers but rather provides intangible benefits (services) to customers. A service business can be either a for-profit or a not-for-profit business. The figure below illustrates the distinction between manufacturing, retail, and service businesses.

Examples of service-oriented businesses include hotels, cab services, entertainment, and tax preparers. Efficiency is one advantage service businesses offer to their customers. For example, while taxpayers can certainly read the tax code, read the instructions, and complete the forms necessary to file their annual tax returns, many choose to take their tax returns to a person who has specialized training and experience with preparing tax returns. Although it is more expensive to do so,

many feel it is a worthwhile investment because the tax professional has invested the time and has the knowledge to prepare the forms properly and in a timely manner. Hiring a tax preparer is efficient for the taxpayer because it allows the taxpayer to file the required forms without having to invest numerous hours researching and preparing the forms.

The accounting conventions for service businesses are similar to the accounting conventions for manufacturing and retail businesses. In fact, the accounting for service businesses is easier in one respect. Because service businesses do not sell tangible products, there is no need to account for products that are being held for sale (inventory). Therefore, while we briefly discuss service businesses, we'll focus mostly on accounting for manufacturing and retail businesses.



Manufacturing, Retail, and Service. An auto manufacturing plant, a car sales lot, and a taxi represent three types of businesses: manufacturing, retail, and service. (credit left: modification of "Maquiladora" by "Guldhammer"/Wikimedia Commons, CC0; credit center: modification of "Mercedes Benz Parked" by unknown/Pixabay, CC0; credit right: modification of "Taxi Overtaking Bus" by "Kai Pilger"/Pixabay, CC0)

YOUR TURN

Categorizing Restaurants

So far, you've learned about three types of for-profit businesses: manufacturing, retail, and service. In some cases, firms such as **Dell** serve as both manufacturer and retailer.

Now, think of the last restaurant where you ate. Of the three business types (manufacturer, retailer, or service provider), how would you categorize the restaurant? Is it a manufacturer? A retailer? A service provider? Can you think of examples of how a restaurant has characteristics of all three types of businesses?

Solution

Answers will vary. Responses may initially consider a restaurant to be only a service provider. Students may also recognize that a restaurant possesses aspects of a manufacturer (by preparing the meals), retailer (by selling merchandise and/or gift cards), and service provider (by waiting on customers).

Governmental Entities

A governmental entity provides services to the general public (taxpayers). Governmental agencies exist at the federal, state, and local levels. These entities are funded through the issuance of taxes and other fees.

Accountants working in governmental entities perform the same function as accountants working at for-profit businesses. Accountants help to serve the public interest by providing to the public an accounting for the receipts and disbursements of taxpayer dollars. Governmental leaders are accountable to

taxpayers, and accountants help assure the public that tax dollars are being utilized in an efficient manner.

Examples of governmental entities that require financial reporting include federal agencies such as the Social Security Administration, state agencies such as the Department of Transportation, and local agencies such as county engineers.

Students continuing their study of accounting may take a specific course or courses related to governmental accounting. While the specific accounting used in governmental entities differs from traditional accounting conventions, the goal of providing accurate and unbiased financial information useful for decision-making remains the same, regardless of the type of entity. Government accounting standards are governed by the Governmental Accounting Standards Board (GASB). This organization creates standards that are specifically appropriate for state and local governments in the United States.

Not-for-Profit Entities

To be fair, the name "not-for-profit" can be somewhat confusing. As with "for-profit" entities, the name refers to the primary purpose or mission of the organization. In the case of for-profit organizations, the primary purpose is to generate a profit. The profits, then, can be used to sustain and improve the business through investments in employees, research, and development, and other measures intended to help ensure the long-term success of the business.

But in the case of a nonprofit (not-for-profit) organization the primary purpose or mission is to serve a particular interest or need in the community. A not-for-profit entity tends to depend on financial longevity based on donations, grants, and revenues generated. It may be helpful to think of not-for-profit entities as "mission-based" entities. It is important to note that not-for-profit entities, while having a primary purpose of

serving a particular interest, also have a need for financial sustainability. An adage in the not-for-profit sector states that "being a not-for-profit organization does not mean it is for-loss." That is, not-for-profit entities must also ensure that resources are used efficiently, allowing for inflows of resources to be greater than (or, at a minimum, equal to) outflows of resources. This allows the organization to continue and perhaps expand its valuable mission.

Examples of not-for-profit entities are numerous. Food banks have as a primary purpose the collection, storage, and distribution of food to those in need. Charitable foundations have as a primary purpose the provision of funding to local agencies that support specific community needs, such as reading and after-school programs. Many colleges and universities are structured as not-for-profit entities because the primary purpose is to provide education and research opportunities.

Similar to accounting for governmental entities, students continuing their study of accounting may take a specific course or courses related to not-for-profit accounting. While the specific accounting used in not-for-profit entities differs slightly from traditional accounting conventions, the goal of providing reliable and unbiased financial information useful for decision-making is vitally important.

YOUR TURN

Types of Organizations

Think of the various organizations discussed so far. Now try to identify people in your personal and professional network who

work for these types of agencies. Can you think of someone in a career at each of these types of organizations?

One way to explore career paths is to talk with professionals who work in the areas that interest you. You may consider reaching out to the individuals you identified and learning more about the work that they do. Find out about the positive and negative aspects of the work. Find out what advice they have relating to education. Try to gain as much information as you can to determine whether that is a career you can envision yourself pursuing. Also, ask about opportunities for job shadowing, co-ops, or internships.

Solution

Answers will vary, but this should be an opportunity to learn about careers in a variety of organizations (for-profit including manufacturing, retail, and services; not-for-profit; and governmental agencies). You may have an assumption about a career that is based only on the positive aspects. Learning from experienced professionals may help you understand all aspects of the careers. In addition, this exercise may help you confirm or alter your potential career path, including the preparation required (based on advice given from those you talk with).

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Stakeholders

The number of decisions we make in a single day is staggering. For example, think about what you had for breakfast this morning. What pieces of information factored into that decision? A short list might include the foods that were available in your home, the amount of time you had to prepare and eat the food, and what sounded good to eat this morning. Let's say you do not have much food in your home right now because you are overdue on a trip to the grocery store. Deciding to grab something at a local restaurant involves an entirely new set of choices. Can you think of some of the factors that might influence the decision to grab a meal at a local restaurant?

YOUR TURN

Daily Decisions

Many academic studies have been conducted on the topic of consumer behavior and decision-making. It is a fascinating topic of study that attempts to learn what type of advertising works best, the best place to locate a business, and many other business-related activities.

One such study, conducted by researchers at Cornell University, concluded that people make more than 200 food-related decisions per day.[2]

This is astonishing considering the number of decisions found in this particular study related only to decisions involving food. Imagine how many day-to-day decisions involve other

issues that are important to us, such as what to wear and how to get from point A to point B. For this exercise, provide and discuss some of the food-related decisions that you recently made.

Solution

In consideration of food-related decisions, there are many options you can consider. For example, what types, in terms of ethnic groups or styles, do you prefer? Do you want a dining experience or just something inexpensive and quick? Do you have allergy-related food issues? These are just a few of the myriad potential decisions you might make.

It is no different when it comes to financial decisions. Decision makers rely on unbiased, relevant, and timely financial information in order to make sound decisions. In this context, the term stakeholder refers to a person or group who relies on financial information to make decisions, since they often have an interest in the economic viability of an organization or business. Stakeholders may be stockholders, creditors, governmental and regulatory agencies, customers, management and other employees, and various other parties and entities.

Stockholders

A stockholder is an owner of stock in a business. Owners are called stockholders because in exchange for cash, they are given an ownership interest in the business, called stock. Stock is sometimes referred to as "shares." Historically, stockholders received paper certificates reflecting the number of stocks owned in the business. Now, many stock transactions are recorded electronically.

Recall that organizations can be classified as for-profit, governmental, or not-for-profit entities. Stockholders are

associated with for-profit businesses. While governmental and not-for-profit entities have constituents, there is no direct ownership associated with these entities.

For-profit businesses are organized into three categories: manufacturing, retail (or merchandising), and service. Another way to categorize for-profit businesses is based on the availability of the company stock (see the table below). A publicly traded company is one whose stock is traded (bought and sold) on an organized stock exchange such as the New York Stock Exchange (NYSE website) or the National Association of Securities Dealers Automated Quotation (NASDAQ website) system. Most large, recognizable companies are publicly traded, meaning the stock is available for sale on these exchanges. A privately held company, in contrast, is one whose stock is not available to the general public. Privately held companies, while accounting for the largest number of businesses and employment in the United States, are often smaller (based on value) than publicly traded companies. Whereas financial information and company stock of publicly traded companies are available to those inside and outside of the organization, financial information and company stock of privately held companies are often limited exclusively to employees at a certain level within the organization as a part of compensation and incentive packages or selectively to individuals or groups (such as banks or other lenders) outside the organization.

Publicly Held versus Privately Held Companies By: Rice University OpenStax CC BY-NC-SA 4.0

Publicly Held Company	Privately Held Company
• Stock available to general public • Financial information public • Typically larger in value	• Stock not available to general public • Financial information private • Typically smaller in value

Whether the stock is owned by a publicly traded or privately held company, owners use financial information to make decisions. Owners use the financial information to assess the financial performance of the business and make decisions such as whether or not to purchase additional stock, sell existing stock, or maintain the current level of stock ownership.

Other decisions stockholders make may be influenced by the type of company. For example, stockholders of privately held companies often are also employees of the company, and the decisions they make may be related to day-to-day activities as well as longer-term strategic decisions. Owners of publicly traded companies, on the other hand, will usually only focus on strategic issues such as the company leadership, purchases of other businesses, and executive compensation arrangements. In essence, stockholders predominantly focus on profitability, expected increase in stock value, and corporate stability.

Creditors and Lenders

In order to provide goods and services to their customers, businesses make purchases from other businesses. These purchases come in the form of materials used to make finished goods or resell, office equipment such as copiers and telephones, utility services such as heating and cooling, and many other products and services that are vital to run the business efficiently and effectively.

It is rare that payment is required at the time of the purchase or when the service is provided. Instead, businesses usually extend "credit" to other businesses. Selling and purchasing on credit, means the payment is expected after a certain period of time following receipt of the goods or provision of the service. The term creditor refers to a business that grants extended payment terms to other businesses. The time frame for extended credit to other businesses for purchases of goods and

services is usually very short, typically thirty-day to forty-five-day periods are common.

When businesses need to borrow larger amounts of money and/or for longer periods of time, they will often borrow money from a lender, a bank or other institution that has the primary purpose of lending money with a specified repayment period and stated interest rate. If you or your family own a home, you may already be familiar with lending institutions. The time frame for borrowing from lenders is typically measured in years rather than days, as was the case with creditors. While lending arrangements vary, typically the borrower is required to make periodic, scheduled payments with the full amount being repaid by a certain date. In addition, since the borrowing is for a long period of time, lending institutions require the borrower to pay a fee (called interest) for the use of borrowing.

Creditor versus Lender. By: Rice University OpenStax CC BY-NC-SA 4.0

Creditor	Lender
• Business that grants extended payment terms to other businesses • Shorter time frame	• Bank or other institution that lends money • Longer time frame

Both creditors and lenders use financial information to make decisions. The ultimate decision that both creditors and lenders have to make is whether or not the funds will be repaid by the borrower. The reason this is important is because lending money involves risk. The type of risk creditors and lenders assess is repayment risk—the risk the funds will not be repaid. As a rule, the longer the money is borrowed, the higher the risk involved.

Recall that accounting information is historical in nature. While historical performance is no guarantee of future performance (repayment of borrowed funds, in this case), an

established pattern of financial performance using historical accounting information does help creditors and lenders to assess the likelihood the funds will be repaid, which, in turn, helps them to determine how much money to lend, how long to lend the money for, and how much interest (in the case of lenders) to charge the borrower.

Sources of Funding

Besides borrowing, there are other options for businesses to obtain or raise additional funding (also often labeled as capital). It is important for the business student to understand that businesses generally have three ways to raise capital: profitable operations is the first option; selling ownership—stock—which is also called equity financing, is the second option; and borrowing from lenders (called debt financing) is the final option.

You are already aware of the concept of profit. In short, profit means the inflows of resources are greater than the outflow of resources, or stated in more business-like terms, the revenues that the company generates are larger or greater than the expenses. For example, if a retailer buys a printer for $150 and sells it for $320, then from the sale it would have revenue of $320 and expenses of $150, for a profit of $170. (Actually, the process is a little more complicated because there would typically be other expenses for the operation of the store. However, to keep the example simple, those were not included. You'll learn more about this later in the course.)

Developing and maintaining profitable operations (selling goods and services) typically provides businesses with resources to use for future projects such as hiring additional workers, maintaining equipment, or expanding a warehouse. While profitable operations are valuable to businesses, companies often want to engage in projects that are very

expensive and/or are time sensitive. Businesses, then, have other options to raise funds quickly, such as selling stock and borrowing from lenders, as previously discussed.

An advantage of selling stock to raise capital is that the business is not committed to a specific payback schedule. A disadvantage of issuing new stock is that the administrative costs (legal and compliance) are high, which makes it an expensive way to raise capital.

There are two advantages to raising money by borrowing from lenders. One advantage is that the process, relative to profitable operations and selling ownership, is quicker. As you've learned, lenders (and creditors) review financial information provided by the business in order to make assessments on whether or not to lend money to the business, how much money to lend, and the acceptable length of time to lend. A second, and related, advantage of raising capital through borrowing is that it is fairly inexpensive. A disadvantage of borrowing money from lenders is the repayment commitments. Because lenders require the funds to be repaid within a specific time frame, the risk to the business (and, in turn, to the lender) increases.

These topics are covered extensively in the area of study called corporate finance. While finance and accounting are similar in many aspects, in practicality finance and accounting are separate disciplines that frequently work in coordination in a business setting. Students may be interested to learn more about the educational and career options in the field of corporate finance. Because there are many similarities in the study of finance and accounting, many college students double major in a combination of finance, accounting, economics, and information systems.

CONCEPTS IN PRACTICE

Profit

What is profit? In accounting, there is general consensus on the definition of profit. A typical definition of profit is, in effect, when inflows of cash or other resources are greater than outflows of resources.

Ken Blanchard provides another way to define profit. Blanchard is the author of *The One Minute Manager*, a popular leadership book published in 1982. He is often quoted as saying, "profit is the applause you get for taking care of your customers and creating a motivating environment for your people [employees]." Blanchard's definition recognizes the multidimensional aspect of profit, which requires successful businesses to focus on their customers, employees, and the community.

Check out this short video review of Blanchard's "One Minute Manager".

Governmental and Regulatory Agencies

Publicly traded companies are required to file financial and other informational reports with the Securities and Exchange Commission (SEC), a federal regulatory agency that regulates corporations with shares listed and traded on security exchanges through required periodic filings SEC website. The SEC accomplishes this in two primary ways: issuing regulations and providing oversight of financial markets. The goal of these

actions is to help ensure that businesses provide investors with access to transparent and unbiased financial information.



Securities and Exchange Commission seal [Wikimedia Public Domain]

The SEC is responsible for establishing guidelines for the accounting profession. These are called accounting standards or generally accepted accounting principles (GAAP). Although the SEC also had the responsibility of issuing standards for the auditing profession, they relinquished this responsibility to the Financial Accounting Standards Board (FASB).

The SEC also has responsibility for regulating firms that issue and trade (buy and sell) securities—stocks, bonds, and other investment instruments.

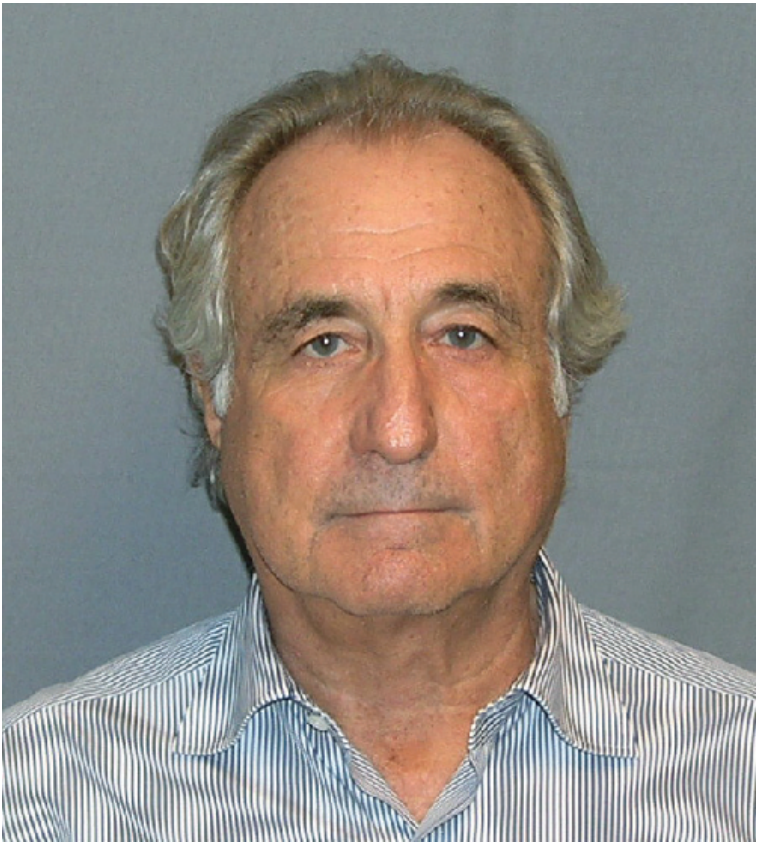
Enforcement by the SEC takes many forms. According to the SEC website, "Each year the SEC brings hundreds of civil enforcement actions against individuals and companies for

violation of the securities laws. Typical infractions include insider trading, accounting fraud, and providing false or misleading information about securities and the companies that issue them."[3] Financial information is a valuable tool that is part of the investigatory and enforcement activities of the SEC.

CONCEPTS IN PRACTICE

Financial Professionals and Fraud

You may have heard the name Bernard "Bernie" Madoff. Madoff (image below) was the founder of an investment firm, **Bernard L. Madoff Investment Securities**. The original mission of the firm was to provide financial advice and investment services to clients. This is a valuable service to many people because of the complexity of financial investments and retirement planning. Many people rely on financial professionals, like Bernie Madoff, to help them create wealth and be in a position to retire comfortably. Unfortunately, Madoff took advantage of the trust of his investors and was ultimately convicted of stealing (embezzling) over $50 billion (a low amount by some estimates). Madoff's embezzlement remains one of the biggest financial frauds in US history.



Bernard Madoff's mugshot upon his arrest in March 2009. By US Dept. of Justice Wikimedia Public Domain

The fraud scheme was initially uncovered by a financial analyst named Harry Markopolos. Markopolos became suspicious because Madoff's firm purported to achieve for its investors abnormally high rates of return for an extended period of time. After analyzing the investment returns, Markopolos reported the suspicious activity to the Securities and Exchange Commission (SEC), which has enforcement responsibility for firms providing investment services. While Madoff was initially

able to stay a few steps ahead of the SEC, he was charged in 2009 and will spend the rest of his life in prison.

There are many resources to explore the Madoff scandal. You might be interested in reading the book, *No One Would Listen: A True Financial Thriller*, written by Harry Markopolos. A movie and a TV series have also been made about the Madoff scandal.

In addition to governmental and regulatory agencies at the federal level, many state and local agencies use financial information to accomplish the mission of protecting the public interest. The primary goals are to ensure the financial information is prepared according to the relevant rules or practices as well as to ensure funds are being used in an efficient and transparent manner. For example, local school district administrators should ensure that financial information is available to the residents and is presented in an unbiased manner. The residents want to know their tax dollars are not being wasted. Likewise, the school district administrators want to demonstrate they are using the funding in an efficient and effective manner. This helps ensure a good relationship with the community that fosters trust and support for the school system.

Customers

Depending on the perspective, the term *customers* can have different meanings. Consider for a moment a retail store that sells electronics. That business has customers that purchase its electronics. These customers are considered the end users of the product. The customers, knowingly or unknowingly, have a stake in the financial performance of the business. The customers benefit when the business is financially successful. Profitable businesses will continue to sell the products the customers want, maintain and improve the business facilities,

provide employment for community members, and undertake many other activities that contribute to a vibrant and thriving community.

Businesses are also customers. In the example of the electronics store, the business purchases its products from other businesses, including the manufacturers of the electronics. Just as end-user customers have a vested interest in the financial success of the business, business customers also benefit from suppliers that have financial success. A supplier that is financially successful will help ensure the electronics will continue to be available to purchase and resell to the end-use customer, investments in emerging technologies will be made, and improvements in delivery and customer service will result. This, in turn, helps the retail electronics store remain cost competitive while being able to offer its customers a wide variety of products.

Managers and Other Employees

Employees have a strong interest in the financial performance of the organizations for which they work. At the most basic level, employees want to know their jobs will be secure so they can continue to be paid for their work. In addition, employees increase their value to the organization through their years of service, improving knowledge and skills, and accepting positions of increased responsibility. An organization that is financially successful is able to reward employees for that commitment to the organization through bonuses and increased pay.

In addition to promotional and compensation considerations, managers and others in the organization have the responsibility to make day-to-day and long-term (strategic) decisions for the organization. Understanding financial information is vital to making good organizational decisions.

Not all decisions, however, are based on strictly financial information. Recall that managers and other decision makers often use nonfinancial, or managerial, information. These decisions take into account other relevant factors that may not have an immediate and direct link to the financial reports. It is important to understand that sound organizational decisions are often (and should be) based on both financial and nonfinancial information.

In addition to exploring managerial accounting concepts, you will also learn some of the common techniques that are used to analyze the financial reports of businesses.

Footnotes

- 2 B. Wansink and J. Sobal. "Mindless Eating: The 200 Daily Food Decisions We Overlook." 2007. *Environment & Behavior*, 39[1], 106–123.
- 3 U.S. Securities and Exchange Commission. "What We Do." June 10, 2013. https://www.sec.gov/Article/whatwedo.html

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Careers in Accounting

There are often misunderstandings on what exactly accountants do or what attributes are necessary for a successful career in accounting. Often, people perceive accountants as “number-crunchers” or “bean counters” who sit behind a desk, working with numbers, and having little interaction with others. The fact is that this perception could not be further from the truth.

Personal Attributes

While it is true that accountants often work independently, much of the work that accountants undertake involves interactions with other people. In fact, accountants frequently need to gather information from others and explain complex financial concepts to others, making excellent written and verbal communication skills a must. In addition, accountants often deal with strict deadlines such as tax filings, making prioritizing work commitments and being goal oriented necessities. In addition to these skills, traditionally, an accountant can be described as someone who

- is goal oriented,
- is a problem solver,
- is organized and analytical,
- has good interpersonal skills,
- pays attention to detail,
- has good time-management skills, and
- is outgoing.

The Association of Chartered Certified Accountants (ACCA

website), the governing body of the global Chartered Certified Accountant (CCA) designation, and the Institute of Management Accountants (IMA website), the governing body of the Certified Management Accountant (CMA website) designation, conducted a study to research the skills accountants will need given a changing economic and technological context. The findings indicate that, in addition to the traditional personal attributes, accountants should possess "traits such as entrepreneurship, curiosity, creativity, and strategic thinking."[4]

Education

Entry-level positions in the accounting profession usually require a minimum of a bachelor's degree. For advanced positions, firms may consider factors such as years of experience, professional development, certifications, and advanced degrees, such as a master's or doctorate. The specific factors regarding educational requirements depend on the industry and the specific business.

After earning a bachelor's degree, many students decide to continue their education by earning a master's degree. A common question for students is when to begin a master's program, either entering a master's program immediately after earning a bachelor's degree or first entering the profession and pursuing a master's at a later point. On one hand, there are benefits of entering into a master's program immediately after earning a bachelor's degree, mainly that students are already into the rhythm of being a full-time student so an additional year or so in a master's program is appealing. On the other hand, entering the profession directly after earning a bachelor's degree allows the student to gain valuable professional experience that may enrich the graduate education experience. When to enter a graduate program is not an easy

decision. There are pros and cons to either position. In essence, the final decision depends on the personal perspective and alternatives available to the individual student. For example, one student might not have the financial resources to continue immediately on to graduate school and will first need to work to fund additional education, while another student might have outside suppliers of resources or is considering taking on additional student loan debt. The best recommendation for these students is to consider all of the factors and realize that they must make the final decision as to their own best alternative. It is also important to note that if one makes the decision to enter public accounting, as all states require 150 hours of education to earn a Certified Public Accountant (CPA) license, it is customary for regional and national public accounting firms to require a master's degree or 150 hours earned by other means as a condition for employment; this may influence your decision to enter a master's degree program as soon as the bachelor's degree is complete.

Related Careers

An accounting degree is a valuable tool for other professions too. A thorough understanding of accounting provides the student with a comprehensive understanding of business activity and the importance of financial information to make informed decisions. While an accounting degree is a necessity to work in the accounting profession, it also provides a solid foundation for other careers, such as financial analysts, personal financial planners, and business executives. The number of career options may seem overwhelming at this point, and a career in the accounting profession is no exception. The purpose of this section is to simply highlight the vast number of options that an accounting degree offers. In the

workforce, accounting professionals can find a career that best fits their interests.

Students may also be interested in learning more about professional certifications in the areas of financial analysis (Chartered Financial Analyst; CFA website) and personal financial planning (Certified Financial Planner; CFP website), which are discussed later in this section.

Major Categories of Accounting Functions

It is a common perception that an accounting career means preparing tax returns. While numerous accountants do prepare tax returns, many people are surprised to learn of the variety of career paths that are available within the accounting profession. An accounting degree is a valuable tool that gives accountants a high level of flexibility and many options. Often individual accountants apply skills in several of the following career paths simultaneously. The following figure illustrates some of the many career paths open to accounting students.



***Career Paths**. There are many career paths open to students of accounting. By Rice University. Openstax CC BY-NC-SA*

Auditing

Auditing, which is performed by accountants with a specialized skill set, is the process of ensuring activities are carried out as intended or designed. There are many examples of the functions that auditors perform. For example, in a manufacturing company, auditors may sample products and assess whether or not the products conform to the customer specifications. As another example, county auditors may test pumps at gas stations to ensure the pumps are delivering the correct amount of gasoline and charging customers correctly.

Companies should develop policies and procedures to help ensure the company's goals are being met and the assets are protected. This is called the internal control system. To help maintain the effectiveness of the internal control system,

companies often hire internal auditors, who evaluate internal controls through reviews and tests. For example, internal auditors may review the process of how cash is handled within a business. In this scenario, the goal of the company is to ensure that all cash payments are properly applied to customer accounts and that all funds are properly deposited into the company's bank account. As another example, internal auditors may review the shipping and receiving process to ensure that all products shipped or received have the proper paperwork and the product is handled and stored properly. While internal auditors also often work to ensure compliance with external regulations, the primary goal of internal auditors is to help ensure the company policies are followed, which helps the company attain its strategic goals and protect its assets. The professional certification most relevant to a career in internal audit is the Certified Internal Auditor (CIA). Financial fraud occurs when an individual or individuals act with intent to deceive for a financial gain. A Certified Fraud Examiner (CFE) is trained to prevent fraud from occurring and to detect when fraud has occurred.

Companies also want to ensure the financial statements provided to outside parties such as banks, governmental agencies, and the investing public are reliable and consistent. That is, companies have a desire to provide financial statements that are free of errors or fraud. Since internal auditors are committed to providing unbiased financial information, it would be possible for the company to use internal auditors to attest to the integrity of the company's financial statements. With that said, doing so presents the appearance of a *possibility* of a conflict of interest and could call into question the validity of the financial statements. Therefore, companies hire external auditors to review and attest to the integrity of the financial statements. External auditors typically work for a public accounting firm. Although the public accounting firm is hired by the company to attest

to the fairness of the financial statements, the external auditors are independent of the company and provide an unbiased opinion.

Taxation

There are many taxes that businesses are required to pay. Examples include income taxes, payroll and related taxes such as workers' compensation and unemployment, property and inventory taxes, and sales and use taxes. In addition to making the tax payments, many of the taxes require tax returns and other paperwork to be completed. Making things even more complicated is the fact that taxes are levied at the federal, state, and local levels. For larger worldwide companies, the work needed to meet their international tax compliance requirements can take literally thousands of hours of accountants' time. To sum up the process, the goal of tax accountants is to help ensure the taxes are paid properly and in a timely manner, from an individual level all the way to the company level (including at the level of such companies as **Apple** and **Walmart**).

Since accountants have an understanding of various tax laws and filing deadlines, they are also well-positioned to offer tax planning advice. Tax laws are complex and change frequently; therefore, it is helpful for businesses to include tax considerations in their short- and long-term planning. Accountants are a valuable resource in helping businesses minimize the tax liability.

Many businesses find it necessary to employ accountants to work on tax compliance and planning on a full-time basis. Other businesses need these services on a periodic (quarterly or annual) basis and hire external accountants accordingly.

Financial Accounting

Financial accounting measures, in dollars, the activities of an organization. Financial accounting is historical in nature and is prepared using standard conventions, called accounting standards or GAAP. Because nearly every activity in an organization has a financial implication, financial accounting might be thought of as a "monetary scorecard."

Financial accounting is used internally by managers and other decision makers to validate activities that were done well and to highlight areas that need adjusted in the future. Businesses often use discretion as to how much and with whom financial accounting information is shared.

Financial accounting is also provided to those outside the organization. For a publicly traded company, issuing financial statements is required by the SEC. Sharing financial information for a privately held company is usually reserved for those instances where the information is required, such as for audits or obtaining loans.

Consulting

Because nearly every activity within an organization has a financial implication, accountants have a unique opportunity to gain a comprehensive view of an organization. Accountants are able to see how one area of a business affects a different aspect of the business. As accountants gain experience in the profession, this unique perspective allows them to build a "knowledge database" that is valuable to businesses. In this capacity, accountants can provide consulting services, which means giving advice or guidance to managers and other decision makers on the impact (both financial and nonfinancial) of a potential course of action. This role allows the

organization to gain knowledge from the accountants in a way that minimizes risk and/or financial investment.

As discussed previously, accountants may advise a business on tax-related issues. Other examples of consultative services that accountants perform include selection and installation of computer software applications and other technology considerations, review of internal controls, determination of compliance with relevant laws and regulations, review of compensation and incentive arrangements, and consideration of operational efficiencies within the production process.

Accounting Information Services

Computers are an integral part of business. Computers and related software programs allow companies to efficiently record, store, and process valuable data and information relevant to the business. Accountants are often an integral part of the selection and maintenance of the company's computerized accounting and information system. The goal of the accounting information system is to efficiently provide relevant information to internal decision makers, and it is important for businesses to stay abreast of advances in technology and invest in those technologies that help the business remain efficient and competitive.

Significant growth is expected in accounting information systems careers. According to the US Bureau of Labor Statistics, in 2010 there were over 130,000 jobs in the accounting informations systems sector, with over 49% growth expected through 2024. Median earnings in this field were over $73,000 in 2011.[5] For those interested in both accounting and computer information systems, there are tremendous career opportunities.

CONCEPTS IN PRACTICE

Enterprise Resource Planning

As companies grow in size and expand geographically, it is important to assess whether or not a current computerized system is *the right size and fit* for the organization. For example, a company with a single location can easily manage its business activities with a small, off-the-shelf software package such as **QuickBooks** and software applications such as **Microsoft** Excel. A company's computer system becomes more complex when additional locations are added.



Growth By geralt. Pixabay Public domain

As companies continue to grow, larger integrated computer systems, called enterprise resource planning (ERP) systems, may be implemented. Enterprise resource planning systems are designed to maintain the various aspects of the business within a single integrated computer system. For example, a

leading ERP system is **Microsoft** Dynamics GP. **Microsoft** Dynamics GP is an integrated sytem with the capability to handle the human resource management, production, accounting, manufacturing, and many other aspects of a business. ERP systems, like **Microsoft** Dynamics GP, are also designed to accommodate companies that have international locations. The benefit of ERP systems is that information is efficiently stored and utilized across the entire business in real time.

Cost and Managerial Accounting

Cost accounting and managerial accounting are related, but different, types of accounting. In essence, a primary distinction between the two functions is that cost accounting takes a primarily quantitative approach, whereas managerial accounting takes both quantitative and qualitative approaches. The goal of cost accounting is to determine the costs involved with providing goods and services. In a manufacturing business, cost accounting is the recording and tracking of costs such as direct materials, employee wages, and supplies used in the manufacturing process.

Managerial accounting uses cost accounting and other financial accounting information, as well as nonfinancial information, to make short-term as well as strategic and other long-term decisions for a business.

Both cost and managerial accounting are intended to be used inside a business. Along with financial accounting information, managers and other decision makers within a business use the information to facilitate decision-making, develop long-term plans, and perform other functions necessary for the success of the business.

There are two major differences between cost and managerial accounting and financial accounting. Whereas financial accounting requires the use of standard accounting conventions (also called accounting standards or GAAP), there are no such requirements for cost and managerial accounting. In practice, management has different needs that require cost and managerial accounting information. In addition, financial information is prepared in specific intervals of time, usually monthly. The same is not true with cost and managerial accounting, which are prepared on an as-needed basis that is not reported as specific periods of time.

An example may be helpful in clarifying the difference between cost and managerial accounting. Manufacturing companies often face the decision of whether to make certain components or purchase the components from an outside supplier. Cost accounting would calculate the cost of each alternative. Managerial accounting would use that cost and supplement the cost with nonfinancial information to arrive at a decision. Let's say the cost accountants determine that a company would save $0.50 per component if the units were purchased from an outside supplier rather than being produced by the company. Managers would use the $0.50 per piece savings as well as nonfinancial considerations, such as the impact on the morale of current employees and the supplier's ability to produce a quality product, to make a decision whether or not to purchase the component from the outside supplier.

In summary, it may be helpful to think of cost accounting as a subset of managerial accounting. Another way to think about cost and managerial accounting is that the result of cost accounting is a number, whereas the result of managerial accounting is a decision.

Financial Planning

While accountants spend much of their time interacting with other people, a large component of their work involves numbers and finances. As mentioned previously, many people with an interest in data often go into the accounting profession and have a natural inclination toward solving problems. In addition, accountants also gain a comprehensive view of business. They understand how the diverse aspects of the business are connected and how those activities ultimately have a financial impact on the organization.

These attributes allow accountants to offer expertise in financial planning, which takes many forms. Within a business, making estimates and establishing a plan for the future—called a budget—are vital. These actions allow the business to determine the appropriate level of activity and make any adjustments accordingly. Training in accounting is also helpful for those who offer financial planning for individuals. When it comes to investing and saving for the future, there are many options available to individuals. Investing is complicated, and many people want help from someone who understands the complexities of the investment options, the tax implications, and ways to invest and build wealth. Accountants are well trained to offer financial planning services to the businesses they work with as well as individuals investing for their future.

Entrepreneurship

Many people have an idea for a product or service and decide to start their own business—they are often labeled as entrepreneurs. These individuals have a passion for their product or service and are experts at what they do. But that

is not enough. In order for the business to be successful, the entrepreneur must understand all aspects of the business, including and especially the financial aspect. It is important for the entrepreneur to understand how to obtain the funding to start the business, measure the financial performance of the business, and know what adjustments to improve the performance of the business are necessary and when to make them. Understanding accounting, or hiring accountants who can perform these activities, is valuable to the entrepreneur. An entrepreneur works extremely hard and has often taken a great risk in starting his or her own business. Understanding the financial performance of the business helps ensure the business is successful.

CONCEPTS IN PRACTICE

Entrepreneurship

Entrepreneurs do not have to develop a brand new product or service in order to open their own business. Often entrepreneurs decide to purchase a store from a business that already exists. This is called a franchise arrangement. In these arrangements, the business owner (the franchisee) typically pays the franchisor (the business offering the franchise opportunity) a lump sum at the beginning of the arrangement. This lump sum payment allows the franchisee an opportunity to use the store logos and receive training, consulting, and other support from the franchisor. A series of scheduled payments is also common. The ongoing payments are often based on a percentage of the franchise store's sales.

The franchise arrangement is beneficial to both parties. For the franchisee, there is less risk involved because they often

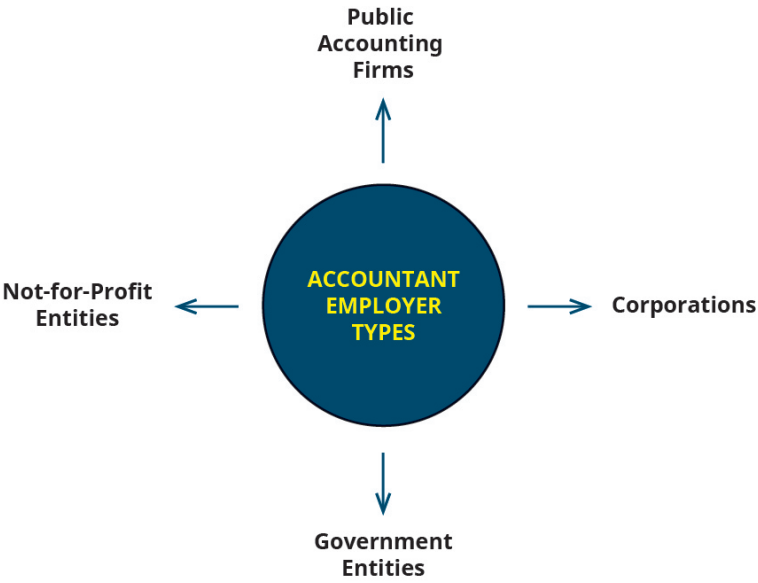
purchase a franchise from a business with an established track record of success. For the franchisor, it is an opportunity to build the brand without the responsibility of direct oversight for individual stores—each franchise is independently owned and operated (a phrase you might see on franchise stores).

The downside of the franchising arrangement is the amount of money that is paid to the franchisor through the initial lump sum as well as continued payments. These costs, however, are necessary for the ongoing support from the franchisor. In addition, franchisees often have restrictions relative to product pricing and offerings, geographic locations, and approved suppliers.

According to Entrepreneur.com, based on factors such as costs and fees, support, and brand strength, the number one–ranking franchise in 2017 was **7-Eleven, Inc.** According to the website, **7-Eleven** has been franchising since 1964 and has 61,086 franchise stores worldwide (7,025 are located in the United States). In addition, **7-Eleven** has 1,019 company-owned stores.[6]

Major Categories of Employers

Now that you've learned about the various career paths that accountants can take, let's briefly look at the types of organizations that accountants can work for. This figure illustrates some common types of employers that require accountants. While this is not an all-inclusive list, most accountants in the profession are employed by these types of organizations.



Accountant Employer Types. Accountants may find employment within a variety of types of entities. By Rice University. Source CC BY-NC-SA

Public Accounting Firms

Public accounting firms offer a wide range of accounting, auditing, consulting, and tax preparation services to their clients. A small business might use a public accounting firm to prepare the monthly or quarterly financial statements and/or the payroll. A business (of any size) might hire the public accounting firm to audit the company financial statements or verify that policies and procedures are being followed properly. Public accounting firms may also offer consulting services to their clients to advise them on implementing computerized systems or strengthening the internal control system. (Note that you will learn in your advanced study of accounting that accountants have legal limitations on what consulting services

they can provide to their clients.) Public accounting firms also offer tax preparation services for their business and individual clients. Public accounting firms may also offer business valuation, forensic accounting (financial crimes), and other services.

Public accounting firms are often categorized based on the size (revenue). The biggest firms are referred to as the "Big Four" and include **Deloitte Touche Tohmatsu Limited** (DTTL), **PricewaterhouseCoopers** (PwC), **Ernst & Young** (EY), and **KPMG**. Following the Big Four in size are firms such as **RSM US**, **Grant Thornton**, **BDO USA**, **Crowe**, and **CliftonLarsonAllen (CLA)**.[7] There are also many other regional and local public accounting firms.

Public accounting firms often expect the accountants they employ to have earned (or will earn) the Certified Public Accountant (CPA) designation. It is not uncommon for public accounting firms to specialize. For example, some public accounting firms may specialize in serving clients in the banking or aerospace industries. In addition to specializing in specific industries, public accounting firms may also specialize in areas of accounting such as tax compliance and planning.

Hiring public accounting firms to perform various services is an attractive option for many businesses. The primary benefit is that the business has access to experts in the profession without needing to hire accounting specialists on a full-time basis.

Corporations

Corporations hire accountants to perform various functions within the business. The primary responsibility of corporate accountants (which include cost and managerial accountants) is to provide information for internal users and decision makers, as well as implement and monitor internal controls. The

information provided by corporate accountants takes many forms. For example, some of the common responsibilities of corporate accountants include calculating and tracking the costs of providing goods and services, analyzing the financial performance of the business in comparison to expectations, and developing budgets, which help the company plan for future operations and make any necessary adjustments. In addition, many corporate accountants have the responsibility for or help with the company's payroll and computer network.

In smaller corporations, an accountant may be responsible for or assist with several of these activities. In larger firms, however, accountants may specialize in one of the areas of responsibilities and may rotate responsibilities throughout their career. Many larger firms also use accountants as part of the internal audit function. In addition, many large companies are able to dedicate resources to making the organization more efficient. Programs such as Lean Manufacturing and Six Sigma focus on reducing waste and eliminating cost within the organization. Accountants trained in these techniques receive specialized training that focuses on the cost impact of the activities of the business.

As with many organizations, professional certifications are highly valued in corporations. The primary certification for corporate accounting is the Certified Management Accountant (CMA). Because corporations also undertake financial reporting and related activities, such as tax compliance, corporations often hire CPAs.

Governmental Entities

Accountants in governmental entities perform many of the same functions as accountants in public accounting firms and corporations. The primary goal of governmental accounting is to ensure proper tracking of the inflows and outflows of

taxpayer funds using the proscribed standards. Some governmental accountants also prepare and may also audit the work of other governmental agencies to ensure the funds are properly accounted for. The major difference between accountants in governmental entities and accountants working in public accounting firms and corporations relates to the specific rules by which the financial reporting must be prepared. Whereas as accountants in public accounting firms and corporations use GAAP, governmental accounting is prepared under a different set of rules that are specific to governmental agencies, as previously referred to as the Governmental Accounting Standards Board (GASB). Students continuing their study of accounting may take specific courses related to governmental accounting.

Accountants in the governmental sector may also work in specialized areas. For example, many accountants work for tax agencies at the federal, state, and local levels to ensure the tax returns prepared by businesses and individuals comply with the tax code appropriate for the particular jurisdiction. As another example, accountants employed by the SEC may investigate instances where financial crimes occur, as in the case of Bernie Madoff, previously discussed.

CONCEPTS IN PRACTICE

Bringing Down Capone

Al Capone was one of the most notorious criminals in American history. Born in 1899 in Brooklyn, New York, Al Capone rose to fame as a gangster in Chicago during the era of Prohibition. By the late 1920s–1930s, Capone controlled a syndicate with a reported annual income of $100 million.

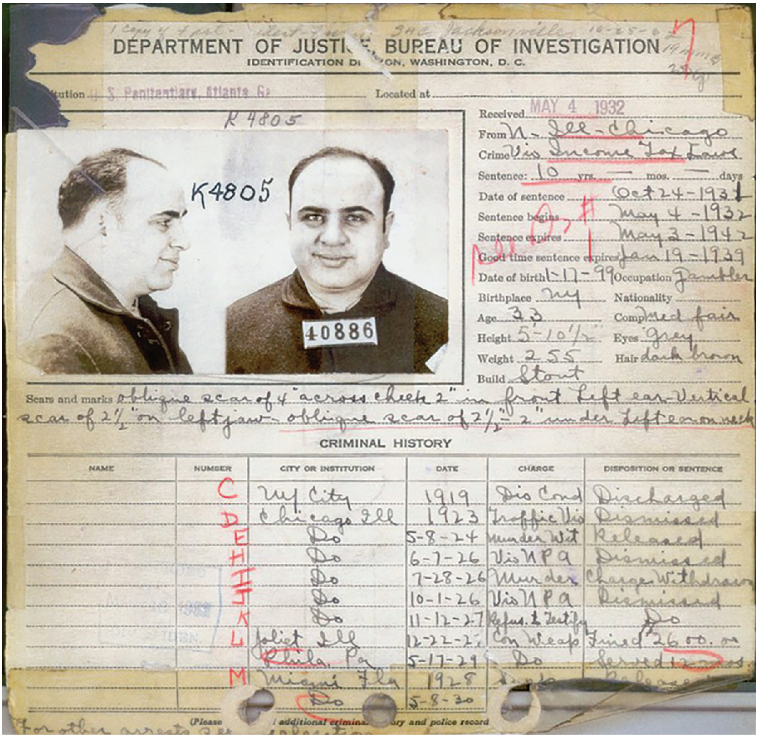
Al Capone was credited for many murders, including

masterminding the famous 1929 St. Valentine's Day murder, which killed seven rival gang members. But law enforcement was unable to convict Capone for the murders he committed or orchestrated. Through bribes and extortion, Capone was able to evade severe punishment, being charged at one point with gun possession and serving a year in jail.

Capone's luck ran out in 1931 when he was convicted of federal tax evasion. In 1927, the United States Supreme Court ruled that earnings from illegal activities were taxable. Capone, however, did not claim the illegal earnings on his 1928 and 1929 income tax returns and was subsequently sentenced to eleven years in prison. Up to that point, it was the longest-ever sentence for tax evasion.

Al Capone was paroled from prison in November 1939 and died on January 25, 1947. His life has been the subject of many articles, books, movies including *Scarface* (1932), and the TV series *The Untouchables* (1993).

Those interested in stories like this might consider working for the Federal Bureau of Investigation (FBI). According to the FBI, as of 2012, approximately 15% of FBI agents are special agent accountants.



Al Capone. The FBI's 1932 criminal record on Al Capone shows the many charges against him, most of which were dismissed. By FBI/ Federal Bureau of Investigation. FBI Public Domain

Not-for-Profit Entities

Not-for-profit entities include charitable organizations, foundations, and universities. Unlike for-profit entities, not-for-profit organizations have a primary focus of a particular mission. Therefore, not-for-profit (NFP) accounting helps ensure that donor funds are used for the intended mission.

Much like accountants in governmental entities, accountants in not-for-profit entities use a slightly different type of accounting than other types of businesses, with the primary difference being that not-for-profit entities typically do not pay income taxes.

However, even if a not-for-profit organization is not subjected to income taxes in a particular year, it generally must file informational returns, such as a Form 990, with the Internal Revenue Service (IRS). Information, such as sources and amounts of funding and major types and amounts of expenditures, is documented by the not-for-profit entities to provide information for potential and current donors. Once filed with the IRS, Form 990 is available for public view so that the public can monitor how the specific charity uses proceeds as well as its operational efficiency.

Potential Certifications for Accountants

As previously discussed, the study of accounting serves as a foundation for other careers that are similar to accounting, and the certifications described here reflect that relationship.

There are many benefits to attaining a professional certification (or multiple certifications) in addition to a college degree. Certifications often cover material at a deeper and more complex level than might typically be covered in a college program. Those earning a professional certification demonstrate their willingness to invest the additional time and energy into becoming experts in the particular field. Because of this, employees with professional certifications are often in higher demand and earn higher salaries than those without professional certifications. Companies also benefit by having employees with professional certifications. A well-trained staff with demonstrated expertise conveys a level of professionalism that gives the organization a competitive advantage. In

addition, professional certifications often require a certain number of hours of ongoing training. This helps ensure that the certificate holder remains informed as to the current advances within the profession and benefits both the employee and the employer.

Certifications are developed and governed by the respective governing body. Each issuing body establishes areas of content and requirements for the specific certification. Links to the particular websites are provided so you can easily gain additional information.

It is also important to note that many of the certifications have review courses available. The review courses help students prepare for the exam by offering test-taking strategies, practice questions and exams, and other materials that help students efficiently and effectively prepare for the exams.

Accounting Codes of Ethics

In the United States, accountants can obtain a number of different certifications and can be licensed by each state to practice as a Certified Public Accountant (CPA). Accountants can also belong to professional organizations that have their own codes of conduct. As the online Stanford Encyclopedia of Philosophy explains, "many people engaged in business activity, including accountants and lawyers, are professionals. As such, they are bound by codes of conduct promulgated by professional societies. Many firms also have detailed codes of conduct, developed and enforced by teams of ethics and compliance personnel."[8] CPAs can find a code of ethics in each state of practice and with the AICPA.[9] Certifications such as the CMA, CIA, CFE, CFA, and CFP each have their own codes of ethics.

To facilitate cross-border business activities and accounting,

an attempt has been made to set international standards. To this end, accounting standards organizations in more than 100 countries use the International Federation of Accountants' (IFAC) Code of Ethics for Professional Accountants."[10] When auditing a public company, CPAs may also have to follow a special code of ethics created by the Public Company Accounting Oversight Board (PCAOB), or when performing federal tax work, the US Treasury Department's Circular No. 230 code of ethics. These are just some examples of ethical codes that are covered in more detail in this course. Each area of accounting work has its own set of ethical rules, but they all require that a professional accountant perform his or her work with integrity.

Certified Public Accountant (CPA)

The Certified Public Accountant (CPA) designation is earned after passing a uniform exam issued by the American Institute of Certified Public Accountants (AICPA). While the exam is a uniform, nationally administered exam, each state issues and governs CPA licenses.

The CPA exam has four parts: Auditing and Attestation (AUD), Business Environment and Concepts (BEC), Financial Accounting and Reporting (FAR), and Regulation (REG). A score of at least 75% must be earned in order to earn the CPA designation.

Since each state determines the requirements for CPA licenses, students are encouraged to check the state board of accountancy for specific requirements. In Ohio, for example, candidates for the CPA exam must have 150 hours of college credit. Of those, thirty semester hours (or equivalent quarter hours) must be in accounting. Once the CPA designation is earned in Ohio, 120 hours of continuing education must be taken over a three-year period in order to maintain the

certification. The requirements for the Ohio CPA exam are similar to the requirements for other states. Even though states issue CPA licenses, a CPA will not lose the designation should he or she move to another state. Each state has mobility or reciprocity requirements that allow CPAs to transfer licensure from one state to another. Reciprocity requirements can be obtained by contacting the respective state board of accountancy.

The majority of states require 150 hours of college credit. Students often graduate with a bachelor's degree with approximately 120–130 credit hours. In order to reach the 150-hour requirement that specific states have, students have a couple of options. The extra hours can be earned either by taking additional classes in their undergraduate program or by entering a graduate program, earning a master's degree. Master's degrees that would be most beneficial in an accounting or related field would be a master of accountancy, master in taxation, or a master in analytics, which is rapidly increasing in demand.

Certified Management Accountant (CMA)

The Certified Management Accountant (CMA) exam is developed and administered by the Institute of Management Accountants (IMA). There are many benefits in earning the CMA designation, including career advancement and earnings potential. Management accountants, among other activities, prepare budgets, perform analysis of financial and operational variances, and determine the cost of providing goods and services. Earning a certification enables the management accountant to advance to management and executive positions within the organization.

The CMA exam has two parts: Financial Reporting, Planning, Performance, and Control (part 1) and Financial Decision-

Making (part 2). A score of at least 72% must be earned in order to earn the CMA designation. A minimum of a bachelor's degree is required to take the CMA exam. An accounting degree or a specific number of credit hours in accounting is not required in order to take the CMA exam. Once the CMA designation is earned, thirty hours of continuing education with two of the hours focusing on ethics must be taken annually in order to maintain the certification.

Certified Internal Auditor (CIA)

The Certified Internal Auditor (CIA) exam is developed and administered by the Institute of Internal Auditors (IIA). According to the IIA website, the four-part CIA exam tests "candidates' grasp of internal auditing's role in governance, risk, and control; conducting an audit engagement; business analysis and information technology; and business management skills."[11]

If a candidate does not have a bachelor's degree, eligibility to take the CIA is based on a combination of work experience and education experience. In order to earn the CIA designation, a passing score of 80% is required. After successful passage of the CIA exam, certificate holders are required to earn eighty hours of continuing education credit every two years.[12]

Certified Fraud Examiner (CFE)

The Certified Fraud Examiner (CFE) exam is developed and administered by the Association of Certified Fraud Examiners (ACFE). Eligibility to take the CFE is based on a points system based on education and work experience. Candidates with forty points may take the CFE exam, and official certification

is earned with fifty points or more. A bachelor's degree, for example, is worth forty points toward eligibility of the fifty-point requirement for the CFE certification. The CFE offers an attractive supplement for students interested in pursuing a career in accounting fraud detection. Students might also consider studying forensic accounting in college. These courses are often offered at the graduate level.

The CFE exam has four parts: Fraud Prevention and Deterrence, Financial Transactions and Fraud Schemes, Investigation, and Law. Candidates must earn a minimum score of 75%. Once the CFE is earned, certificate holders must annually complete at least twenty hours of continuing education. The CFE certification is valued in many organizations, including governmental agencies at the local, state, and federal levels.

Chartered Financial Analyst (CFA)

The Chartered Financial Analyst (CFA) certification is developed and administered by the CFA Institute. The CFA exam contains three levels (level I, level II, and level III), testing expertise in Investment Tools, Asset Classes, and Portfolio Management. Those with a bachelor's degree are eligible to take the CFA exam. In lieu of a bachelor's degree, work experience or a combination of work experience and education is considered satisfactory for eligibility to take the CFA exam. After taking the exam, candidates receive a "Pass" or "Did Not Pass" result. A passing score is determined by the CFA Institute once the examination has been administered. The passing score threshold is established after considering factors such as exam content and current best practices. After successful passage of all three levels of the CFA examination, chartered members must earn at least twenty hours annually of

continuing education, of which two hours must be in Standards, Ethics, and Regulations (SER).

Certified Financial Planner (CFP)

The Certified Financial Planner (CFP) certification is developed and administered by the Certified Financial Planner (CFP) Board of Standards. The CFP exam consists of 170 multiple-choice questions that are taken over two, three-hour sessions. There are several ways in which the eligibility requirements can be met in order to take the CFP exam, which students can explore using the CFP Board of Standards website. As with the Chartered Financial Analyst (CFA) exam, the CFP Board of Standards does not predetermine a passing score but establishes the pass/fail threshold through a deliberative evaluation process. Upon successful completion of the exam, CFPs must obtain thirty hours of continuing education every two years, with two of the hours focused on ethics.

Footnotes

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Comparing Financial & Managerial Accounting

Managerial and financial accounting are used by every business, and there are important differences in their reporting functions. Those differences are detailed in the table below.

Comparing Reports between Financial and Managerial Accounting. By: Rice University OpenStax CC BY-NC-SA 4.0

COMMUNICATION THROUGH REPORTING	FINANCIAL ACCOUNTING	MANAGERIAL ACCOUNTING
Users of reports	External users: stockholders, creditors, regulators	Internal users: managers, officers, and other employees
Types of reports	Financial statements: balance sheet, income statement, cashflow statement, etc.	Internal reports: job cost sheet, cost of goods manufactured, production cost report, etc.
Frequency of reports	Quarterly; annually	As frequently as needed
Purpose of reports	Helps those external users make decisions: credit terms, investment, and other decisions	Assists the internal users in the planning and control decisionmaking process
Focus of reports	Pertains to company as a whole Uses GAAP structure Composed from a multitude or combination of other more individual data	Pertains to departments, sections of the business Very detailed reporting No GAAP constraints
Nature of reports	Monetary	Monetary and nonmonetary information
Verification of reports	Audited by CPA	No independent audits

Users of Reports

The information generated from the reports of financial accountants tends to be used primarily by external users, including the creditors, tax authorities and regulators, investors, customers, competitors, and others outside the

company, who rely on the financial statements and annual reports to access information about a company in order to make more informed decisions. Since these external people do not have access to the documents and records used to produce the financial statements, they depend on Generally Applied Accounting Principles (GAAP). These outside users also depend greatly on the preparation of audits that are done by public accounting firms, under the guidelines and standards of either the American Institute of Certified Public Accountants (AICPA), the US Securities and Exchange Commission (SEC), or the Public Company Accounting Oversight Board (PCAOB).

Managerial accounting information is gathered and reported for a more specific purpose for internal users, those inside the company or organization who are responsible for managing the company's business interests and executing decisions. These internal users may include management at all levels in all departments, owners, and other employees. For example, in the budget development process, a company such as **Tesla** may want to project the costs of producing a new line of automobiles. The managerial accountants could create a budget to estimate the costs, such as parts and labor, and after the manufacturing process has begun, they can measure the actual costs, thus determining if they are over or under their budgeted amounts. Although outside parties might be interested in this information, companies like **Tesla**, **Microsoft**, and **Boeing** spend significant amounts of time and money to keep their proprietary information secret. Therefore, these internal budget reports are only available to the appropriate users. While you can find a cost of goods sold schedule in the financial statements of publicly traded companies, it is difficult for outside parties to break it down in order to identify the individual costs of products and services.

Types of Reports

Financial accounting information is communicated through reporting, such as the financial statements. The financial statements typically include a balance sheet, income statement, cash flow statement, retained earnings statement, and footnotes. Managerial accounting information is communicated through reporting as well. However, the reports are more detailed and more specific and can be customized. One example of a managerial accounting report is a budget analysis (variance report) as shown in the table below. Other reports can include cost of goods manufactured, job order cost sheets, and production reports. Since managerial accounting is not governed by GAAP or other constraints, it is important for the creator of the reports to disclose all assumptions used to make the report. Since the reports are used internally, and not typically released to the general public, the presentation of any assumptions does not have to follow any industry-wide guidelines. Each organization is free to structure its reports in the format that organizes its information in the best way for it.

Example of a Budget (Variance) Analysis. By: Rice University OpenStax CC BY-NC-SA 4.0

Categories	Actual	Budgeted	Variance
Sales	$ 500,000	$ 490,000	$ 10,000
Cost of Goods Sold	(320,000)	(290,000)	(30,000)
Gross Margin	180,000	200,000	(20,000)
Selling & Administrative Expenses	(75,000)	(90,000)	15,000
Net Income	105,000	110,000	(5,000)

This type of analysis helps management to evaluate how effective they were at carrying out the plans and meeting the

goals of the corporation. You will see many examples of reports and analyses that can be used as tools to help management make decisions.

Frequency of Reports

The financial statements are typically generated quarterly and annually, although some entities also require monthly statements. Much work is involved in creating the financial statements, and any adjustments to accounts must be made before the statements can be produced. A physical count inventory must be done to adjust the inventory and cost of goods sold accounts, depreciation must be calculated and entered, all prepaid asset accounts must be reviewed for adjustments, and so forth. The annual reports are not finalized for several weeks after the year-end, because they are based on historical data; for a company that is traded on one of the major or regional stock exchanges, it must have an audit of the financial statements conducted by an independent certified public accountant. This audit cannot be completed until after the end of the company's fiscal year, because the auditors need access to all of the information for the company for that year. For companies that are privately held, an audit is not normally required. However, potential lenders might require an independent audit.

Conversely, managers can quickly attain managerial accounting information. No external, independent auditors are needed, and it is not necessary to wait until the year-end. Projections and estimates are adequate. Managers should understand that in order to obtain information quickly, they must accept less precision in the reporting. While there are several reports that are created on a regular basis (e.g., budgets and variance reports), many management reports are produced on an as-needed basis.

Purpose of Reports

The general purpose of financial statement reporting is to provide information about the results of operations, financial position, and cash flows of an organization. This data is useful to a wide range of users in order to make economic decisions. The purpose of the reporting done by management accountants is more specific to internal users. Management accountants make available the information that could assist companies in increasing their performance and profitability. Unlike financial reports, management reporting centers on components of the business. By dividing the business into smaller sections, a company is able to get into the details and analyze the smallest segments of the business.

An understanding of managerial accounting will assist anyone in the business world in determining and understanding product costs, analyzing break-even points, and budgeting for expenses and future growth (which will be covered in other parts of this course). As a manager, chief executive officer, or owner, you need to have information available at hand to answer these types of questions:

- Are my profits higher this quarter over last quarter?
- Do I have enough cash flow to pay my employees?
- Are my jobs priced correctly?
- Are my products priced correctly in order for me to make the profit I need to make?
- Who are my most productive and least productive employees?

In the world of business, information is power; stated simply, the more you know, typically, the better your decisions can be. Managerial accounting delivers data-driven feedback for these decisions that can assist in improving decision-making over the long term. Business managers can leverage this powerful

tool in order to make their businesses more successful, because management accounting adds value to common business decision-making. All of this readily available information can lead to great improvements for any business.

Focus of Reports

Because financial accounting typically focuses on the company as a whole, external users of this information choose to invest or loan money to the entire company, not to a department or division within the company. Therefore, the global focus of financial accounting is understandable.

However, the focus of management accounting is typically different. Managerial reporting is more focused on divisions, departments, or any component of a business, down to individuals. The mid-level and lower-level managers are typically responsible for smaller subsets within the company.

Managers need accounting reports that deal specifically with their division and their specific activities. For instance, production managers are responsible for their specific area and the results within their division. Accordingly, these production managers need information about results achieved in their division, as well as individual results of departments within the division. The company can be broken into segments based on what managers need—for example, geographic location, product line, customer demographics (e.g., gender, age, race), or any of a variety of other divisions.

Nature of Reports

Both financial reports and managerial reports use monetary accounting information, or information relating to money or

currency. Financial reports use data from the accounting system that is gathered from the reporting of transactions in the form of journal entries and then aggregated into financial statements. This information is monetary in nature. Managerial accounting uses some of the same financial information as financial accounting, but much of that information will be broken down to a more detailed level. For example, in financial reporting, net sales are needed for the income statement. In managerial accounting, the quantity and dollar value of the sales of each product are likely more useful. In addition, managerial accounting uses a significant amount of nonmonetary accounting information, such as quantity of material, number of employees, number of hours worked, and so forth, which does not relate to money or currency.

Verification of Reports

Financial reports rely on structure. They are generated using accepted principles that are enforced through a vast set of rules and guidelines, also known as GAAP. As mentioned previously, companies that are publicly traded are required to have their financial statements audited on an annual basis, and companies that are not publicly traded also may be required to have their financial statements audited by their creditors. The information generated by the management accountants is intended for internal use by the company's divisions, departments, or both. There are no rules, guidelines, or principles to follow. Managerial accounting is much more flexible, so the design of the managerial accounting system is difficult to standardize, and standardization is unnecessary. It depends on the nature of the industry. Different companies (even different managers within the same company) require different information. The most important issue is whether the

reporting is useful for the planning, controlling, and evaluation purposes.

YOUR TURN

Daryn's Dairy



Assorted Ice Cream Flavors By jeshoots. Pexels CCO

Suppose you have been hired by Daryn's Dairy as a market analyst. Your first assignment is to evaluate the sales of various standard and specialty ice creams within the Midwest region where Daryn's Dairy operates. You also need to determine the best-selling flavors of ice cream in other regions of the United States as well as the selling patterns of the flavors. For example, do some flavors sell better than others at different times of the year, or are some top sellers sold as limited-edition flavors?

Remember that one of the strategic goals of the company is to increase market share, and the first step in meeting this goal is to sell their product in 10 percent more stores within their current market, so your research will help upper-level management carry out the company's goals. Where would you gather the information? What type of information would you need? Where would you find this information? How would the company determine the impact of this type of change on the business? If implemented, what information would you need to assess the success of the plan?

Solution

Answers will vary. Sample answer:

Where would you gather the information? Where would you find this information?

- Current company sales information would be obtained from internal company reports and records that detail the sale of each type of ice cream including volume, cost, price, and profit per flavor.
- Sales of ice cream from other companies may be more difficult to obtain, but the footnotes and supplemental information to the annual reports of those companies being analyzed, as well as industry trade journals, would likely be good sources of information.

What types of information would you need?

- Some of the types of information that would be needed would be the volume of sales of each flavor (number of gallons), how long each flavor has been sold, whether seasonal or limited-edition flavors are produced and sold only once or are on a rotating basis, the size of the market being examined (number of households), whether the other companies sell similar products (organic, all natural, etc.), the median income of consumers or other

information to assess the consumers' willingness to pay for organic products, and so forth.

How would Daryn's Dairy determine the impact of this type of change on the business?

- Management would evaluate the cost to expand into new stores in their current market compared to the potential revenues from selling their products in those stores in order to assess the ability of the potential expansion to generate a profit for the company.

If implemented, what information would Daryn's Dairy need to assess the success of the plan?

- Management would measure the profitability of selling any new products, expanding into new stores in their current market, or both to determine if the implementation of the plan was a success. If the plan is a success and the company is generating profits, the company will continue to figure out ways to improve efficiency and profitability. If the plan is not a success, the company will determine the reasons (cost to produce too high, sales price too high, volume too low, etc.) and make a new plan.

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Ethical Standards

Public Accounting / CPAs and Ethics

Accounting Codes of Ethics

In the United States, accountants can obtain a number of different certifications and can be licensed by each state to practice as a Certified Public Accountant (CPA). Accountants can also belong to professional organizations that have their own codes of conduct. As the online Stanford Encyclopedia of Philosophy explains, "many people engaged in business activity, including accountants and lawyers, are professionals. As such, they are bound by codes of conduct promulgated by professional societies. Many firms also have detailed codes of conduct, developed and enforced by teams of ethics and compliance personnel."[8] CPAs can find a code of ethics in each state of practice and with the AICPA.[9] Certifications such as the CMA, CIA, CFE, CFA, and CFP each have their own codes of ethics.

To facilitate cross-border business activities and accounting, an attempt has been made to set international standards. To this end, accounting standards organizations in more than 100 countries use the International Federation of Accountants' (IFAC website) Code of Ethics for Professional Accountants."[10] When auditing a public company, CPAs may also have to follow a special code of ethics created by the Public Company Accounting Oversight Board (PCAOB), or when performing federal tax work, the US Treasury Department's Circular No. 230 code of ethics. These are just some examples of ethical codes that are covered in more detail

in this course. Each area of accounting work has its own set of ethical rules, but they all require that a professional accountant perform his or her work with integrity.

Ethics & Managerial Accounting



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Unlike the specific rules set forth by GAAP and the SEC that govern financial accounting, managerial accounting does not have specific rules and is considered flexible, as the reporting stays internal and does not need to follow external rules. Managers of a business need detailed information in a timely manner. This means that a managerial accountant needs to understand many detailed aspects of how the company operates in addition to financial accounting methods, because the framework of typical management reports often comes

from the financial statements. However, the reports can be individualized and customized to the information the manager is seeking. Each company has different strategies, timing, and needs for information.

The Institute of Management Accountants (IMA), the professional organization for management accountants, provides research, education, a means of knowledge sharing, and practice development to its members. The IMA also issues the Certified Management Accountant (CMA) certification to those accountants who meet the educational requirements, pass the rigorous two-part exam, and maintain continuing professional education requirements. The CMA exam covers essential managerial accounting topics as well as topics on economics and finance. Many accountants hold both CMA and CPA certifications.

The IMA also develops standards and principles to help management accountants deal with ethical challenges. Trust is an important cornerstone of business interactions, both internal and external. When there is a lack of trust, it changes how decisions are made. Trust develops when there are good ethics: when people know right from wrong. Consider these three questions as put forth by the Institute of Business Ethics: (1) Do I mind others knowing what I have done? (2) Who does my decision affect or hurt? (3) Would my decision be considered fair to those affected? These questions can help evaluate the ethics of a decision.

Ethics is more than simply obeying laws; it involves doing the right thing as well as the legal thing. Many companies have a code of conduct to help guide their employees. For example, **Google** has a code of ethics that they expect all of their employees and board members to follow. Failing to do so can cause termination of employment. The preface of the code includes “Don’t be evil.” They use that to show all employees and other shareholders within Google that they are serious

about ethics—that trust and respect are essential in providing a great service to their customers.

The IMA has its own Statement of Ethical Professional Practice for its members. Managerial accountants should never commit acts that violate the standards of ethics, and they should never ignore such deeds by others within their companies. Many other professional organizations, across many different professions, have codes of ethics. For example, there are codes of ethics for the AICPA, ACFE, Financial Executives International, American Marketing Association, National Society of Professional Engineers, and the American Nurses Association.

Often, when we think of unethical behavior, we imagine large-scale scenarios involving tens of thousands of dollars or more, but ethical issues are more likely faced on a small scale. For example, suppose you work for an organization that makes and sells virtual reality headsets. Because of competition, your company has decreased their forecasted sales for next year by 20 percent over the current year. In a meeting, the CEO expressed concern over the effect of the decreased sales on the bonuses of upper-level executives, since their bonus is tied to meeting income projections. The vice president of marketing suggested in the meeting that if the company simply continued to produce the same number of headsets as they had in the previous year, income levels may still be achieved in order for the bonuses to be awarded. This would involve the company producing excess inventory with hopes of selling them, in order to achieve income levels sufficiently adequate to be able to pay bonuses to executives. While a conflict of interest might not be intuitively obvious, the company (and thus its managerial accountants) has an obligation to many stakeholders such as investors, creditors, employees and the community. The obligation of a corporation to these stakeholders depends somewhat on the stakeholder. For example, the primary obligation to a creditor may be to make

timely payments, the obligation to the community may be to minimize negative environmental impact. Most stakeholders to not have access to internal information or decisions and thus rely on management to be ethical in their decision-making. The company may indeed be able to sell all that it produces, but given the forecasted drop in sales, producing the same number of units as during the current year will likely lead to unsellable inventory, the need to sell the units at a significant discount in order to dispose of them, or both. Following the recommendation to produce more than forecasted sales might hurt the value of the company's stock, which could hurt many categories of stakeholders who depend on the accountants and financial analysts to protect their financial interests.

In addition to managing production and inventory, a budget and the entire budget process have an impact on managerial decision-making. Suppose you are the manager of the research department of a pharmaceutical company. Your budget includes the costs for various types of training for your staff. Because of the amount of time spent in development of a highly promising medication to treat diabetes, your staff has not had time to complete as much training during the current year as you had allowed for in the budget. You are concerned that if you do not use the training money, your training budget will be decreased in the next budget cycle. To prevent this from happening, you arrange for several online training sessions for your staff. These training sessions are on the basics of laboratory safety. All of your staff is very experienced and current on this topic and can likely go straight to the course completion quiz and complete it in a matter of minutes without actually watching any of the ten modules. What would encourage a manager to schedule and spend money on training that is not useful for the employees? While it is expected to stay within the budget, many managers will spend any "excess" amounts remaining in the budget at the

end of the fiscal year. This practice is known as “use it or lose it.” Managers do this to avoid having their budgets cut in the next fiscal year. Stated simply, management spends everything in their budget regardless of the value added or the necessity. This is not ethical behavior and is usually the result of a budgetary process that needs to be modified so that the possibility of being able to pad the budget is removed or at least minimized.

All employees within a company are expected to act ethically within their business actions. This can sometimes be difficult when the company itself almost promotes the idea of unethical actions. For example, **Wells Fargo** started offering incentives to their employees who succeeded in selling to current customers other services and products that the bank had to offer. This incentive created an unethical culture. Employees manufactured fake accounts, credit cards, and other services in order to qualify for the bonuses. In the end, 5,300 employees lost their jobs, and everyone learned a lesson on creating proper incentives. Executives who aspire to run an ethical company can do so, if they change reward systems from “pay for performance” to more holistic values. Examples of proper incentives include attendance rewards, merit rewards, team bonuses, overall profit sharing, and stock options.

Internal Auditors and Their Code of Ethics

Internal auditors are employees of an organization who evaluate internal controls and other operational metrics, and then ethically report their findings to management. An internal auditor may be a Certified Internal Auditor (IIA website), an accreditation granted by the Institute of Internal Auditors (IIA). The IIA defines internal auditing as “an independent, objective assurance and consulting activity designed to add value and improve an organization’s

operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes."[2]

Internal auditors have their own organizational code of ethics. According to the IIA, "the purpose of The Institute's Code of Ethics is to promote an ethical culture in the profession of internal auditing."[3] Company management relies on a disciplined and truthful approach to reporting. The internal auditor is expected to keep confidential any received information, while reporting results in an objective fashion. Management trusts internal auditors to perform their work in a competent manner and with integrity, so that the company can make the best decisions moving forward.

Ethics Legislation

In response to several corporate scandals, the United States Congress passed the Sarbanes-Oxley Act of 2002 (SOX), also known as the "public company accounting reform." It is a federal law (http://www.soxlaw.com/) that was a far-reaching reform of business practices. Its focus is primarily on public accounting firms that act as auditors of publicly traded corporations. The act intended to protect investors by enhancing the accuracy and reliability of corporate financial statements and disclosures. Thousands of corporations now must confirm that their accounting processes comply with SOX. The act itself is fairly detailed, but the most significant issues for compliance are as follows:

- Section 302. The CEO and CFO must review all financial reports and sign the report.
- Section 404. All financial reports must be audited on an annual basis and must be accompanied by an internal

control audit.
- Section 806. Whistleblowers, or those who provide evidence of fraud, are afforded special protections.
- Section 906. The criminal penalties for a fraudulent financial report are increased from pre-SOX. Penalties can be up to $5 million in fines and up to 25 years in prison.

Individuals who work throughout the accounting profession have a significant responsibility to the general public. Financial accountants deliver information about companies that the public uses to make major financial decisions. There must be a level of trust and confidence in the ethical behavior of these accountants. Just like others in the business world, accountants are confronted endlessly with ethical dilemmas. A high standard of ethical behavior is expected of those employed in a profession. While ethical codes are helpful guidelines, the rationale to act ethically must originate from within oneself, from personal morals and values. There are steps that can provide an outline for examining ethical issues:

1. Recognize the ethical issue at hand and those involved (employees, creditors, vendors, and community).
2. Establish the facts of the situation (who, what, where, when, and how).
3. Recognize the competing values related to the issue (confidentiality and conflict of interest).
4. Determine alternative courses of action (do not limit yourself).
5. Evaluate each course of action and how each relates to the values in step 3.
6. Recognize the possible consequences of each course of action and how each affects those involved in step 1.
7. Make a decision, and take a course of action.
8. Evaluate the decision. (Is the issue solved? Did it create other issues?)

One of the issues with ethics is that what one person, community, or even country considers unethical or wrong may not be problematic for another person, community, or country, who see it as a way of doing business. For example, bribery in the world of business happens when an organization or representative of an organization gives money or other financial benefits to another individual, business, or official in order to gain favor or to manipulate a business decision. Bribery in the United States is illegal. However, in Russia or China, a bribe is sometimes one cost of doing business, so it is part of their culture and completely ordinary.

The Foreign Corrupt Practices Act (FCPA) was implemented in 1977 in the aftermath of disclosures of bribery of foreign bureaucrats by more than 400 US corporations. The law is broken down into two parts: the antibribery section and the accounting section. The antibribery section specifically prohibits payments to foreign government officials to aid in attaining or retaining business. This provision applies to all US persons and foreign firms acting within the United States. It also requires corporations that are listed in the United States to converge their accounting records with certain accounting provisions. These include making and keeping records that fairly represent the transactions of the company and maintaining an acceptable system of internal controls. Companies doing business outside the United States are obligated to follow this law and dedicate resources to its compliance.



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The accounting section of the FCPA requires a company to have good internal controls so a slush fund to pay bribes cannot be created and maintained. A *slush fund* is a cash account that is often created for illegal activities or payments that are not typically recorded on the books.

More details on the SOX and the FCPA are covered in such courses as auditing, intermediate accounting, cost accounting, and business law.

YOUR TURN

Logistics Analyst

As a corporate accountant, it is very important to understand both financial and managerial aspects of the company and industry in which you are working. In order to assist management in their roles of planning, controlling, and

evaluating, an accountant needs to be aware not only of GAAP but also of the products or services offered by the company, the processes by which those products or services are produced, and pertinent facts about suppliers, customers, and competitors. Not having this knowledge not only makes it more difficult for the corporate or managerial accountant to perform any assigned duties, but there is also an ethical responsibility to be knowledgeable in order to offer assistance, analysis, or recommendations to management or customers.

Assume you have been hired by **Triumph Motorcycles** as a new logistics analyst. In this position, you will carry out such tasks as obtaining and analyzing information about your company's goods or services; monitoring the production, service, and information processes and flow; and looking for ways to improve efficiency of operations.

How would you go about obtaining the knowledge and understanding you will need to work for this company? How would financial and managerial accounting concepts help you in understanding the company and the industry as a whole?

Solution

Answers will vary. Sample answer:

Ways to learn about the company and industry include the company website, press or news releases, industry trade journals, company internal documents such as procedure manuals and job descriptions, and conversations or interviews with fellow employees at various levels of the organization. The more knowledge you have regarding financial and managerial accounting, the better you can link the operations of the organizations to financial results and the more easily you can ascertain both efficiencies and inefficiencies in the organization.

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CHAPTER 1 - THE ACCOUNTING CYCLE

Financial Accounting- Getting Started

1.1 Defining the Accounting Equation Components

The Basic Accounting Equation

The basic accounting equation represents the idea that a company needs assets to operate, and there are two major sources that contribute to operations: liabilities and equity. The company borrows the funds, creating liabilities, or the company can take the funds provided by the profits generated in the current or past periods, creating retained earnings or some other form of stockholder's equity. The accounting equation can also be thought of from a "sources and claims" perspective; that is, the assets (items owned by the organization) were obtained by incurring liabilities or were provided by owners. Stated differently, everything a company owns must equal everything the company owes to creditors (lenders) and owners (individuals for sole proprietors or stockholders for companies or corporations).

Assume a family purchases a home valued at $200,000. They make a down payment of $25,000 while financing the remaining balance with a $175,000 bank loan. This example demonstrates one of the most important concepts in the study of accounting: the accounting equation, which is:

$$Assets = Liabilities + Owner's\ Equity$$

In our example, the accounting equation would look like this:

$$\$200,000 = \$175,000 + \$25,000$$

As you continue your accounting studies and you consider the different major types of business entities available (sole proprietorships, partnerships, and corporations), there is another important concept for you to remember. This concept is that no matter which of the entity options that you choose, the accounting process for all of them will be predicated on the accounting equation.

YOUR TURN

The Accounting Equation

On a sheet of paper, use three columns to create your own accounting equation. In the first column, list all of the things you own (assets). In the second column, list any amounts owed (liabilities). In the third column, using the accounting equation, calculate, you guessed it, the net amount of the asset (equity). When finished, total the columns to determine your net worth.

Hint: do not forget to subtract the liability from the value of the asset.

Here is something else to consider: is it possible to have negative equity? It sure is . . . ask any college student who has taken out loans. At first glance there is no asset directly associated with the amount of the loan. But is that, in fact, the case? You might ask yourself why make an investment in a college education—what is the benefit (asset) to going to college? The answer lies in the difference in lifetime earnings with a college degree versus without a college degree. This is influenced by many things, including the supply and demand of jobs and employees. It is also influenced by the earnings for the type of college degree pursued. (Where do you think accounting ranks?)

Solution

Answers will vary but may include vehicles, clothing, electronics (include cell phones and computer/gaming systems, and sports equipment). They may also include money owed on these assets, most likely vehicles and perhaps cell phones. In the case of a student loan, there may be a liability with no corresponding asset (yet). Responses should be able to evaluate the benefit of investing in college is the wage differential between earnings with and without a college degree.

Expanding the Accounting Equation

Let's continue our exploration of the accounting equation, focusing on the equity component, in particular. Recall that we defined equity as the net worth of an organization. It is helpful to also think of net worth as the *value* of the organization. Recall, too, that revenues (inflows as a result of providing goods and services) *increase* the value of the organization. So, every

dollar of revenue an organization generates increases the overall value of the organization.

Likewise, expenses (outflows as a result of generating revenue) *decrease* the value of the organization. So, each dollar of expenses an organization incurs decreases the overall value of the organization. The same approach can be taken with the other elements of the financial statements:

- Gains *increase* the value (equity) of the organization.
- Losses *decrease* the value (equity) of the organization.
- Investments by owners *increase* the value (equity) of the organization.
- Distributions to owners *decrease* the value (equity) of the organization.
- Changes in assets and liabilities can *either* increase or decrease the value (equity) of the organization depending on the net result of the transaction.

A graphical representation of this concept is shown in Figure 2.1.

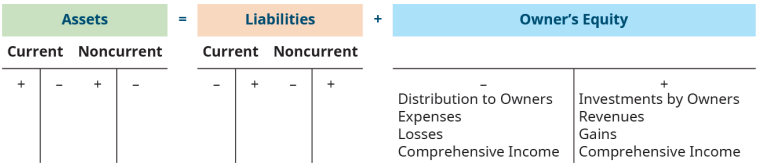


Figure 1.1 Graphical Representation of the Accounting Equation. *Both assets and liabilities are categorized as current and noncurrent. Also highlighted are the various activities that affect the equity (or net worth) of the business. Graphical Representation of the Accounting Equation © Rice University is licensed under a CC BY-NC-SA (Attribution NonCommercial ShareAlike) license.*
Long Description

The expanded accounting equation breaks down Equity into four categories: common stock, dividends, revenues, and expenses. This considers each element of contributed capital

and retained earnings individually to better illustrate each one's impact on changes in equity.

This expansion of the equity section allows a company to see the impact to equity from changes to revenues and expenses, and to owner investments and payouts. It is important to have more detail in this equity category to understand the effect on financial statements from period to period. For example, an increase to revenue can increase net income on the income statement, increase retained earnings on the statement of retained earnings, and change the distribution of stockholder's equity on the balance sheet. This may be difficult to understand where these changes have occurred without revenue recognized individually in this expanded equation.

A business can now use this equation to analyze transactions in more detail. But first, it may help to examine the many accounts that can fall under each of the main categories of Assets, Liabilities, and Equity, in terms of their relationship to the expanded accounting equation. We begin with the left side of the equation, the assets, and work toward the right side of the equation to liabilities and equity.

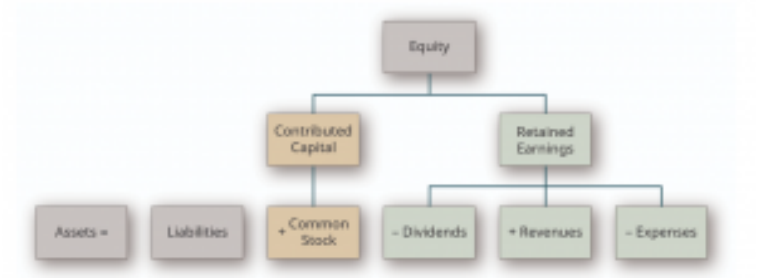


Figure 1.2 Expanded Accounting Equation *© Rice University is licensed under a CC BY-NC-SA (Attribution NonCommercial ShareAlike) license*
Long Description

Assets

On the left side of the equation are assets. Assets are resources a company owns that have an economic value. Assets are represented on the balance sheet financial statement. Some common examples of assets are cash, accounts receivable, inventory, supplies, prepaid expenses, notes receivable, equipment, buildings, machinery, and land.

Cash includes paper currency as well as coins, checks, bank accounts, and money orders. Anything that can be quickly liquidated into cash is considered cash. Cash activities are a large part of any business, and the flow of cash in and out of the company is reported on the statement of cash flows.

Accounts receivable is money that is owed to the company, usually from a customer. The customer has not yet paid with cash for the provided good or service but will do so in the future. Common phrasing to describe this situation is that a customer purchased something "on account," meaning that the customer has asked to be billed and will pay at a later date: "Account" because a customer has not paid us yet but instead has asked to be billed; "Receivable" because we will receive the money in the future.

Inventory refers to the goods available for sale. Service companies do not have goods for sale and would thus not have inventory. Merchandising and manufacturing businesses do have inventory. Examples of supplies (office supplies) include pens, paper, and pencils. Supplies are considered assets until an employee uses them. At the point they are used, they no longer have an economic value to the organization, and their cost is now an expense to the business.

Prepaid expenses are items paid for in advance of their use. They are considered assets until used. Some examples can include insurance and rent. Insurance, for example, is usually purchased for more than one month at a time (six months typically). The company does not use all six months of the

insurance at once, it uses it one month at a time. However, the company prepays for all of it up front. As each month passes, the company will adjust its records to reflect the cost of one month of insurance usage.

Notes receivable is similar to accounts receivable in that it is money owed to the company by a customer or other entity. The difference here is that a note typically includes interest and specific contract terms, and the amount may be due in more than one accounting period.

Equipment examples include desks, chairs, and computers; anything that has a long-term value to the company that is used in the office. Equipment is considered a long-term asset, meaning you can use it for more than one accounting period (a year for example). Buildings, machinery, and land are all considered long-term assets. Machinery is usually specific to a manufacturing company that has a factory producing goods. Machinery and buildings also depreciate. Unlike other long-term assets such as machinery, buildings, and equipment, land is not depreciated. The process to calculate the loss on land value could be very cumbersome, speculative, and unreliable; therefore, the treatment in accounting is for land to *not* be depreciated over time.

Liabilities

The accounting equation emphasizes a basic idea in business; that is, businesses need assets in order to operate. There are two ways a business can finance the purchase of assets. First, it can sell shares of its stock to the public to raise money to purchase the assets, or it can use profits earned by the business to finance its activities. Second, it can borrow the money from a lender such as a financial institution. You will learn about other assets as you progress through the book. Let's now take a look at the right side of the accounting equation.

Liabilities are obligations to pay an amount owed to a lender (creditor) based on a past transaction. Liabilities are reported on the balance sheet. It is important to understand that when we talk about liabilities, we are not just talking about loans. Money collected for gift cards, subscriptions, or as advance deposits from customers could also be liabilities. Essentially, anything a company owes and has yet to pay within a period is considered a liability, such as salaries, utilities, and taxes.

For example, a company uses $400 worth of utilities in May but is not billed for the usage, or asked to pay for the usage, until June. Even though the company does not have to pay the bill until June, the company owed money for the usage that occurred in May. Therefore, the company must record the usage of electricity, as well as the liability to pay the utility bill, in May.

Eventually that debt must be repaid by performing the service, fulfilling the subscription, or providing an asset such as merchandise or cash. Some common examples of liabilities include accounts payable, notes payable, and unearned revenue.

Accounts payable recognizes that the company owes money and has not paid. Remember, when a customer purchases something "on account" it means the customer has asked to be billed and will pay at a later date. In this case the purchasing company is the "customer." The company will have to pay the money due in the future, so we use the word "payable." The debt owed is usually paid off in less than one accounting period (less than a year typically) if it is classified as an account payable.

A notes payable is similar to accounts payable in that the company owes money and has not yet paid. Some key differences are that the contract terms are usually longer than one accounting period, interest is included, and there is typically a more formalized contract that dictates the terms of the transaction.

Unearned revenue represents a customer's advanced payment for a product or service that has yet to be provided by the company. Since the company has not yet provided the product or service, it cannot recognize the customer's payment as revenue, according to the revenue recognition principle. Thus, the account is called unearned revenue. The company owing the product or service creates the liability to the customer.

Equity

Stockholder's equity refers to the owner's (stockholders') investments in the business and earnings. These two components are contributed capital and retained earnings.

The owner's investments in the business typically come in the form of common stock and are called contributed capital. There is a hybrid owner's investment labeled as preferred stock that is a combination of debt and equity (a concept covered in more advanced accounting courses). The company will issue shares of common stock to represent stockholder ownership.

Another component of stockholder's equity is company earnings. These retained earnings are what the company holds onto at the end of a period to reinvest in the business, after any distributions to ownership occur. Stated more technically, retained earnings are a company's cumulative earnings since the creation of the company minus any dividends that it has declared or paid since its creation. One tricky point to remember is that retained earnings are not classified as assets. Instead, they are a component of the stockholder's equity account, placing it on the right side of the accounting equation.

Distribution of earnings to ownership is called a dividend. The dividend could be paid with cash or be a distribution of more

company stock to current shareholders. Either way, dividends will decrease retained earnings.

Also affecting retained earnings are revenues and expenses, by way of net income or net loss. Revenues are earnings from the sale of goods and services. An increase in revenues will also contribute toward an increase in retained earnings. Expenses are the cost of resources associated with earning revenues. An increase to expenses will contribute toward a decrease in retained earnings. Recall that this concept of recognizing expenses associated with revenues is the expense recognition principle. Some examples of expenses include bill payments for utilities, employee salaries, and loan interest expense. A business does not have an expense until it is "incurred." Incurred means the resource is used or consumed. For example, you will not recognize utilities as an expense until you have used the utilities. The difference between revenues earned and expenses incurred is called net income (loss) and can be found on the income statement.

Net income reported on the income statement flows into the statement of retained earnings. If a business has net income (earnings) for the period, then this will increase its retained earnings for the period. This means that revenues exceeded expenses for the period, thus increasing retained earnings. If a business has net loss for the period, this decreases retained earnings for the period. This means that the expenses exceeded the revenues for the period, thus decreasing retained earnings.

You will notice that stockholder's equity increases with common stock issuance and revenues, and decreases from dividend payouts and expenses. Stockholder's equity is reported on the balance sheet in the form of contributed capital (common stock) and retained earnings. The statement of retained earnings computes the retained earnings balance at the beginning of the period, adds net income or subtracts net loss from the income statement, and subtracts dividends

declared, to result in an ending retained earnings balance reported on the balance sheet.

Not All Transactions Affect Equity

As you continue to develop your understanding of accounting, you will encounter many types of transactions involving different elements of the financial statements. The previous examples highlighted elements that change the equity of an organization. Not all transactions, however, ultimately impact equity. For example, the following do not impact the equity or net worth of the organization:

- Exchanges of assets for assets
- Exchanges of liabilities for liabilities
- Acquisitions of assets by incurring liabilities
- Settlements of liabilities by transferring assets



An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://psu.pb.unizin.org/acctg211/?p=57#h5p-2

Equity and Legal Structure

Recall that equity can also be referred to as net worth—the value of the organization. The concept of equity does not change depending on the legal structure of the business (sole proprietorship, partnership, and corporation). The terminology

does, however, change slightly based on the type of entity. For example, investments by owners are considered "capital" transactions for sole proprietorships and partnerships but are considered "common stock" transactions for corporations. Likewise, distributions to owners are considered "drawing" transactions for sole proprietorships and partnerships but are considered "dividend" transactions for corporations.

As another example, in sole proprietorships and partnerships, the final amount of net income or net loss for the business becomes "Owner(s), Capital." In a corporation, net income or net loss for the business becomes retained earnings, which is the cumulative, undistributed net income or net loss, less dividends paid for the business since its inception.

The essence of these transactions remains the same: organizations become *more* valuable when owners make investments in the business and the businesses earn a profit (net income), and organizations become *less* valuable when owners receive distributions (dividends) from the organization and the businesses incur a loss (net loss). Because accountants are providing information to stakeholders, it is important for accountants to fully understand the specific terminology associated with the various legal structures of organizations.

The following screencast provides an overview of the expanded accounting equation in a slightly rearranged format:



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=57#oembed-1

Now that you have a basic understanding of the accounting

equation, and examples of assets, liabilities, and stockholder's equity, you will be able to analyze the many transactions a business may encounter and determine how each transaction affects the accounting equation and corresponding financial statements.

Long Descriptions

Figure 2.1 Long Description: Assets (both current and noncurrent) equal Liabilities (both current and noncurrent) plus Owner's Equity. Each of these has a big "T" below it. The current and non current assets each have the big "T" with a plus sign on the left side under the top line and a minus sign on the right side under the top line. The current and noncurrent liabilities each have a big "T" with a minus sign on the left side under the top line and a plus sign on the right side under the top line. The Owner's Equity has a large "T" with a minus sign on the left side with Distribution to Owners, Expenses, Losses, and Comprehensive Income showing as the reasons. There is a plus sign on the right side with Investments by Owners, Revenues, Gains, and Comprehensive Income as the reasons. Return

Figure 2.2 Long Description: Hierarchical group of boxes representing the organizations that create generally accepted accounting principles (GAAP) and the principles, conventions, assumptions, and concepts that support GAAP. The top box is labeled SEC (enforces GAAP). The box below that is labeled FASB (sets GAAP). The box below that is labeled GAAP Accounting Standards. Below that are four boxes labeled left to right: Expense Recognition Principle; Full Disclosure Principle; Conservatism Convention; Going Concern Assumption. Below that are five boxes labeled left to right: Revenue Recognition Principle; Cost Principle; Separate Entity Concept; Monetary Measurement Concept; Time Period Assumption. Return

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1.2 Transaction Analysis- accounting equation format

Now that you've gained a basic understanding of both the basic and expanded accounting equations, let's consider some of the transactions a business may encounter. We'll review how each transaction affects the basic accounting equation.

Reviewing and Analyzing Transactions

Let us assume our business is a service-based company. We use Lynn Sanders' small printing company, Printing Plus, as our example. Please notice that since Printing Plus is a corporation, we are using the Common Stock account, instead of Owner's Equity. The following are several transactions from this business's current month:

1. Issues $20,000 shares of common stock for cash.
2. Purchases equipment on account for $3,500, payment due within the month.
3. Receives $4,000 cash in advance from a customer for services not yet rendered.
4. Provides $5,500 in services to a customer who asks to be billed for the services.
5. Pays a $300 utility bill with cash.
6. Distributed $100 cash in dividends to stockholders.

We now analyze each of these transactions, paying attention to how they impact the accounting equation and corresponding financial statements.

Transaction 1: Issues $20,000 shares of common stock for cash.

Assets	=	Liabilities	+	Equity
Cash +$20,000				Common Stock +$20,000

Analysis: Looking at the accounting equation, we know cash is an asset and common stock is stockholder's equity. When a company collects cash, this will increase assets because cash is coming into the business. When a company issues common stock, this will increase a stockholder's equity because he or she is receiving investments from owners.

Remember that the accounting equation must remain balanced, and assets need to equal liabilities plus equity. On the asset side of the equation, we show an increase of $20,000. On the liabilities and equity side of the equation, there is also an increase of $20,000, keeping the equation balanced. Changes to assets, specifically cash, will increase assets on the balance sheet and increase cash on the statement of cash flows. Changes to stockholder's equity, specifically common stock, will increase stockholder's equity on the balance sheet.

Transaction 2: Purchases equipment on account for $3,500, payment due within the month.

Assets	=	Liabilities	+	Equity
Equipment +$3,500		Accounts Payable +$3,500		

Analysis: We know that the company purchased equipment, which is an asset. We also know that the company purchased the equipment on account, meaning it did not pay for the equipment immediately and asked for payment to be billed instead and paid later. Since the company owes money and has not yet paid, this is a liability, specifically labeled as *accounts*

payable. There is an increase to assets because the company has equipment it did not have before. There is also an increase to liabilities because the company now owes money. The more money the company owes, the more that liability will increase.

The accounting equation remains balanced because there is a $3,500 increase on the asset side, and a $3,500 increase on the liability and equity side. This change to assets will increase assets on the balance sheet. The change to liabilities will increase liabilities on the balance sheet.

Transaction 3: Receives $4,000 cash in advance from a customer for services not yet rendered.

Assets	=	Liabilities	+	Equity
Cash +$4,000		Unearned Revenue +$4,000		

Analysis: We know that the company collected cash, which is an asset. This collection of $4,000 increases assets because money is coming into the business.

The company has yet to provide the service. According to the revenue recognition principle, the company cannot recognize that revenue until it provides the service. Therefore, the company has a liability to the customer to provide the service and must record the liability as unearned revenue. The liability of $4,000 worth of services increases because the company has more unearned revenue than previously.

The equation remains balanced, as assets and liabilities increase. The balance sheet would experience an increase in assets and an increase in liabilities.

Transaction 4: Provides $5,500 in services to a customer who asks to be billed for the services.

Assets	=	Liabilities	+	Equity
Accounts Receivable +$5,500				Revenue +$5,500

Analysis: The customer asked to be billed for the service, meaning the customer did not pay with cash immediately.

The customer owes money and has not yet paid, signaling an accounts receivable. Accounts receivable is an asset that is increasing in this case. This customer obligation of $5,500 adds to the balance in accounts receivable.

The company did provide the services. As a result, the revenue recognition principle requires recognition as revenue, which increases equity for $5,500. The increase to assets would be reflected on the balance sheet. The increase to equity would affect three statements. The income statement would see an increase to revenues, changing net income (loss). Net income (loss) is computed into retained earnings on the statement of retained earnings. This change to retained earnings is shown on the balance sheet under stockholder's equity.

Transaction 5: Pays a $300 utility bill with cash.

Assets	=	Liabilities	+	Equity
Cash –$300				Expense –$300

Analysis: The company paid with cash, an asset. Assets are decreasing by $300 since cash was used to pay for this utility bill. The company no longer has that money.

Utility payments are generated from bills for services that were used and paid for within the accounting period, thus recognized as an expense. The expense decreases equity by $300. The decrease to assets, specifically cash, affects the balance sheet and statement of cash flows. The decrease to equity as a result of the expense affects three statements. The income statement would see a change to expenses, changing net income (loss). Net income (loss) is computed into retained earnings on the statement of retained earnings. This change to retained earnings is shown on the balance sheet under stockholder's equity.

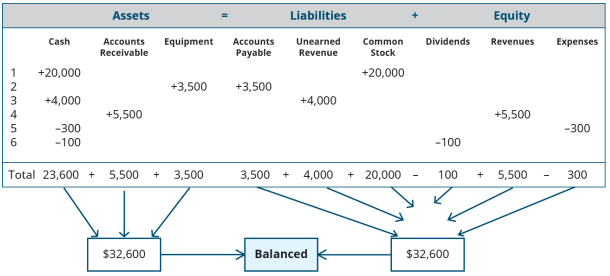


Figure 1.3 *Diagram of a table that summarizes all 6 transactions. Rice University. Source: Openstax CC BY NC-SA Long Description*

As you can see, assets total $32,600, while liabilities added to equity also equal $32,600. Our accounting equation remains balanced.

The following screencast walks you through the following similar examples:

1. Owner invests $50,000 cash, receiving common stock in exchange for the investment.
2. Owner invests $10,000 equipment, receiving common stock in exchange for the investment.
3. Purchase equipment on account, $12,000.
4. Paid $1,600 for monthly rent.
5. Performed services for cash, $2000.
6. Performed services on account, $7,000.
7. Paid $8,000 to purchase equipment.
8. Paid $2,400 salary to staff assistant.
9. Collected $5,000 on account.
10. Paid $12,000 on account.
11. Paid $500 dividends.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=73#oembed-1

YOUR TURN! For each scenario, click on the appropriate account category and its related effect (+ or -).

An interactive H5P element has been excluded from this version of the text. You can view it online here: https://psu.pb.unizin.org/acctg211/?p=73#h5p-4

Long Description

Assets equal Liabilities plus Equity in a gray highlighted heading. Below the heading are nine columns, labeled left to right: Cash, Accounts Receivable, Equipment, Accounts Payable, Unearned Revenue, Common Stock, Dividends, Revenues, Expenses. Below the column headings are six lines. Line 1, plus 20,000 under Cash and plus 20,000 under Common Stock. Line 2, plus 3,500 under Equipment and plus 3,500 under Accounts Payable. Line 3, plus 4,000 under Cash and plus 4,000 under Unearned Revenue. Line 4, plus 5,500 under Accounts Receivable and plus 5,500 under Revenues. Line 5, minus 300 under Cash and minus 300 under Expenses. Line 6, minus 100 under Cash and minus 100 under Dividends. There is a Total

line showing, for the first three columns: 23,600 plus 5,500 plus 3,500; below which are three arrows pointing to a box on the left containing $32,600. The Total line shows, for the remaining six columns: 3,500 plus 4,000 plus 20,000 minus 100 plus 5,500 minus 300; below which are six arrows pointing to a box on the right containing $32,600. The left and right boxes have arrows pointing to a middle box stating Balanced. Return



An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://psu.pb.unizin.org/acctg211/?p=73#h5p-1

1.3 Current & Noncurrent Assets & Liabilities

In accounting, we classify assets based on whether or not the asset will be used or consumed within a certain period of time, generally one year. If the asset will be used or consumed in one year or less, we classify the asset as a current asset. If the asset will be used or consumed over more than one year, we classify the asset as a noncurrent asset.

Another thing you might have recognized when reviewing assets is that not all of the items were something you could touch or move. Those you can touch are known as tangible assets. Not all assets are tangible. An asset could be an intangible asset, meaning the item lacks physical substance—it cannot be touched or moved. Take a moment to think about your favorite type of shoe or a popular type of farm tractor. Would you be able to recognize the maker of that shoe or the tractor by simply seeing the logo? Chances are you would. These are examples of intangible assets, trademarks to be precise. A trademark has value to the organization that created (or purchased) the trademark, and the trademark is something the organization controls—others cannot use the trademark without permission.

Similar to the accounting for assets, liabilities are classified based on the time frame in which the liabilities are expected to be settled. A liability that will be settled in one year or less (generally) is classified as a current liability, while a liability that is expected to be settled in more than one year is classified as a noncurrent liability.

Examples of current assets include accounts receivable,

which is the outstanding customer debt on a credit sale; inventory, which is the value of products to be sold or items to be converted into sellable products; and sometimes a notes receivable, which is the value of amounts loaned that will be received in the future with interest, assuming that it will be paid within a year.

Examples of current liabilities include accounts payable, which is the value of goods or services purchased that will be paid for at a later date, and notes payable, which is the value of amounts borrowed (usually not inventory purchases) that will be paid in the future with interest.

Examples of noncurrent assets include notes receivable (notice notes receivable can be either current or noncurrent), land, buildings, equipment, and vehicles. An example of a noncurrent liability is notes payable (notice notes payable can be either current or noncurrent).

Why Does Current versus Noncurrent Matter?

At this point, let's take a break and explore why the distinction between current and noncurrent assets and liabilities matters. It is a good question because, on the surface, it does not seem to be important to make such a distinction. After all, assets are things owned or controlled by the organization, and liabilities are amounts owed by the organization; listing those amounts in the financial statements provides valuable information to stakeholders. But we have to dig a little deeper and remind ourselves that stakeholders are using this information to make decisions. Providing the amounts of the assets and liabilities answers the "what" question for stakeholders (that is, it tells stakeholders the value of assets), but it does not answer the "when" question for stakeholders. For example, knowing that

an organization has $1,000,000 worth of assets is valuable information, but knowing that $250,000 of those assets are current and will be used or consumed within one year is more valuable to stakeholders. Likewise, it is helpful to know the company owes $750,000 worth of liabilities, but knowing that $125,000 of those liabilities will be paid within one year is even more valuable. In short, the *timing* of events is of particular interest to stakeholders.

1.4 Rules of Debit (DR) and Credit (CR)

Each account can be represented visually by splitting the account into left and right sides as shown. This graphic representation of a general ledger account is known as a T-account. A T-account is called a "T-account" because it looks like a "T," as you can see with the T-account shown here.

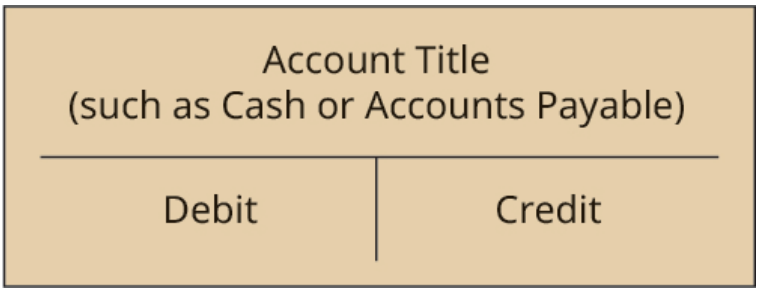
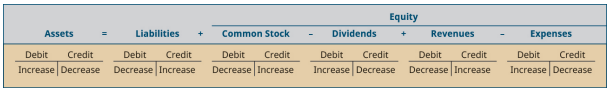


Figure 1.4 *A representation of a T-account. Rice University. Source: Openstax CC BY NC-SA Long Description*

A debit records financial information on the left side of each account. A credit records financial information on the right side of an account. One side of each account will increase and the other side will decrease. The ending account balance is found by calculating the difference between debits and credits for each account. You will often see the terms *debit* and *credit* represented in shorthand, written as *DR* or *dr* and *CR* or *cr*, respectively. Depending on the account type, the sides that increase and decrease may vary.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=79#oembed-1

We can illustrate each account type and its corresponding debit and credit effects in the form of an *expanded accounting equation*.



Assets		=	Liabilities		+	Equity											
						Common Stock		–	Dividends		+	Revenues		–	Expenses		
Debit	Credit		Debit	Credit		Debit	Credit		Debit	Credit		Debit	Credit		Debit	Credit	
Increase	Decrease		Decrease	Increase		Decrease	Increase		Increase	Decrease		Decrease	Increase		Increase	Decrease	

Figure 1.5 *A representation of the expanded accounting equation. Rice University. Source: Openstax CC BY NC-SA Long Description*

As we can see from this expanded accounting equation, Assets accounts increase on the debit side and decrease on the credit side. This is also true of Dividends and Expenses accounts. Liabilities increase on the credit side and decrease on the debit side. This is also true of Common Stock and Revenues accounts. This becomes easier to understand as you become familiar with the *normal balance* of an account.

Normal Balance of an Account

The normal balance is the expected balance each account type maintains, which is the side that increases. As assets and expenses increase on the debit side, their normal balance is a debit. Dividends paid to shareholders also have a normal balance that is a debit entry. Since liabilities, equity (such as common stock), and revenues increase with a credit, their "normal" balance is a credit. Table 1.1 shows the normal balances and increases for each account type.

Table 1.1 Account Normal Balances and Increases
By: Rice University OpenStax CC BY-NC-SA 4.0

Type of account	Increases with	Normal balance
Asset	Debit	Debit
Liability	Credit	Credit
Common Stock	Credit	Credit
Dividends	Debit	Debit
Revenue	Credit	Credit
Expense	Debit	Debit

When an account produces a balance that is contrary to what the expected normal balance of that account is, this account has an abnormal balance. Let's consider the following example to better understand abnormal balances.

Let's say there were a credit of $4,000 and a debit of $6,000 in the Accounts Payable account. Since Accounts Payable increases on the credit side, one would expect a normal balance on the credit side. However, the difference between the two figures in this case would be a debit balance of $2,000, which is an abnormal balance. This situation could possibly occur with an overpayment to a supplier or an error in recording.



An interactive H5P element has been excluded from this version of the text. You can view it online here: https://psu.pb.unizin.org/acctg211/?p=79#h5p-5

Long Descriptions

A representation of a T-account. There is a horizontal line across the center, above which is the label Account Title (such as Cash or Accounts Payable). There is a short vertical line extending below the center of the horizontal line. The space to the left of the vertical line is labeled Debit. The space to the right of the vertical line is labeled Credit. Return

A representation of the expanded accounting equation divided into an upper and lower section. The upper section reads, from left to right, Assets equal Liabilities plus Equity. Equity is above a long horizontal line below which is labeled, from left to right, Common Stock minus Dividends plus Revenues minus Expenses. The lower section contains six T-accounts that are arranged under the labels in the upper section. The top of each T-account is labeled Debit on the left side and Credit on the right side. The T-account below Assets is labeled Increase on the left and Decrease on the right. The T-account below Liabilities is labeled Decrease on the left and Increase on the right. The T-account below Common Stock is labeled Decrease on the left and Increase on the right. The T-account below Dividends is labeled Increase on the left and Decrease on the right. The T-account below Revenues is labeled Decrease on the left and Increase on the right. The T-account below Expenses is labeled Increase on the left and Decrease on the right. Return

1.5 Transaction Analysis- from accounting equation to journal entries

Analyzing and recording transactions represent the first steps in one continuous process known as the accounting cycle. The accounting cycle is a step-by-step process to record business activities and events to keep financial records up to date. The process occurs over one accounting period and will begin the cycle again in the following period. A period is one operating cycle of a business, which could be a month, quarter, or year. Review the accounting cycle in Figure 2.4.

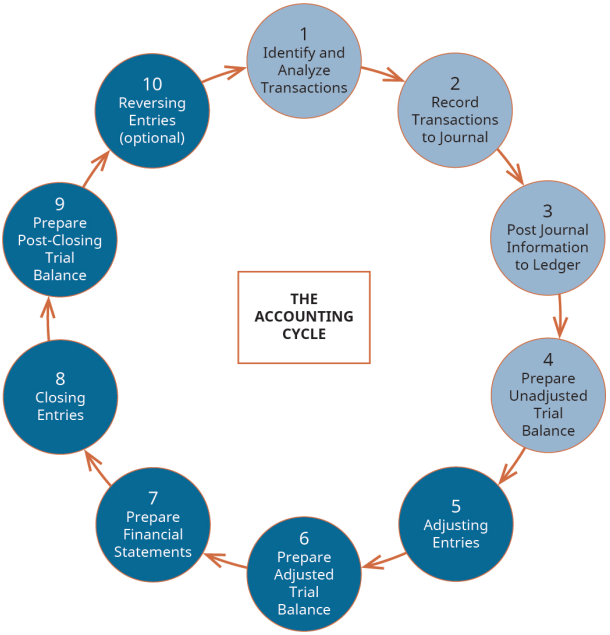


Figure 1.6 The Accounting Cycle. *Rice University. Source: Openstax CC BY NC-SA Long Description*

As you can see, the cycle begins with identifying and analyzing transactions. The entire cycle is meant to keep financial data organized and easily accessible to both internal and external users of information.

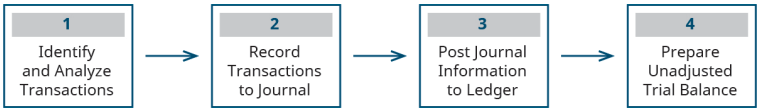


Figure 1.7 The first four steps in the accounting cycle. *Rice University. Source: Openstax CC BY NC-SA*

These first four steps set the foundation for the recording process.

Step 1. Identifying and analyzing transactions is the first step in the process. This takes information from original sources or activities and translates that information into usable financial data. An original source is a traceable record of information that contributes to the creation of a business transaction. For example, a sales invoice is considered an original source. Activities would include paying an employee, selling products, providing a service, collecting cash, borrowing money, and issuing stock to company owners. Once the original source has been identified, the company will analyze the information to see how it influences financial records.

Let's say that Mark Summers of Supreme Cleaners provides cleaning services to a customer. He generates an invoice for $200, the amount the customer owes, so he can be paid for the service. This sales receipt contains information such as how much the customer owes, payment terms, and dates. This sales receipt is an original source containing financial information that creates a business transaction for the company.

Double-Entry Bookkeeping

The basic components of even the simplest accounting system are *accounts* and a *general ledger*. An account is a record showing increases and decreases to assets, liabilities, and equity—the basic components found in the accounting equation. Each of these categories, in turn, includes many individual accounts, all of which a company maintains in its general ledger. A general ledger is a comprehensive listing of all of a company's accounts with their individual balances.

Accounting is based on what we call a double-entry accounting system, which requires the following:

- Each time we record a transaction, we must record a change in at least two different accounts. Having two or more accounts change will allow us to keep the accounting equation in balance.
- Not only will at least two accounts change, but there must also be at least one debit and one credit side impacted.
- The sum of the debits must equal the sum of the credits for each transaction.

Journals

Accountants use special forms called *journals* to keep track of their business transactions. A journal is the first place information is entered into the accounting system. A journal is often referred to as the book of original entry because it is the place the information originally enters into the system. A journal keeps a historical account of all recordable transactions with which the company has engaged. In other words, a journal is similar to a diary for a business. When you enter information into a journal, we say you are journalizing the entry.

Journaling the entry is the second step in the accounting cycle. Here is a picture of a journal.

JOURNAL			
Date	**Account**	**Debit**	**Credit**

You can see that a journal has columns labeled debit and credit. The debit is on the left side, and the credit is on the right. Let's look at how we use a journal.

When filling in a journal, there are some rules you need to follow to improve journal entry organization.

Formatting When Recording Journal Entries

- Include a date of when the transaction occurred.
- The debit account title(s) always come first and on the left.
- The credit account title(s) always come after all debit titles are entered, and on the right.
- The titles of the credit accounts will be indented below the debit accounts.
- You will have at least one debit (possibly more).
- You will always have at least one credit (possibly more).
- The dollar value of the debits must equal the dollar value of the credits or else the equation will go out of balance.
- You will write a short description after each journal entry.
- Skip a space after the description before starting the next journal entry.

An example journal entry format is as follows. It is not taken from previous examples but is intended to stand alone.

JOURNAL			
Date	**Description**	**Debit**	**Credit**
Apr. 1, 2018	Cash	5,000	
	Common Stock		5,000
	Received cash in exchange for common stock		

Note that this example has only one debit account and one credit account, which is considered a simple entry. A compound entry is when there is more than one account listed under the debit and/or credit column of a journal entry (as seen in the following).

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 1, 2018	Cash Supplies Common Stock *Received cash and supplies in exchange for common stock*	3,000 2,000	 5,000

Notice that for this entry, the rules for recording journal entries have been followed. There is a date of April 1, 2018, the debit account titles are listed first with Cash and Supplies, the credit account title of Common Stock is indented after the debit account titles, there are at least one debit and one credit, the debit amounts equal the credit amount, and there is a short description of the transaction.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=77#oembed-1

Let's revisit the prior series of transactions commonly recorded by businesses:

1. Owner invests $50,000 cash, receiving common stock in exchange for the investment.
2. Owner invests $10,000 equipment, receiving common stock in exchange for the investment.
3. Purchase equipment on account, $12,000.
4. Paid $1,600 for monthly rent.

5. Performed services for cash, $2000.
6. Performed services on account, $7,000.
7. Paid $8,000 to purchase equipment.
8. Paid $2,400 salary to staff assistant.
9. Collected $5,000 on account.
10. Paid $12,000 on account.
11. Paid $500 dividends.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=77#oembed-2

Long Description

A large circle labeled, in the center, The Accounting Cycle. The large circle consists of 10 smaller circles with arrows pointing from one smaller circle to the next one. The smaller circles are labeled, in clockwise order: 1 Identify and Analyze Transactions; 2 Record Transactions to Journal; 3 Post Journal Information to Ledger; 4 Prepare Unadjusted Trial Balance; 5 Adjusting Entries; 6 Prepare Adjusted Trial Balance; 7 Prepare Financial Statements; 8 Closing Entries; 9 Prepare Post-Closing Trial Balance; 10 Reversing Entries (optional). Return

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1.6 Unadjusted Trial Balance

Once all the monthly transactions have been analyzed, journalized, and posted on a continuous day-to-day basis over the accounting period (a month in our example), we are ready to start working on preparing a trial balance (unadjusted). Preparing an unadjusted trial balance is the fourth step in the accounting cycle. A trial balance is a list of all accounts in the general ledger that have nonzero balances. A trial balance is an important step in the accounting process, because it helps identify any computational errors throughout the first three steps in the cycle.

When constructing a trial balance, we must consider a few formatting rules, akin to those requirements for financial statements:

- The header must contain the name of the company, the label of a Trial Balance (Unadjusted), and the date.
- Accounts are listed in the accounting equation order with assets listed first followed by liabilities and finally equity.
- Amounts at the top of each debit and credit column should have a dollar sign.
- When amounts are added, the final figure in each column should be underscored.
- The totals at the end of the trial balance need to have dollar signs and be double-underscored.

Transferring information from T-accounts to the trial balance requires consideration of the final balance in each account. If the final balance in the ledger account (T-account) is a debit balance, you will record the total in the left column of the trial

balance. If the final balance in the ledger account (T-account) is a credit balance, you will record the total in the right column.

Once all ledger accounts and their balances are recorded, the debit and credit columns on the trial balance are totaled to see if the figures in each column match each other. The final total in the debit column must be the same dollar amount that is determined in the final credit column. For example, if you determine that the final debit balance is $24,000 then the final credit balance in the trial balance must also be $24,000. If the two balances are not equal, there is a mistake in at least one of the columns.

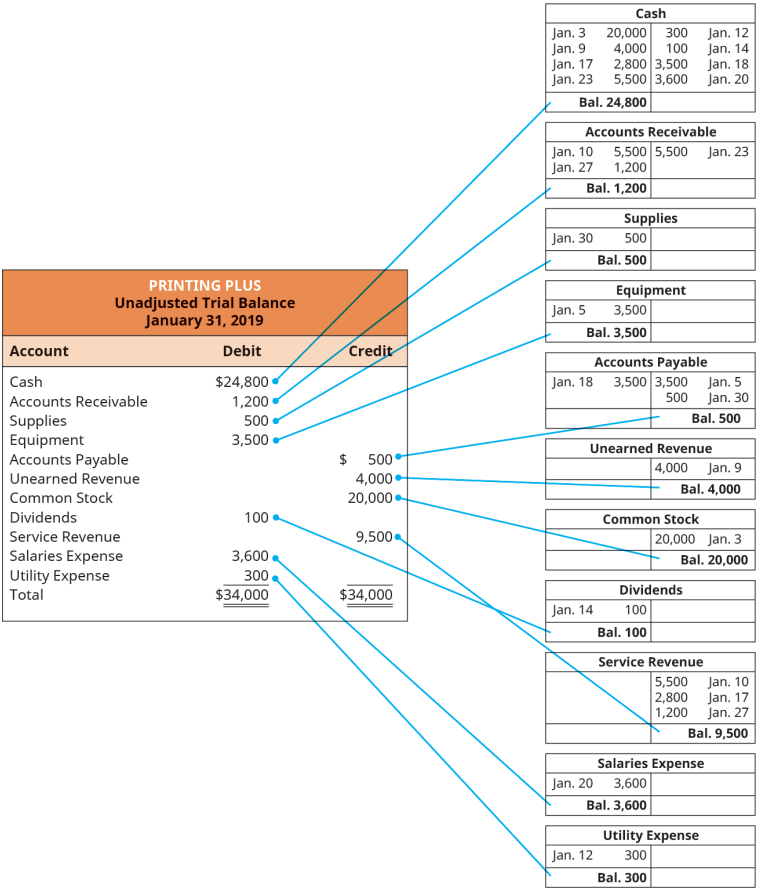


Figure 1.8 Unadjusted Trial Balance. *Rice University. Source: Openstax CC BY NC-SA Long Description*

Let's now take a look at the T-accounts and unadjusted trial balance for Printing Plus to see how the information is transferred from the T-accounts to the unadjusted trial balance.

For example, Cash has a final balance of $24,800 on the debit side. This balance is transferred to the Cash account in the debit column on the unadjusted trial balance. Accounts

Receivable ($1,200), Supplies ($500), Equipment ($3,500), Dividends ($100), Salaries Expense ($3,600), and Utility Expense ($300) also have debit final balances in their T-accounts, so this information will be transferred to the debit column on the unadjusted trial balance. Accounts Payable ($500), Unearned Revenue ($4,000), Common Stock ($20,000) and Service Revenue ($9,500) all have credit final balances in their T-accounts. These credit balances would transfer to the credit column on the unadjusted trial balance.

Once all balances are transferred to the unadjusted trial balance, we will sum each of the debit and credit columns. The debit and credit columns both total $34,000, which means they are equal and in balance. However, just because the column totals are equal and in balance, we are still not guaranteed that a mistake is not present.

PRINTING PLUS
Unadjusted Trial Balance
January 31, 2019

Account	Debit	Credit
Cash	$24,800	
Accounts Receivable	1,200	
Supplies	500	
Equipment	3,500	
Accounts Payable		$ 500
Unearned Revenue		4,000
Common Stock		20,000
Dividends	100	
Service Revenue		9,500
Salaries Expense	3,600	
Utility Expense	300	
Total	$34,000	$34,000

Figure 1.9 Unadjusted Trial Balance. *Rice University. Source: Openstax CC BY NC-SA Long Description*

Long Descriptions

Printing Plus, Unadjusted Trial Balance, January 31, 2019. Debit accounts: Cash $24,800; Accounts Receivable 1,200; Supplies 500; Equipment 3,500; Dividends 100; Salaries Expense 3,600; Utility Expense 300; Total Debits $34,000. Credit accounts: Accounts Payable 500; Unearned Revenue 4,000; Common Stock 20,000; Service Revenue 9,500; Total Credits $34,000. To the right of the unadjusted trial balance are eleven T-accounts with lines connecting the balances of the T-accounts to the account balances on the unadjusted trial balance. The eleven T-accounts, in order, are: Cash, with a debit entry dated January 3 for 20,000, a debit entry dated January 9 for 4,000, a debit entry dated January 17 for 2,800, a debit entry dated January 23 for 5,500, a credit entry dated January 12 for 300, a credit entry dated January 14 for 100, a credit entry dated January 18 for 3,500, a credit entry dated January 20 for 3,600, and a balance of 24,800. Accounts Receivable, with a debit entry dated January 10 for 5,500, a debit entry dated January 27 for 1,200, a credit entry dated January 23 for 5,500, and a balance of 1,200. Supplies, with a debit entry dated January 30 for 500, and a balance of 500. Equipment, with a debit entry dated January 5 for 3,500, and a balance of 3,500. Accounts Payable, with a debit entry dated January 18 for 3,500, a credit entry dated January 9 for 3,500, a credit entry dated January 30 for 500, and a balance of 500. Unearned Revenue, with a credit entry dated January 9 for 4,000, and a balance of 4,000. Common Stock, with a credit entry dated January 3 for 20,000, and a balance of 20,000. Dividends, with a debit entry dated January 14 for 100, and a balance of 100. Service Revenue, with a credit entry dated January 10 for 5,500, a credit entry dated January 17 for 2,800, a credit entry dated January 27 for 1,200, and a balance of 9,500. Salaries Expense, with a debit entry dated January 20 for 3,600, and a balance of 3,600. Utility Expense, with a debit entry dated January 12 for 300, and a balance of 300. Return

Printing Plus, Unadjusted Trial Balance, January 31, 2019. Debit accounts: Cash, $24,800; Accounts Receivable, 1,200; Supplies, 500; Equipment, 3,500; Dividends, 100; Salaries Expense, 3,600; Utility Expense, 300; Total Debits, $34,000. Credit accounts: Accounts Payable, 500; Unearned Revenue, 4,000; Common Stock, 20,000; Service Revenue, 9,500; Total Credits, $34,000. Return

1.7 Accounting Principles, Concepts and Assumptions

The Financial Accounting Standards Board (F.A.S.B.) is an independent, nonprofit organization that sets the standards for financial accounting and reporting, including generally accepted accounting principles (G.A.A.P.), for both public- and private-sector businesses in the United States.

GAAP are the concepts, standards, and rules that guide the preparation and presentation of financial statements. If US accounting rules are followed, the accounting rules are called US GAAP. International accounting rules are called International Financial Reporting Standards (I.F.R.S.). Publicly traded companies (those that offer their shares for sale on exchanges in the United States) have the reporting of their financial operations regulated by the Securities and Exchange Commission (S.E.C.).

The SEC is an independent federal agency that is charged with protecting the interests of investors, regulating stock markets, and ensuring companies adhere to GAAP requirements. By having proper accounting standards such as US GAAP or IFRS, information presented publicly is considered comparable and reliable. As a result, financial statement users are more informed when making decisions. The SEC not only enforces the accounting rules but also delegates the process of setting standards for US GAAP to the FASB.

Some companies that operate on a global scale may be able to report their financial statements using IFRS. The SEC regulates the financial reporting of companies selling their shares in the United States, whether US GAAP or IFRS are used.

The basics of accounting discussed in this chapter are the same under either set of guidelines.

The Conceptual Framework

The FASB uses a conceptual framework, which is a set of concepts that guide financial reporting. These concepts can help ensure information is comparable and reliable to stakeholders. Guidance may be given on how to report transactions, measurement requirements, and application on financial statements, among other things.[1]

The conceptual framework sets the basis for accounting standards set by rule-making bodies that govern how the financial statements are prepared. Here are a few of the principles, assumptions, and concepts that provide guidance in developing GAAP.

Revenue Recognition Principle

The revenue recognition principle directs a company to recognize revenue in the period in which it is earned; revenue is not considered earned until a product or service has been provided. This means the period of time in which you performed the service or gave the customer the product is the period in which revenue is recognized.

There also does not have to be a correlation between when cash is collected and when revenue is recognized. A customer may not pay for the service on the day it was provided. Even though the customer has not yet paid cash, there is a reasonable expectation that the customer will pay in the future. Since the company has provided the service, it would

recognize the revenue as earned, even though cash has yet to be collected.

For example, Lynn Sanders owns a small printing company, Printing Plus. She completed a print job for a customer on August 10. The customer did not pay cash for the service at that time and was billed for the service, paying at a later date. When should Lynn recognize the revenue, on August 10 or at the later payment date? Lynn should record revenue as earned on August 10. She provided the service to the customer, and there is a reasonable expectation that the customer will pay at the later date.

Expense Recognition (Matching) Principle

The expense recognition principle (also referred to as the matching principle) states that we must match expenses with associated revenues in the period in which the revenues were earned. A mismatch in expenses and revenues could be an understated net income in one period with an overstated net income in another period. There would be no reliability in statements if expenses were recorded separately from the revenues generated.

For example, if Lynn earned printing revenue in April, then any associated expenses to the revenue generation (such as paying an employee) should be recorded on the same income statement. The employee worked for Lynn in April, helping her earn revenue in April, so Lynn must match the expense with the revenue by showing both on the April income statement.

Cost Principle

The cost principle, also known as the historical cost principle,

states that virtually everything the company owns or controls (*assets*) must be recorded at its value at the date of acquisition. For most assets, this value is easy to determine as it is the price agreed to when buying the asset from the vendor. There are some exceptions to this rule, but always apply the cost principle unless FASB has specifically stated that a different valuation method should be used in a given circumstance.

The primary exceptions to this historical cost treatment, at this time, are financial instruments, such as stocks and bonds, which might be recorded at their fair market value. This is called mark-to-market accounting or fair value accounting and is more advanced than the general basic concepts underlying the introduction to basic accounting concepts; therefore, it is addressed in more advanced accounting courses.

Once an asset is recorded on the books, the value of that asset must remain at its historical cost, even if its value in the market changes. For example, Lynn Sanders purchases a piece of equipment for $40,000. She believes this is a bargain and perceives the value to be more at $60,000 in the current market. Even though Lynn feels the equipment is worth $60,000, she may only record the cost she paid for the equipment of $40,000.

Full Disclosure Principle

The full disclosure principle states that a business must report any business activities that could affect what is reported on the financial statements. These activities could be nonfinancial in nature or be supplemental details not readily available on the main financial statement. Some examples of this include any pending litigation, acquisition information, methods used to calculate certain figures, or stock options. These disclosures are usually recorded in footnotes on the statements, or in addenda to the statements.

Separate Entity Concept

The separate entity concept prescribes that a business may only report activities on financial statements that are specifically related to company operations, not those activities that affect the owner personally. This concept is called the separate entity concept because the business is considered an entity separate and apart from its owner(s).

For example, Lynn Sanders purchases two cars; one is used for personal use only, and the other is used for business use only. According to the separate entity concept, Lynn may record the purchase of the car used by the company in the company's accounting records, but not the car for personal use.

Conservatism

This concept is important when valuing a transaction for which the dollar value cannot be as clearly determined, as when using the cost principle. Conservatism states that if there is uncertainty in a potential financial estimate, a company should err on the side of caution and report the most conservative amount. This would mean that any uncertain or estimated expenses/losses should be recorded, but uncertain or estimated revenues/gains should not. This understates net income, therefore reducing profit. This gives stakeholders a more reliable view of the company's financial position and does not overstate income.

Monetary Measurement Concept

In order to record a transaction, we need a system of monetary

measurement, or a *monetary unit* by which to value the transaction. In the United States, this monetary unit is the US dollar. Without a dollar amount, it would be impossible to record information in the financial records. It also would leave stakeholders unable to make financial decisions, because there is no comparability measurement between companies. This concept ignores any change in the purchasing power of the dollar due to inflation.

Going Concern Assumption

The going concern assumption assumes a business will continue to operate in the foreseeable future. A common time frame might be twelve months. However, one should presume the business is doing well enough to continue operations unless there is evidence to the contrary. For example, a business might have certain expenses that are paid off (or reduced) over several time periods. If the business will stay operational in the foreseeable future, the company can continue to recognize these long-term expenses over several time periods. Some red flags that a business may no longer be a going concern are defaults on loans or a sequence of losses.

Time Period Assumption

The time period assumption states that a company can present useful information in shorter time periods, such as years, quarters, or months. The information is broken into time frames to make comparisons and evaluations easier. The information will be timely and current and will give a meaningful picture of how the company is operating.

For example, a school year is broken down into semesters

or quarters. After each semester or quarter, your grade point average (GPA) is updated with new information on your performance in classes you completed. This gives you timely grading information with which to make decisions about your schooling.

A potential or existing investor wants timely information by which to measure the performance of the company, and to help decide whether to invest. Because of the time period assumption, we need to be sure to recognize revenues and expenses in the proper period. This might mean allocating costs over more than one accounting or reporting period.

The use of the principles, assumptions, and concepts in relation to the preparation of financial statements is better understood when looking at the full accounting cycle and its relation to the detailed process required to record business activities (Figure 1.10).

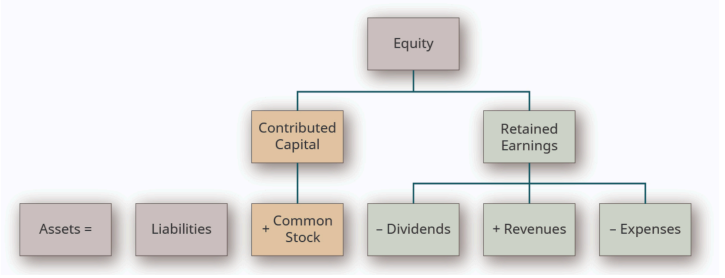


Figure 1.10 GAAP Accounting Standards Connection Tree. *Rice University. Source: Openstax CC BY NC-SA Long Description*

CONCEPTS IN PRACTICE

Tax Cuts and Jobs Act

In 2017, the US government enacted the Tax Cuts and Jobs

Act. As a result, financial stakeholders needed to resolve several issues surrounding the standards from GAAP principles and the FASB. The issues were as follows: "Current Generally Accepted Accounting Principles (GAAP) requires that deferred tax liabilities and assets be adjusted for the effect of a change in tax laws or rates," and "implementation issues related to the Tax Cuts and Jobs Act and income tax reporting."[2]

In response, the FASB issued updated guidance on both issues. You can explore these revised guidelines at the FASB website.

Accounting Principles and Assumptions Regulating Revenue Recognition

Revenue and expense recognition timing is critical to transparent financial presentation. GAAP governs recognition for publicly traded companies. Even though GAAP is required only for public companies, to display their financial position most accurately, private companies should manage their financial accounting using its rules. Two principles governed by GAAP are the revenue recognition principle and the matching principle. Both the revenue recognition principle and the matching principle give specific direction on revenue and expense reporting.

The revenue recognition principle, which states that companies must recognize revenue in the period in which it is earned, instructs companies to recognize revenue when a four-step process is completed. This may not necessarily be when cash is collected. Revenue can be recognized when all of the following criteria have been met:

- There is credible evidence that an arrangement exists.

- Goods have been delivered or services have been performed.
- The selling price or fee to the buyer is fixed or can be reasonably determined.
- There is reasonable assurance that the amount owed to the seller is collectible.

The accrual accounting method aligns with this principle, and it records transactions related to revenue earnings as they occur, not when cash is collected. The revenue recognition principle may be updated periodically to reflect more current rules for reporting.

For example, a landscaping company signs a $600 contract with a customer to provide landscaping services for the next six months (assume the landscaping workload is distributed evenly throughout the six months). The customer sets up an in-house credit line with the company, to be paid in full at the end of the six months. The landscaping company records revenue earnings each month and provides service as planned. To align with the revenue recognition principle, the landscaping company will record one month of revenue ($100) each month as earned; they provided service for that month, even though the customer has not yet paid cash for the service.

Let's say that the landscaping company also sells gardening equipment. It sells a package of gardening equipment to a customer who pays on credit. The landscaping company will recognize revenue immediately, given that they provided the customer with the gardening equipment (product), even though the customer has not yet paid cash for the product.

Accrual accounting also incorporates the matching principle (otherwise known as the expense recognition principle), which instructs companies to record expenses related to revenue generation in the period in which they are incurred. The principle also requires that any expense not directly related to revenues be reported in an appropriate

manner. For example, assume that a company paid $6,000 in annual real estate taxes. The principle has determined that costs cannot effectively be allocated based on an individual month's sales; instead, it treats the expense as a period cost. In this case, it is going to record 1/12 of the annual expense as a monthly period cost. Overall, the "matching" of expenses to revenues projects a more accurate representation of company financials. When this matching is not possible, then the expenses will be treated as period costs.

For example, when the landscaping company sells the gardening equipment, there are costs associated with that sale, such as the costs of materials purchased or shipping charges. The cost is reported in the same period as revenue associated with the sale. There cannot be a mismatch in reporting expenses and revenues; otherwise, financial statements are presented unfairly to stakeholders. Misreporting has a significant impact on company stakeholders. If the company delayed reporting revenues until a future period, net income would be understated in the current period. If expenses were delayed until a future period, net income would be overstated.

CONCEPTS IN PRACTICE

Gift Card Revenue Recognition

Gift cards have become an essential part of revenue generation and growth for many businesses. Although they are practical for consumers and low cost to businesses, navigating revenue recognition guidelines can be difficult. Gift cards with expiration dates require that revenue recognition be delayed

until customer use or expiration. However, most gift cards now have no expiration date. So, when do you recognize revenue?

Companies may need to provide an estimation of projected gift card revenue and usage during a period based on past experience or industry standards. There are a few rules governing reporting. If the company determines that a portion of all of the issued gift cards will never be used, they may write this off to income. In some states, if a gift card remains unused, in part or in full, the unused portion of the card is transferred to the state government. It is considered unclaimed property for the customer, meaning that the company cannot keep these funds as revenue because, in this case, they have reverted to the state government.

Long Description

Hierarchical group of boxes representing the organizations that create generally accepted accounting principles (GAAP) and the principles, conventions, assumptions, and concepts that support GAAP. The top box is labeled SEC (enforces GAAP). The box below that is labeled FASB (sets GAAP). The box below that is labeled GAAP Accounting Standards. Below that are four boxes labeled left to right: Expense Recognition Principle; Full Disclosure Principle; Conservatism Convention; Going Concern Assumption. Below that are five boxes labeled left to right: Revenue Recognition Principle; Cost Principle; Separate Entity Concept; Monetary Measurement Concept; Time Period Assumption. Return

Footnotes

1 Financial Accounting Standards Board. “The Conceptual Framework.” http://www.fasb.org/jsp/FASB/Page/BridgePage&cid=1176168367774

2 Financial Accounting Standards Board (FASB). “Accounting for the Tax Cuts and Jobs Act.” https://www.fasb.org/taxcutsjobsact#section_1

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1.8 The Accounting Cycle

Analyzing and recording transactions represent the first steps in one continuous process known as the accounting cycle. The accounting cycle is a step-by-step process to record business activities and events to keep financial records up to date. The process occurs over one accounting period and will begin the cycle again in the following period. A period is one operating cycle of a business, which could be a month, quarter, or year. Review the accounting cycle in Figure 1.11.

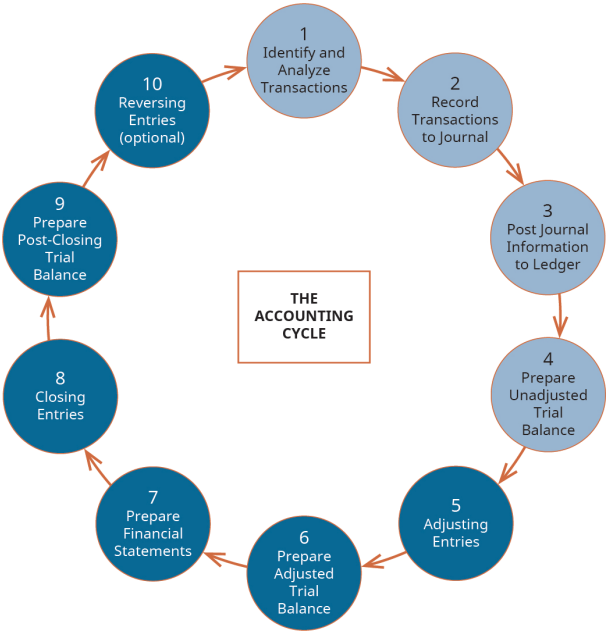


***Figure 1.11 The Accounting Cycle**. Rice University. Source: Openstax CC BY NC-SA Long Description*

As you can see, the cycle begins with identifying and analyzing

transactions, and culminates in reversing entries (which we do not cover in this textbook). The entire cycle is meant to keep financial data organized and easily accessible to both internal and external users of information. In this chapter, we focus on the first four steps in the accounting cycle: identify and analyze transactions, record transactions to a journal, post journal information to a ledger, and prepare an unadjusted trial balance.

In The Adjustment Process we review steps 5, 6, and 7 in the accounting cycle: record adjusting entries, prepare an adjusted trial balance, and prepare financial statements. In Completing the Accounting Cycle, we review steps 8 and 9: closing entries and prepare a post-closing trial balance. As stated previously, we do not cover reversing entries.

First Four Steps in the Accounting Cycle

The first four steps in the accounting cycle are (1) identify and analyze transactions, (2) record transactions to a journal, (3) post journal information to a ledger, and (4) prepare an unadjusted trial balance. We begin by introducing the steps and their related documentation.

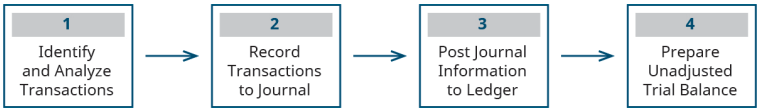


Figure 1.12 The first four steps in the accounting cycle. *Rice University. Source: Openstax CC BY NC-SA*

These first four steps set the foundation for the recording process.

Step 1. Identifying and analyzing transactions is the first step in the process. This takes information from original sources or

activities and translates that information into usable financial data. An original source is a traceable record of information that contributes to the creation of a business transaction. For example, a sales invoice is considered an original source. Activities would include paying an employee, selling products, providing a service, collecting cash, borrowing money, and issuing stock to company owners. Once the original source has been identified, the company will analyze the information to see how it influences financial records.

Let's say that Mark Summers of Supreme Cleaners provides cleaning services to a customer. He generates an invoice for $200, the amount the customer owes, so he can be paid for the service. This sales receipt contains information such as how much the customer owes, payment terms, and dates. This sales receipt is an original source containing financial information that creates a business transaction for the company.

Step 2. The second step in the process is recording transactions to a journal. This takes analyzed data from step 1 and organizes it into a comprehensive record of every company transaction. A transaction is a business activity or event that has an effect on financial information presented on financial statements. The information to record a transaction comes from an original source. A journal (also known as the book of original entry or general journal) is a record of all transactions.

For example, in the previous transaction, Supreme Cleaners had the invoice for $200. Mark Summers needs to record this $200 in his financial records. He needs to choose what accounts represent this transaction, whether or not this transaction will increase or decreases the accounts, and how that impacts the accounting equation before he can record the transaction in his journal. He needs to do this process for every transaction occurring during the period.

Figure 1.13 includes information such as the date of the transaction, the accounts required in the journal entry, and columns for debits and credits.

GENERAL JOURNAL			
Date	**Account Title**	**Debit**	**Credit**

Figure 1.13 General Journal. *Rice University. Source: Openstax CC BY NC-SA*

Step 3. The third step in the process is posting journal information to a ledger. Posting takes all transactions from the journal during a period and moves the information to a general ledger, or ledger. As you've learned, account balances can be represented visually in the form of T-accounts.

Returning to Supreme Cleaners, Mark identified the accounts needed to represent the $200 sale and recorded them in his journal. He will then take the account information and move it to his general ledger. All of the accounts he used during the period will be shown on the general ledger, not only those accounts impacted by the $200 sale.

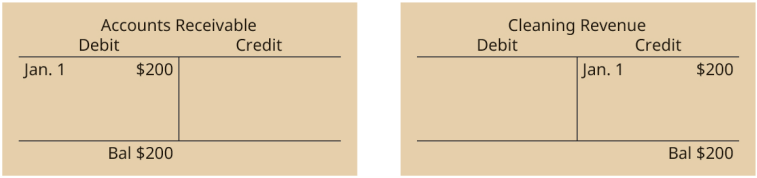


Figure 1.14 General Ledger in T-Account Form. *Rice University. Source: Openstax CC BY NC-SA*

Step 4. The fourth step in the process is to prepare an unadjusted trial balance. This step takes information from the general ledger and transfers it onto a document showing all account balances, and ensuring that debits and credits for the period balance (debit and credit totals are equal).

Mark Summers from Supreme Cleaners needs to organize

all of his accounts and their balances, including the $200 sale, onto a trial balance. He also needs to ensure his debits and credits are balanced at the culmination of this step.

SUPREME CLEAN Trial Balance April 30, 2018		
Account Title	**Debit**	**Credit**
Cash	XXX	
Accounts receivable	XXX	
Office supplies	XXX	
Prepaid insurance	XXX	
Equipment	XXX	
Accounts payable		XXX
Unearned cleaning revenue		XXX
Common stock		XXX
Dividends	XXX	
Cleaning revenue		XXX
Gas expense	XXX	
Advertising expense	XXX	
	XXX	XXX

1.15 Unadjusted Trial Balance. *Rice University. Source: Openstax CC BY NC-SA Long Description*

It is important to note that recording the entire process requires a strong attention to detail. Any mistakes early on in the process can lead to incorrect reporting information on financial statements. If this occurs, accountants may have to go all the way back to the beginning of the process to find their error. Make sure that as you complete each step, you are careful and really take the time to understand how to record information and why you are recording it. In the next section,

you will learn how the accounting equation is used to analyze transactions.

CONCEPTS IN PRACTICE

Forensic Accounting

Ever dream about working for the Federal Bureau of Investigation (FBI)? As a forensic accountant, that dream might just be possible. A forensic accountant investigates financial crimes, such as tax evasion, insider trading, and embezzlement, among other things. Forensic accountants review financial records looking for clues to bring about charges against potential criminals. They consider every part of the accounting cycle, including original source documents, looking through journal entries, general ledgers, and financial statements. They may even be asked to testify to their findings in a court of law.

To be a successful forensic accountant, one must be detailed, organized, and naturally inquisitive. This position will need to retrace the steps a suspect may have taken to cover up fraudulent financial activities. Understanding how a company operates can help identify fraudulent activities that veer from the company's position. Some of the best forensic accountants have put away major criminals such as Al Capone, Bernie Madoff, Ken Lay, and Ivan Boesky.



An interactive H5P element has been excluded from this version of the text. You can view it online

here:
https://psu.pb.unizin.org/acctg211/?p=99#h5p-7

Long Description

A large circle labeled, in the center, The Accounting Cycle. The large circle consists of 10 smaller circles with arrows pointing from one smaller circle to the next one. Circles 1 through 4 are highlighted. The smaller circles are labeled, in clockwise order: 1 Identify and Analyze Transactions; 2 Record Transactions to Journal; 3 Post Journal Information to Ledger; 4 Prepare Unadjusted Trial Balance; 5 Adjusting Entries; 6 Prepare Adjusted Trial Balance; 7 Prepare Financial Statements; 8 Closing Entries; 9 Prepare Post-Closing Trial Balance; 10 Reversing Entries (optional). Return

Supreme Clean, Trial Balance, April 30, 2018. The balance of each account, whether debit or credit, is listed as XXX. Debit balance accounts are listed as: Cash, Accounts receivable, Office supplies, Prepaid insurance; Equipment, Dividends, Gas expense, and Advertising expense. Credit balance accounts are listed as: Accounts payable, Unearned cleaning revenue, Common stock, and Cleaning revenue. Return

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- 2 T-accounts © Rice University is licensed under a CC BY-NC-SA (Attribution NonCommercial ShareAlike) license

- fig2.10SupCln © Rice University is licensed under a CC BY-NC-SA (Attribution NonCommercial ShareAlike) license

1.9 The Adjustment Process

Following the steps of analyzing transactions, recording entries, posting to ledgers and creating the trial balance the accounting cycle continues with steps 5-7 of the accounting cycle.

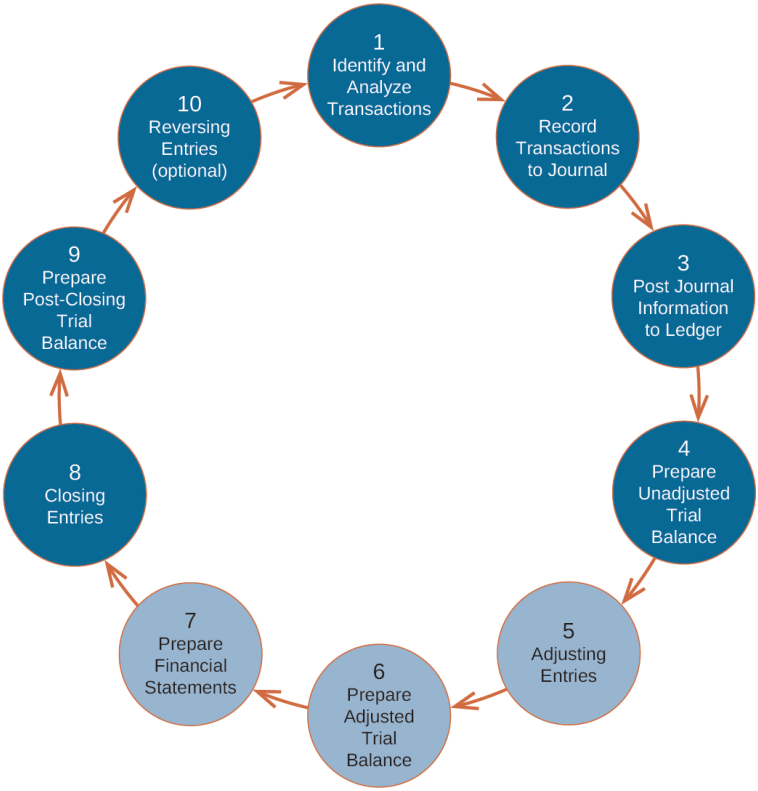


Figure 1.16 The Accounting Cycle. *Rice University. Source: Openstax CC BY NC-SA. Long Description*

In this segment, we review steps 5, 6, and 7 in the accounting cycle: record adjusting entries, prepare an adjusted trial balance, and prepare financial statements.

As we progress through these steps, you learn why the trial balance in this phase of the accounting cycle is referred to as an "adjusted" trial balance. We also discuss the purpose of adjusting entries and the accounting concepts supporting their need. One of the first concepts we discuss is accrual accounting.

Accrual Accounting

Public companies reporting their financial positions use either US generally accepted accounting principles (GAAP) or International Financial Reporting Standards (IFRS), as allowed under the Securities and Exchange Commission (SEC) regulations. Also, companies, public or private, using US GAAP or IFRS prepare their financial statements using the rules of accrual accounting. Recall that accrual basis accounting prescribes that revenues and expenses must be recorded in the accounting period in which they were earned or incurred, no matter when cash receipts or payments occur. It is because of accrual accounting that we have the *revenue recognition principle* and the *expense recognition principle* (also known as the *matching principle*).

The accrual method is considered to better match revenues and expenses and standardizes reporting information for comparability purposes. Having comparable information is important to external users of information trying to make investment or lending decisions, and to internal users trying to make decisions about company performance, budgeting, and growth strategies.

Some nonpublic companies may choose to use cash basis

accounting rather than accrual basis accounting to report financial information. Recall that cash basis accounting is a method of accounting in which transactions are not recorded in the financial statements until there is an exchange of cash. Cash basis accounting sometimes delays or accelerates revenue and expense reporting until cash receipts or outlays occur. With this method, cash flows are used to measure business performance in a given period and can be simpler to track than accrual basis accounting.

There are several other accounting methods or concepts that accountants will sometimes apply. The first is modified accrual accounting, which is commonly used in governmental accounting and merges accrual basis and cash basis accounting. The second is tax basis accounting that is used in establishing the tax effects of transactions in determining the tax liability of an organization.

One fundamental concept to consider related to the accounting cycle—and to accrual accounting in particular—is the idea of the accounting period.

The Accounting Period

As we discussed, accrual accounting requires companies to report revenues and expenses in the accounting period in which they were earned or incurred. An accounting period breaks down company financial information into specific time spans, and can cover a month, a quarter, a half-year, or a full year. Public companies governed by GAAP are required to present quarterly (three-month) accounting period financial statements called 10-Qs. However, most public and private companies keep monthly, quarterly, and yearly (annual) period information. This is useful to users needing up-to-date financial data to make decisions about company investment and growth. When the company keeps yearly information, the

year could be based on a fiscal or calendar year. This is explained shortly.

The Fiscal Year and the Calendar Year

A company may choose its yearly reporting period to be based on a calendar or fiscal year. If a company uses a calendar year, it is reporting financial data from January 1 to December 31 of a specific year. This may be useful for businesses needing to coincide with a traditional yearly tax schedule. It can also be easier to track for some businesses without formal reconciliation practices, and for small businesses.

A fiscal year is a twelve-month reporting cycle that can begin in any month and records financial data for that consecutive twelve-month period. For example, a business may choose its fiscal year to begin on April 1, 2019, and end on March 31, 2020. This can be common practice for corporations and may best reflect the operational flow of revenues and expenses for a particular business. In addition to annual reporting, companies often need or choose to report financial statement information in interim periods.

Interim Periods

An interim period is any reporting period shorter than a full year (fiscal or calendar). This can encompass monthly, quarterly, or half-year statements. The information contained on these statements is timelier than waiting for a yearly accounting period to end. The most common interim period is three months, or a quarter. For companies whose common stock is traded on a major stock exchange, meaning these are *publicly traded* companies, quarterly statements must be

filed with the SEC on a Form 10-Q. The companies must file a Form 10-K for their annual statements. As you've learned, the SEC is an independent agency of the federal government that provides oversight of public companies to maintain fair representation of company financial activities for investors to make informed decisions.

In order for information to be useful to the user, it must be timely—that is, the user has to get it quickly enough so it is relevant to decision-making. You may recall that this is the basis of the time period assumption in accounting. For example, a potential or existing investor wants timely information by which to measure the performance of the company, and to help decide whether to invest, to stay invested, or to sell their stockholdings and invest elsewhere. This requires companies to organize their information and break it down into shorter periods. Internal and external users can then rely on the information that is both timely and relevant to decision-making.

The accounting period a company chooses to use for financial reporting will impact the types of adjustments they may have to make to certain accounts.

Why Some Accounts Have Incorrect Balances on the Trial Balance

The unadjusted trial balance may have incorrect balances in some accounts. Recall the trial balance from Analyzing and Recording Transactions for the example company, Printing Plus.

PRINTING PLUS Unadjusted Trial Balance January 31, 2019		
Account	**Debit**	**Credit**
Cash	$24,800	
Accounts Receivable	1,200	
Supplies	500	
Equipment	3,500	
Accounts Payable		$ 500
Unearned Revenue		4,000
Common Stock		20,000
Dividends	100	
Service Revenue		9,500
Salaries Expense	3,600	
Utility Expense	300	
Total	$34,000	$34,000

Figure 1.17 Unadjusted Trial Balance for Printing Plus. *Rice University. Source: Openstax CC BY NC-SA. Long Description*

The trial balance for Printing Plus shows Supplies of $500, which were purchased on January 30. Since this is a new company, Printing Plus would more than likely use some of their supplies right away, before the end of the month on January 31. Supplies are only an asset when they are unused. If Printing Plus used some of its supplies immediately on January 30, then why is the full $500 still in the supply account on January 31? How do we fix this incorrect balance?

Similarly, what about Unearned Revenue? On January 9, the company received $4,000 from a customer for printing services to be performed. The company recorded this as a liability because it received payment without providing the service. To clear this liability, the company must perform the

service. Assume that as of January 31 some of the printing services have been provided. Is the full $4,000 still a liability? Since a portion of the service was provided, a change to unearned revenue should occur. The company needs to correct this balance in the Unearned Revenue account.

Having incorrect balances in Supplies and in Unearned Revenue on the company's January 31 trial balance is not due to any error on the company's part. The company followed all of the correct steps of the accounting cycle up to this point. So why are the balances still incorrect?

Journal entries are recorded when an activity or event occurs that triggers the entry. Usually the trigger is from an original source. Recall that an original source can be a formal document substantiating a transaction, such as an invoice, purchase order, cancelled check, or employee time sheet. Not every transaction produces an original source document that will alert the bookkeeper that it is time to make an entry.

When a company purchases supplies, the original order, receipt of the supplies, and receipt of the invoice from the vendor will all trigger journal entries. This trigger does not occur when using supplies from the supply closet. Similarly, for unearned revenue, when the company receives an advance payment from the customer for services yet provided, the cash received will trigger a journal entry. When the company provides the printing services for the customer, the customer will not send the company a reminder that revenue has now been earned. Situations such as these are why businesses need to make adjusting entries.

Long Description

A large circle labeled, in the center, The Accounting Cycle. The large circle consists of 10 smaller circles with arrows pointing

from one smaller circle to the next one. Circles 5, 6 and 7 are highlighted. The smaller circles are labeled, in clockwise order: 1 Identify and Analyze Transactions; 2 Record Transactions to Journal; 3 Post Journal Information to Ledger; 4 Prepare Unadjusted Trial Balance; 5 Adjusting Entries; 6 Prepare Adjusted Trial Balance; 7 Prepare Financial Statements; 8 Closing Entries; 9 Prepare Post-Closing Trial Balance; 10 Reversing Entries (optional). Return

Printing Plus, Unadjusted Trial Balance, January 31, 2019. Debit accounts: Cash, $24,800; Accounts Receivable, 1,200; Supplies, 500; Equipment, 3,500; Dividends, 100; Salaries Expense, 3,600; Utility Expense, 300; Total Debits, $34,000. Credit accounts: Accounts Payable, 500; Unearned Revenue, 4,000; Common Stock, 20,000; Service Revenue, 9,500; Total Credits, $34,000. Return

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- Unadjusted Trial Balance for Printing Plus © Rice Unversity is licensed under a CC BY-NC-SA (Attribution NonCommercial ShareAlike) license

1.10 Adjusting Entry - Examples

Before beginning adjusting entry examples, let's consider some rules governing adjusting entries:

- Every adjusting entry will have at least one income statement account and one balance sheet account.
- Cash will never be in an adjusting entry.
- The adjusting entry records the change in amount that occurred during the period.

What are "income statement" and "balance sheet" accounts? Income statement accounts include revenues and expenses. Balance sheet accounts are assets, liabilities, and stockholders' equity accounts, since they appear on a balance sheet. The second rule tells us that cash can never be in an adjusting entry. This is true because paying or receiving cash triggers a journal entry. This means that every transaction with cash will be recorded at the time of the exchange. We will not get to the adjusting entries and have cash paid or received which has not already been recorded. If accountants find themselves in a situation where the cash account must be adjusted, the necessary adjustment to cash will be a *correcting entry* and not an adjusting entry.

With an adjusting entry, the amount of change occurring during the period is recorded. For example, if the supplies account had a $300 balance at the beginning of the month and $100 is still available in the supplies account at the end of the month, the company would record an adjusting entry for the $200 used during the month (300 – 100). Similarly for

unearned revenues, the company would record how much of the revenue was earned during the period.

Recording Common Types of Adjusting Entries

Recall the transactions for Printing Plus discussed in Analyzing and Recording Transactions.

Table 1.2 Transactions for Printing Plus. By: Rice University OpenStax CC BY-NC-SA 4.0

Date	Transactions
Jan. 3, 2019	issues $20,000 shares of common stock for cash
Jan. 5, 2019	purchases equipment on account for $3,500, payment due within the month
Jan. 9, 2019	receives $4,000 cash in advance from a customer for services not yet rendered
Jan. 10, 2019	provides $5,500 in services to a customer who asks to be billed for the services
Jan. 12, 2019	pays a $300 utility bill with cash
Jan. 14, 2019	distributed $100 cash in dividends to stockholders
Jan. 17, 2019	receives $2,800 cash from a customer for services rendered
Jan. 18, 2019	paid in full, with cash, for the equipment purchase on January 5
Jan. 20, 2019	paid $3,600 cash in salaries expense to employees
Jan. 23, 2019	received cash payment in full from the customer on the January 10 transaction
Jan. 27, 2019	provides $1,200 in services to a customer who asks to be billed for the services
Jan. 30, 2019	purchases supplies on account for $500, payment due within three months

On January 31, 2019, Printing Plus makes adjusting entries for the following transactions.

1. On January 31, Printing Plus took an inventory of its supplies and discovered that $100 of supplies had been used during the month.
2. The equipment purchased on January 5 depreciated $75 during the month of January.
3. Printing Plus performed $600 of services during January for the customer from the January 9 transaction.
4. Reviewing the company bank statement, Printing Plus discovers $140 of interest earned during the month of January that was previously uncollected and unrecorded.
5. Employees earned $1,500 in salaries for the period of January 21–January 31 that had been previously unpaid and unrecorded.

We now record the adjusting entries from January 31, 2019, for Printing Plus.

Transaction 13: On January 31, Printing Plus took an inventory of its supplies and discovered that $100 of supplies had been used during the month.

Analysis:

- $100 of supplies were used during January. Supplies is an asset that is decreasing (credit).
- Supplies is a type of prepaid expense that, when used, becomes an expense. Supplies Expense would increase (debit) for the $100 of supplies used during January.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Supplies Expense	100	
	Supplies		100
	To recognize supply usage for January		

Impact on the financial statements: Supplies is a balance sheet account, and Supplies Expense is an income statement account. This satisfies the rule that each adjusting entry will contain an income statement and balance sheet account. We

see total assets decrease by $100 on the balance sheet. Supplies Expense increases overall expenses on the income statement, which reduces net income.

Assets	=	Liabilities	+	Stockholders' Equity
–$100	=	+$0	+	–$100
–$100	=	$0	+	–$100

Transaction 14: The equipment purchased on January 5 depreciated $75 during the month of January.

Analysis:

- Equipment lost value in the amount of $75 during January. This depreciation will impact the Accumulated Depreciation–Equipment account and the Depreciation Expense–Equipment account. While we are not doing depreciation calculations here, you will come across more complex calculations in the future.
- Accumulated Depreciation–Equipment is a contra asset account (contrary to Equipment) and increases (credit) for $75.
- Depreciation Expense–Equipment is an expense account that is increasing (debit) for $75.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Depreciation Expense: Equipment	75	
	Accumulated Depreciation: Equipment		75
	To recognize equipment depreciation for January		

Impact on the financial statements: Accumulated Depreciation–Equipment is a contra account to Equipment. When calculating the book value of Equipment, Accumulated Depreciation–Equipment will be deducted from the original cost of the equipment. Therefore, total assets will decrease by $75 on the balance sheet. Depreciation Expense will increase

overall expenses on the income statement, which reduces net income.

Assets	=	Liabilities	+	Stockholders' Equity
–$75	=	+$0	+	–$75
–$75	=	$0	+	–$75

Transaction 15: Printing Plus performed $600 of services during January for the customer from the January 9 transaction.

Analysis:

- The customer from the January 9 transaction gave the company $4,000 in advanced payment for services. By the end of January the company had earned $600 of the advanced payment. This means that the company still has yet to provide $3,400 in services to that customer.
- Since some of the unearned revenue is now earned, Unearned Revenue would decrease. Unearned Revenue is a liability account and decreases on the debit side.
- The company can now recognize the $600 as earned revenue. Service Revenue increases (credit) for $600.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Unearned Revenue	600	
	Service Revenue		600
	To recognize revenue earned from January 9 transaction		

Impact on the financial statements: Unearned revenue is a liability account and will decrease total liabilities and equity by $600 on the balance sheet. Service Revenue will increase overall revenue on the income statement, which increases net income.

Assets	=	Liabilities	+	Stockholders' Equity
$0	=	–$600	+	+$600
$0	=	–$600	+	$600

Transaction 16: Reviewing the company bank statement, Printing Plus discovers $140 of interest earned during the month of January that was previously uncollected and unrecorded.

Analysis:

- Interest is revenue for the company on money kept in a savings account at the bank. The company only sees the bank statement at the end of the month and needs to record interest revenue that has not yet been collected or recorded.
- Interest Revenue is a revenue account that increases (credit) for $140.
- Since Printing Plus has yet to collect this interest revenue, it is considered a receivable. Interest Receivable increases (debit) for $140.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Interest Receivable	140	
	Interest Revenue		140
	To recognize interest revenue earned but not yet collected		

Impact on the financial statements: Interest Receivable is an asset account and will increase total assets by $140 on the balance sheet. Interest Revenue will increase overall revenue on the income statement, which increases net income.

Assets	=	Liabilities	+	Stockholder's Equity
+$140	=	$0	+	+$140
+$140	=	$0	+	+$140

Transaction 17: Employees earned $1,500 in salaries for the

period of January 21–January 31 that had been previously unpaid and unrecorded.

Analysis:

- Salaries have accumulated since January 21 and will not be paid in the current period. Since the salaries expense occurred in January, the expense recognition principle requires recognition in January.
- Salaries Expense is an expense account that is increasing (debit) for $1,500.
- Since the company has not yet paid salaries for this time period, Printing Plus owes the employees this money. This creates a liability for Printing Plus. Salaries Payable increases (credit) for $1,500.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Salaries Expense	1,500	
	Salaries Payable		1,500
	To recognize salaries expense but not yet paid		

Impact on the financial statements: Salaries Payable is a liability account and will increase total liabilities and equity by $1,500 on the balance sheet. Salaries expense will increase overall expenses on the income statement, which decreases net income.

Assets	=	Liabilities	+	Stockholder's Equity
$0	=	+$1,500	+	–$1,500
$0	=	+$1,500	+	–$1,500

Supplies Adjustments Tutorial (clickable link)

Unearned Revenue Adjustments Tutorial

[(clickable link)]

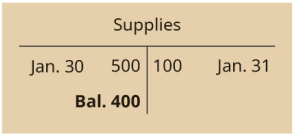
Posting Adjusting Entries

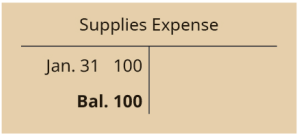
Once you have journalized all of your adjusting entries, the next step is posting the entries to your ledger. Posting adjusting entries is no different than posting the regular daily journal entries. T-accounts will be the visual representation for the Printing Plus general ledger.

Transaction 13: On January 31, Printing Plus took an inventory of its supplies and discovered that $100 of supplies had been used during the month.

Journal entry and T-accounts:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Supplies Expense	100	
	Supplies		100
	To recognize supply usage for January		





In the journal entry, Supplies Expense has a debit of $100. This is posted to the Supplies Expense T-account on the debit side (left side). Supplies has a credit balance of $100. This is posted to the Supplies T-account on the credit side (right side). You will notice there is already a debit balance in this account from the purchase of supplies on January 30. The $100 is deducted from $500 to get a final debit balance of $400.

Transaction 14: The equipment purchased on January 5 depreciated $75 during the month of January.

Journal entry and T-accounts:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Depreciation Expense: Equipment Accumulated Depreciation: Equipment *To recognize equipment depreciation for January*	75	75

Depreciation Expense: Equipment			
Jan. 31	75		
Bal. 75			

Accumulated Depreciation: Equipment			
		75	Jan. 31
		Bal. 75	

In the journal entry, Depreciation Expense–Equipment has a debit of $75. This is posted to the Depreciation Expense–Equipment T-account on the debit side (left side). Accumulated Depreciation–Equipment has a credit balance of $75. This is posted to the Accumulated Depreciation–Equipment T-account on the credit side (right side).

Transaction 15: Printing Plus performed $600 of services during January for the customer from the January 9 transaction.

Journal entry and T-accounts:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Unearned Revenue Service Revenue *To recognize revenue earned from January 9 transaction*	600	600

Unearned Revenue			
		4,000	Jan. 9
Jan. 31	600		
		Bal. 3,400	

Service Revenue			
		5,500	Jan. 10
		2,800	Jan. 17
		1,200	Jan. 27
		600	Jan. 31
		Bal. 10,100	

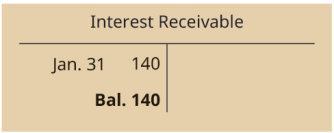
In the journal entry, Unearned Revenue has a debit of $600. This is posted to the Unearned Revenue T-account on the debit side (left side). You will notice there is already a credit balance in this account from the January 9 customer payment. The $600 debit is subtracted from the $4,000 credit to get a final balance

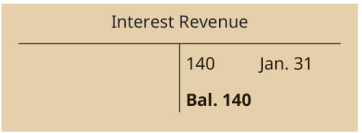
of $3,400 (credit). Service Revenue has a credit balance of $600. This is posted to the Service Revenue T-account on the credit side (right side). You will notice there is already a credit balance in this account from other revenue transactions in January. The $600 is added to the previous $9,500 balance in the account to get a new final credit balance of $10,100.

Transaction 16: Reviewing the company bank statement, Printing Plus discovers $140 of interest earned during the month of January that was previously uncollected and unrecorded.

Journal entry and T-accounts:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Interest Receivable	140	
	Interest Revenue		140
	To recognize interest revenue earned but not yet collected		





In the journal entry, Interest Receivable has a debit of $140. This is posted to the Interest Receivable T-account on the debit side (left side). Interest Revenue has a credit balance of $140. This is posted to the Interest Revenue T-account on the credit side (right side).

Transaction 17: Employees earned $1,500 in salaries for the period of January 21–January 31 that had been previously unpaid and unrecorded.

Journal entry and T-accounts:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Salaries Expense	1,500	
	Salaries Payable		1,500
	To recognize Salaries Payable earned but not yet collected		

Salaries Expense	
Jan. 31 1,500	
Bal. 1,500	

Salaries Payable	
	1,500 Jan. 31
	Bal. 1,500

In the journal entry, Salaries Expense has a debit of $1,500. This is posted to the Salaries Expense T-account on the debit side (left side). You will notice there is already a debit balance in this account from the January 20 employee salary expense. The $1,500 debit is added to the $3,600 debit to get a final balance of $5,100 (debit). Salaries Payable has a credit balance of $1,500. This is posted to the Salaries Payable T-account on the credit side (right side).

T-accounts Summary

Once all adjusting journal entries have been posted to T-accounts, we can check to make sure the accounting equation remains balanced. Following is a summary showing the T-accounts for Printing Plus including adjusting entries.

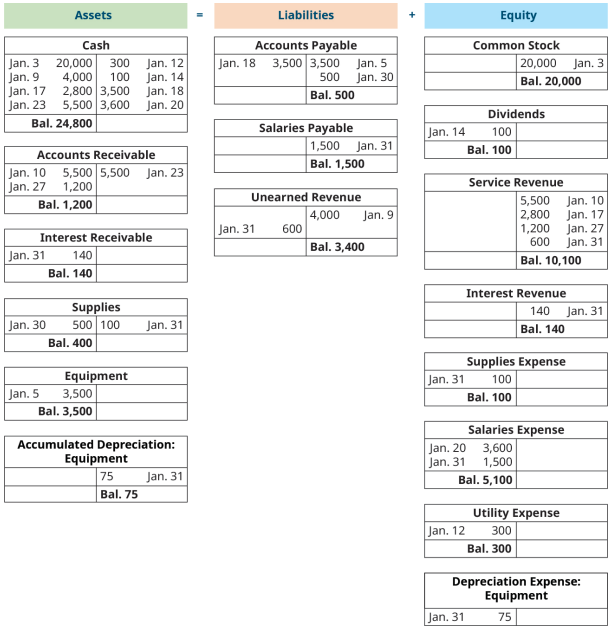


Figure 1.18 Printing Plus summary of T-accounts with Adjusting Entries. *Rice University. Source: Openstax CC BY NC-SA Long Description*

The sum on the assets side of the accounting equation equals $29,965, found by adding together the final balances in each asset account (24,800 + 1,200 + 140 + 400 + 3,500 – 75). To find the total on the liabilities and equity side of the equation, we need to find the difference between debits and credits. Credits on the liabilities and equity side of the equation total $35,640 (500 + 1,500 + 3,400 + 20,000 + 10,100 + 140). Debits on the liabilities and equity side of the equation total $5,675 (100 + 100 + 5,100 + 300 + 75). The difference between $35,640 – $5,675 = $29,965. Thus, the equation remains balanced with $29,965 on the asset side and $29,965 on the liabilities and equity side. Now that we have the T-account information, and have confirmed the accounting equation remains balanced, we can create the adjusted trial balance in our sixth step in the accounting cycle.

Long Description

Three columns headed Assets equal Liabilities plus Equity. The Asset column has six T-accounts. Cash, with a debit entry dated January 3 for 20,000, a debit entry dated January 9 for 4,000, a debit entry dated January 17 for 2,800, a debit entry dated January 23 for 5,500, a credit entry dated January 12 for 300, a credit entry dated January 14 for 100, a credit entry dated January 18 for 3,500, a credit entry dated January 20 for 3,600, and a debit balance of 24,800. Accounts Receivable, with a debit entry dated January 10 for 5,500, a debit entry dated January 27 for 1,200, a credit entry dated January 23 for 5,500, and a debit balance of 1,200. Interest Receivable, with a debit entry dated January 31 for 140, and a debit balance of 140. Supplies, with a debit entry dated January 30 for 500, a credit entry dated January 31 for 100, and a debit balance of 400. Equipment, with a debit entry dated January 5 for 3,500, and a debit balance of 3,500. Accumulated Depreciation: Equipment, with a credit entry dated January 31 for 75, and a credit balance of 75. The Liability column has three T-accounts. Accounts Payable, with a debit entry dated January 18 for 3,500, a credit entry dated January 5 for 3,500, a credit entry dated January 30 for 500, and a credit balance of 500. Salaries Payable, with a credit entry dated January 31 for 1,500, and a credit balance of 1,500. Unearned Revenue, with a credit entry dated January 9 for 4,000, a debit entry dated January 31 for 600, and a credit balance of 3,400. The Equity column has eight T-accounts. Common Stock, with a credit entry dated January 3 for 20,000, and a credit balance of 20,000. Dividends, with a debit entry dated January 14 for 100, and a debit balance of 100. Service Revenue, with a credit entry dated January 10 for 5,500, a credit entry dated January 17 for 2,800, a credit entry dated January 27 for 1,200, a credit entry dated January 31 for 600, and a credit balance of 10,000. Interest Revenue, with a credit entry dated January 31 for 140, and a credit balance of 140. Supplies

Expense, with a debit entry dated January 31 for 100, and a debit balance of 100. Salaries Expense, with a debit entry dated January 20 for 3,600, a debit entry dated January 31 for 1,500, and a debit balance of 5,100. Utility Expense, with a debit entry dated January 12 for 300, and a debt balance of 300. Depreciation Expense: Equipment, with a debit entry dated January 31 of 75, and a debit balance of 75. Return

1.11 Adjusting Entry- Practice

Practice

Interactive Practice #1

Supplies

Interactive Practice #2

Unearned Revenue

YOUR TURN

1. Prepaid Expenses: an asset represented by CASH PAID IN ADVANCE for future services/benefits to be received or utilized over time. Examples: supplies, prepaid rent, prepaid insurance.

1a. Supplies: Purchased $1000 supplies on account, on Jan. 2. At month end, $350 of supplies remain.

What is the entry to record the purchase of the supplies?

What is the adjustment needed? Record the usage of the supplies.

1b. Prepaid Insurance: Purchased a 6-month auto insurance policy, paying $1800, on Feb 1.

What is the entry to record the purchase of the insurance coverage?

What is the adjustment needed? Record the expired/used insurance as of the end of the month.

2. Accrued Revenues: If the company has provided services, then revenue should be recorded, even if the cash has not yet been received. Example: Joe Shmoe CPA observes his client's inventory count on Dec. 31. The value of these services is $700.

What is the adjustment needed? Record the value of services performed.

3. Accrued Expenses: If the company has used resources the related expense should be recorded, even if the cash payment for these items will not occur until the next period. Examples: salary expense and utilities expense.

3a. Salary Expense: The company pays employees a fixed salary. The weekly total for the salaries is $7500. The end of the period falls on a Monday.

What is the adjustment needed? Record (accrue) the salaries owed.

3b. Utility Expense: If the company uses electricity in December, but the December bill ($200) is not received until January- they must estimate an amount for December utility expense and record it.

What is the adjustment needed? Record the value of utility services used (amount owed).

4. Unearned Revenues: If the company RECEIVES CASH IN ADVANCE of the work or service to be performed, it results in a liability being recorded- Unearned Revenue. As the work is performed, the liability is settled and the company records revenue (Fees Earned). Example: Pete's Photos receives $800 for engagement and wedding photography services. The cash was received in March. The engagement photos are worth $200; the wedding portrait is worth $600. The engagement photos will be taken in May, the wedding portrait will be completed in September.

What is the journal entry to record the cash received?

What TWO adjusting entries are needed?

In May, to record the partial earning /value of work provided to date.

In September, to record the earning of the remaining amount

SOLUTION

1a. Prepaid Expenses: an asset represented by CASH PAID IN ADVANCE for future services/benefits to be received or utilized over time. Examples: supplies, prepaid rent, prepaid insurance. Supplies: Purchased $1000 supplies on account on Jan. 2. At month end, $350 of supplies remain.

The entry to record the purchase of the supplies:

DR. Supplies $1000; CR. A/P $1000

Adjustment needed: Record the usage of the supplies.

DR. Supplies Expense $650; CR. Supplies $650

1b. Prepaid Insurance: Purchased a 6-month auto insurance policy, paying $1800, on Feb 1.

The entry to record the purchase of the insurance coverage:

DR. Prepaid Insurance $1800; CR. Cash $1800

Adjustment needed: Expiration of insurance coverage at the end of the month.

$1800 6 months = $300 per month usage (expense)

DR. Insurance Expense $300; CR. Prepaid Insurance $300

NOTE: Cash is not affected in the adjusting entries!

Each adjustment affects at least one B/S account and one I/S account.

2. Accrued Revenues: If the company has provided services, then revenue should be recorded, even if the cash has not yet

been received. Example: Joe Shmoe CPA observes his client's inventory count on Dec. 31. The value of these services is $700.

Adjustment needed: DR. Accounts Receivable $700; CR. Fees Earned $700

3a. Accrued Expenses: If the company has used resources the related expense should be recorded, even if the cash payment for these items will not occur until the next period. Examples: salary expense and utilities expense. Salary Expense: The company pays all its employees a fixed salary. The weekly total for all employees is $7500. The end of the period falls on a Monday.

Adjustment needed: $7500 ÷ 5 days per week = $1500 salary per day

DR. Salary Expense $1500; CR. Salary Payable $1500

3b.Utility Expense: If the company uses electricity in December, but the December bill is not received until January- they must estimate an amount for December utility expense and record it.

Adjustment needed: The company estimates the December utility bill amount will = $200.

DR. Utility Expense$200

CR. Accounts Payable $200. (or Utility Payable)

4. Unearned Revenues: If the company RECEIVES CASH IN ADVANCE of the work or service to be performed, it results in a liability being recorded- Unearned Revenue. As the work is performed, the liability is settled and the company records revenue (Fees Earned).

Example: Pete's Photos receives $800 for engagement and wedding photography services. The cash was received in March. The engagement photos are worth $200; the wedding portrait is worth $600. The engagement photos will be taken in May, the wedding portrait will be completed in September.

The entry when the cash was received: DR. Cash $800; CR. Unearned Revenue $800

TWO Adjustments needed:

In May: DR. Unearned Revenue $200; CR. Photo Fees Earned $200 (or similar revenue acct)

In Sept: DR. Unearned Revenue $600; CR. Portrait Fees Earned $600

1.12 The Adjusted Trial Balance

Once all of the adjusting entries have been posted to the general ledger, we are ready to start working on preparing the adjusted trial balance. Preparing an adjusted trial balance is the sixth step in the accounting cycle. An adjusted trial balance is a list of all accounts in the general ledger, including adjusting entries, which have nonzero balances. This trial balance is an important step in the accounting process because it helps identify any computational errors throughout the first five steps in the cycle.

As with the unadjusted trial balance, transferring information from T-accounts to the adjusted trial balance requires consideration of the final balance in each account. If the final balance in the ledger account (T-account) is a debit balance, you will record the total in the left column of the trial balance. If the final balance in the ledger account (T-account) is a credit balance, you will record the total in the right column.

Once all ledger accounts and their balances are recorded, the debit and credit columns on the adjusted trial balance are totaled to see if the figures in each column match. The final total in the debit column must be the same dollar amount that is determined in the final credit column.

Let's now take a look at the adjusted T-accounts and adjusted trial balance for Printing Plus to see how the information is transferred from these T-accounts to the adjusted trial balance. We only focus on those general ledger accounts that had balance adjustments.

1.13 The Worksheet

Here's a short video describing how accountants use a worksheet to facilitate the creation of the adjusted trial balance, financial statements and closing entries.



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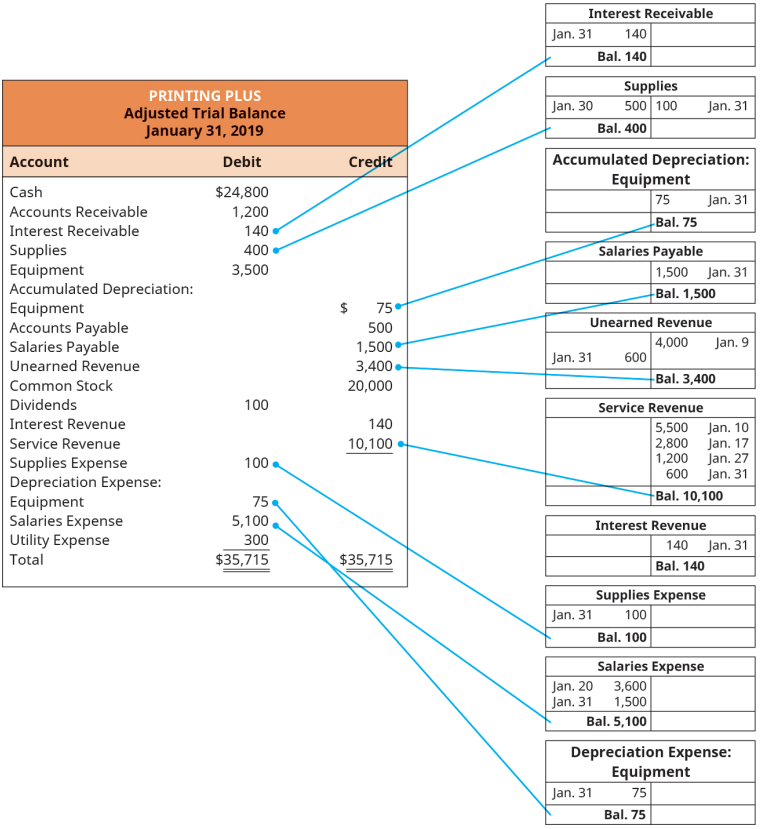
Once all of the adjusting entries have been posted to the general ledger, we are ready to start working on preparing the adjusted trial balance. Preparing an adjusted trial balance is the sixth step in the accounting cycle. An adjusted trial balance is a list of all accounts in the general ledger, including adjusting entries, which have nonzero balances. This trial balance is an important step in the accounting process because it helps identify any computational errors throughout the first five steps in the cycle.

As with the unadjusted trial balance, transferring information from T-accounts to the adjusted trial balance requires consideration of the final balance in each account. If the final balance in the ledger account (T-account) is a debit balance, you will record the total in the left column of the trial balance. If the final balance in the ledger account (T-account) is a credit balance, you will record the total in the right column.

Once all ledger accounts and their balances are recorded, the debit and credit columns on the adjusted trial balance are totaled to see if the figures in each column match. The final

total in the debit column must be the same dollar amount that is determined in the final credit column.

Let's now take a look at the adjusted T-accounts and adjusted trial balance for Printing Plus to see how the information is transferred from these T-accounts to the adjusted trial balance. We only focus on those general ledger accounts that had balance adjustments.



PRINTING PLUS
Adjusted Trial Balance
January 31, 2019

Account	Debit	Credit
Cash	$24,800	
Accounts Receivable	1,200	
Interest Receivable	140	
Supplies	400	
Equipment	3,500	
Accumulated Depreciation: Equipment		$ 75
Accounts Payable		500
Salaries Payable		1,500
Unearned Revenue		3,400
Common Stock		20,000
Dividends	100	
Interest Revenue		140
Service Revenue		10,100
Supplies Expense	100	
Depreciation Expense: Equipment	75	
Salaries Expense	5,100	
Utility Expense	300	
Total	$35,715	$35,715

Figure 1.19 Printing Plus Adjusted Trial Balance and T-accounts. *Rice University. Source: Openstax CC BY NC-SA Long Description*

For example, Interest Receivable is an adjusted account that

has a final balance of $140 on the debit side. This balance is transferred to the Interest Receivable account in the debit column on the adjusted trial balance. Supplies ($400), Supplies Expense ($100), Salaries Expense ($5,100), and Depreciation Expense–Equipment ($75) also have debit final balances in their adjusted T-accounts, so this information will be transferred to the debit column on the adjusted trial balance. Accumulated Depreciation–Equipment ($75), Salaries Payable ($1,500), Unearned Revenue ($3,400), Service Revenue ($10,100), and Interest Revenue ($140) all have credit final balances in their T-accounts. These credit balances would transfer to the credit column on the adjusted trial balance.

Once all balances are transferred to the adjusted trial balance, we sum each of the debit and credit columns. The debit and credit columns both total $35,715, which means they are equal and in balance.

PRINTING PLUS Adjusted Trial Balance January 31, 2019		
Account	**Debit**	**Credit**
Cash	$24,800	
Accounts Receivable	1,200	
Interest Receivable	140	
Supplies	400	
Equipment	3,500	
Accumulated Depreciation: Equipment		$ 75
Accounts Payable		500
Salaries Payable		1,500
Unearned Revenue		3,400
Common Stock		20,000
Dividends	100	
Interest Revenue		140
Service Revenue		10,100
Supplies Expense	100	
Depreciation Expense: Equipment	75	
Salaries Expense	5,100	
Utility Expense	300	
Total	$35,715	$35,715

Figure 1.20 Printing Plus Adjusted Trial Balance. *Rice University. Source: Openstax CC BY NC-SA Long Description*

After the adjusted trial balance is complete, we next prepare the company's financial statements.

Long Descriptions

Printing Plus Adjusted Trial Balance, January 31, 2019. Debit accounts: Cash $24,800; Accounts Receivable 1,200; Interest Receivable 140; Supplies 400; Equipment 3,500; Dividends 100; Supplies Expense 100; Depreciation Expense Equipment 75; Salaries Expense 5,100; Utility Expense 300; Total Debits $35,715. Credit accounts: Accumulated Depreciation: Equipment 75;

Accounts Payable 500; Salaries Payable 1,500; Unearned Revenue 3,400; Common Stock 20,000; Interest Revenue 140; Service Revenue 10,100; Total Credits $35,715. To the right of the adjusted trial balance are ten T-accounts, highlighting the January 31 adjusting entries, with lines connecting the balances of the T-accounts to the adjusted trial balance. The ten T-accounts, in order, are: Interest Receivable, debit balance 140. Supplies, debit balance 400. Accumulated Depreciation: Equipment, credit balance 75. Salaries Payable, credit balance 1,500. Unearned Revenue, credit balance 3,400. Service Revenue, credit balance 10,100. Interest Revenue, credit balance 140. Supplies Expense, debit balance 100. Salaries Expense, debit balance 5,100. Depreciation Expense Equipment, debit balance 75. Return

Printing Plus Adjusted Trial Balance, January 31, 2019. Debit accounts: Cash $24,800; Accounts Receivable 1,200; Interest Receivable 140; Supplies 400; Equipment 3,500; Dividends 100; Supplies Expense 100; Depreciation Expense: Equipment 75; Salaries Expense 5,100; Utility Expense 300; Total Debits $35,715. Credit accounts: Accumulated Depreciation: Equipment 75; Accounts Payable 500; Salaries Payable 1,500; Unearned Revenue 3,400; Common Stock 20,000; Interest Revenue 140; Service Revenue 10,100; Total Credits $35,715. Return

1.14 Financial Statements

One of the key factors for success for those beginning the study of accounting is to understand how the elements of the financial statements relate to each of the financial statements. That is, once the transactions are categorized into the elements, knowing what to do next is vital. This is the beginning of the process to create the financial statements. It is important to note that financial statements are discussed in the order in which the statements are presented.

Please watch the video.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=91#oembed-1

Elements of the Financial Statements

When thinking of the relationship between the elements and

the financial statements, we might think of a baking analogy: the elements represent the ingredients, and the financial statements represent the finished product. As with baking a cake, knowing the ingredients (elements) and how each ingredient relates to the final product (financial statements) is vital to the study of accounting.

To help accountants prepare and users better understand financial statements, the profession has outlined what is referred to as elements of the financial statements, which are those categories or accounts that accountants use to record transactions and prepare financial statements. There are ten elements of the financial statements, and we have already discussed most of them.

- **Revenue**—value of goods and services the organization sold or provided.
- **Expenses**—costs of providing the goods or services for which the organization earns revenue.
- **Gains**—gains are similar to revenue but relate to "incidental or peripheral" activities of the organization.
- **Losses**—losses are similar to expenses but related to "incidental or peripheral" activities of the organization.
- **Assets**—items the organization owns, controls, or has a claim to.
- **Liabilities**—amounts the organization owes to others (also called creditors).
- **Equity**—the net worth (or net assets) of the organization.
- **Investment by owners**—cash or other assets provided to the organization in exchange for an ownership interest.
- **Distribution to owners**—cash, other assets, or ownership interest (equity) provided to owners.
- **Comprehensive income**—defined as the "change in equity of a business enterprise during a period from transactions and other events and circumstances from

nonowner sources" (SFAC No. 6, p. 21). While further discussion of comprehensive income is reserved for intermediate and advanced studies in accounting, it is worth noting that comprehensive income has four components, focusing on activities related to foreign currency, derivatives, investments, and pensions.

Financial Statements for a Sample Company

In this example using a fictitious company, Cheesy Chuck's, we began with the account balances and demonstrated how to prepare the financial statements for the month of June, the first month of operations for the business. It will be helpful to revisit the process by summarizing the information we started with and how that information was used to create the four financial statements: income statement, statement of owner's equity, balance sheet, and statement of cash flows.

We started with the account balances shown in Figure 1.21.

CHEESY CHUCK'S CLASSIC CORN Account Balances For the Month Ended June 30, 2018	
Revenues	**$85,000**
Expenses:	
Popcorn	22,800
Toppings and seasonings	17,300
Employee wages and benefits	10,700
Lease payments	24,000
Utilities	3,200
Advertising	900
Miscellaneous	300
Cash	**$ 6,200**
Equipment	**$12,500**
Accounts Payable	**$ 650**
Wages Payable	**$ 1,200**
Investment by Owner	**$12,500**
Drawings by Owner	**$ (1,450)**

Figure 1.21 Account Balances for Cheesy Chuck's Classic Corn. *Obtaining the account balances is the starting point for preparing financial statements. Rice University. Source: Openstax CC BY NC-SA Long Description*

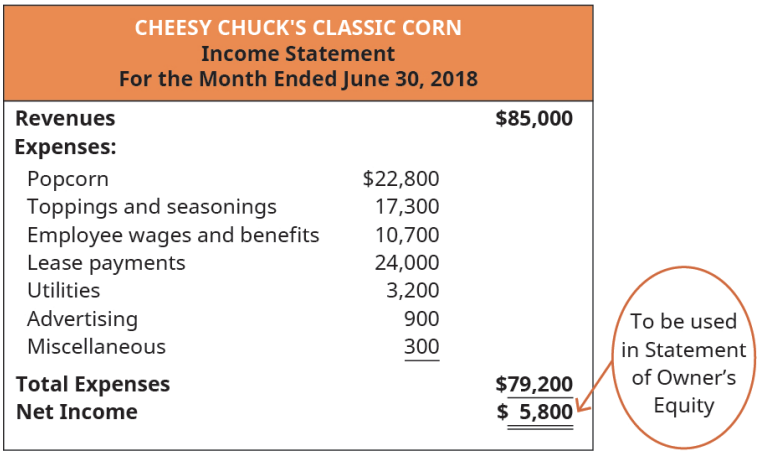
Income Statement

Let's prepare the income statement so we can inform how a service business, Cheesy Chuck's, performed for the month of June (note, an income statement is *for a period of time*). Our first step is to determine the value of goods and services that the organization sold or provided for a given period of time. These are the inflows to the business, and because the inflows relate to the primary purpose of the business (making and selling popcorn), we classify those items as Revenues, Sales, or

Fees Earned. For this example, we use Revenue. The revenue for Cheesy Chuck's for the month of June is $85,000.

Next, we need to show the total expenses for Cheesy Chuck's. Because Cheesy Chuck's tracks different types of expenses, we need to add these amounts to calculate total expenses. The final step to create the income statement is to determine the amount of net income or net loss for Cheesy Chuck's. Since revenues ($85,000) are greater than expenses ($79,200), Cheesy Chuck's has a net income of $5,800 for the month of June.

Figure 1.22 displays the June income statement for Cheesy Chuck's Classic Corn.



CHEESY CHUCK'S CLASSIC CORN Income Statement For the Month Ended June 30, 2018		
Revenues		**$85,000**
Expenses:		
Popcorn	$22,800	
Toppings and seasonings	17,300	
Employee wages and benefits	10,700	
Lease payments	24,000	
Utilities	3,200	
Advertising	900	
Miscellaneous	300	
Total Expenses		**$79,200**
Net Income		**$ 5,800**

Figure 1.22 Income Statement for Cheesy Chuck's Classic Corn*. The income statement for Cheesy Chuck's shows the business had Net Income of $5,800 for the month ended June 30. This amount will be used to prepare the next financial statement, the statement of owner's equity. Rice University. Source: Openstax CC BY NC-SA Long Description*

Financial statements are created using numerous standard conventions or practices. The standard conventions provide consistency and help assure financial statement users the information is presented in a similar manner, regardless of the

organization issuing the financial statement. Let's look at the standard conventions shown in the Cheesy Chuck's income statement:

- The heading of the income statement includes three lines.
    - The first line lists the business name.
    - The middle line indicates the financial statement that is being presented.
    - The last line indicates the time frame of the financial statement. Do not forget the income statement is *for a period of time* (the month of June in our example).
- There are three columns.
    - Going from left to right, the first column is the category heading or account.
    - The second column is used when there are numerous accounts in a particular category (Expenses, in our example).
    - The third column is a total column. In this illustration, it is the column where subtotals are listed and net income is determined (subtracting Expenses from Revenues).
- Subtotals are indicated by a single underline, while totals are indicated by a double underline. Notice the amount of Miscellaneous Expense ($300) is formatted with a single underline to indicate that a subtotal will follow. Similarly, the amount of "Net Income" ($5,800) is formatted with a double underline to indicate that it is the final value/total of the financial statement.
- There are no gains or losses for Cheesy Chuck's. Gains and losses are not unusual transactions for businesses, but gains and losses may be infrequent for some, especially small, businesses.

Statement of Owner's Equity (Retained Earnings)

Let's create the statement of owner's equity for Cheesy Chuck's for the month of June. Since Cheesy Chuck's is a brand-new business, there is no beginning balance of Owner's Equity. The first items to account for are the increases in value/equity, which are investments by owners and net income. As you look at the accounting information you were provided, you recognize the amount invested by the owner, Chuck, was $12,500. Next, we account for the increase in value as a result of net income, which was determined in the income statement to be $5,800. Next, we determine if there were any activities that decreased the value of the business. More specifically, we are accounting for the value of distributions to the owners and net loss, if any.

It is important to note that an organization will have either net income or net loss for the period, but not both. Also, small businesses in particular may have periods where there are no investments by, or distributions to, the owner(s). For the month of June, Chuck withdrew $1,450 from the business. This is a good time to recall the terminology used by accountants based on the legal structure of the particular business. Since the account was titled "Drawings by Owner" and because Chuck is the only owner, we can assume this is a sole proprietorship. If the business was structured as a corporation, this activity would be called something like "Dividends Paid to Owners."

At this stage, remember that since we are working with a sole proprietorship to help simplify the examples, we have addressed the owner's value in the firm as *capital* or *owner's equity*. However, later we switch the structure of the business to a corporation, and instead of owner's equity, we begin using such account titles as *common stock* and *retained earnings* to represent the owner's interests. The corporate treatment is

more complicated, because corporations may have a few owners up to potentially thousands of owners (stockholders). The details of accounting for the interests of corporations are covered in a subsequent chapter.

So how much did the value of Cheesy Chuck's change during the month of June? You are correct if you answered $16,850. Since this is a brand-new store, the beginning value of the business is zero. During the month, the owner invested $12,500 and the business had profitable operations (net income) of $5,800. Also, during the month the owner withdrew $1,450, resulting in a net change (and ending balance) to owner's equity of $16,850. Shown in a formula:

Beginning Balance + Investments by Owners ± Net Income (Net Loss) – Distributions, or

$$\$0 + \$12,500 + \$5,800 - \$1,450 = \$16,850$$

Figure 1.23 shows what the statement of owner's equity for Cheesy Chuck's Classic Corn would look like.

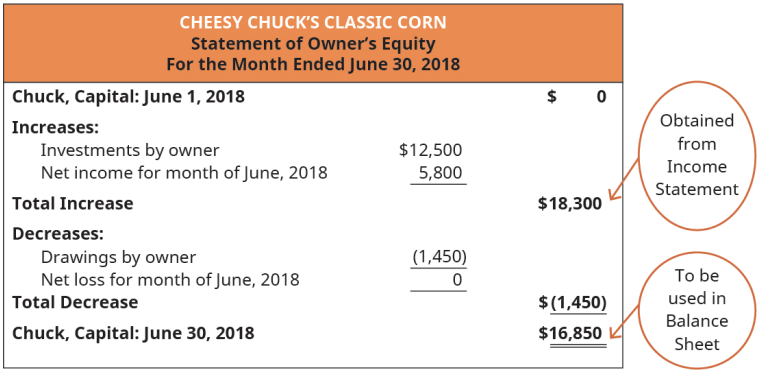


Figure 1.23 Statement of Owner's Equity for Cheesy Chuck's Classic Corn. *The statement of owner's equity demonstrates how the net worth (also called equity) of the business changed over the period of time (the month of June in this case). Notice the amount of net income (or net loss) is brought from the income statement. In a similar manner, the ending equity balance (Capital for Cheesy Chuck's because it is a sole proprietorship) is carried forward to the balance sheet. Rice University. Source: Openstax CC BY NC-SA Long Description*

Notice the following about the statement of owner's equity for Cheesy Chuck's:

- The format is similar to the format of the income statement (three lines for the heading, three columns).
- The statement follows a chronological order, starting with the first day of the month, accounting for the changes that occurred throughout the month, and ending with the final day of the month.

The statement uses the final number from the financial statement previously completed. In this case, the statement of owner's equity uses the net income (or net loss) amount from the income statement (Net Income, $5,800).

Balance Sheet

Let's create a balance sheet for Cheesy Chuck's for June 30. To begin, we look at the accounting records and determine what assets the business owns and the value of each. Cheesy Chuck's has two assets: Cash ($6,200) and Equipment ($12,500). Adding the amount of assets gives a total asset value of $18,700. As discussed previously, the equipment that was recently purchased will be depreciated in the future, beginning with the next accounting period.

Next, we determine the amount of money that Cheesy Chuck's owes (liabilities). There are also two liabilities for Cheesy Chuck's. The first account listed in the records is Accounts Payable for $650. Accounts Payable is the amount that Cheesy Chuck's must pay *in the future* to vendors (also called suppliers) for the ingredients to make the gourmet popcorn. The other liability is Wages Payable for $1,200. This is the amount that Cheesy Chuck's must pay in the future to employees for work that has been performed. Adding the two amounts gives us total liabilities of $1,850. (Here's a hint as you develop your understanding of accounting: Liabilities often include the word "payable." So, when you see "payable" in the account title, know these are amounts owed in the future—liabilities.)

Finally, we determine the amount of equity the owner, Cheesy Chuck, has in the business. The amount of owner's equity was determined on the statement of owner's equity in the previous step ($16,850). Can you think of another way to confirm the amount of owner's equity? Recall that equity is also called net assets (assets minus liabilities). If you take the total assets of Cheesy Chuck's of $18,700 and subtract the total liabilities of $1,850, you get owner's equity of $16,850. Using the basic accounting equation, the balance sheet for Cheesy Chuck's as of June 30 is shown in Figure 1.24.

CHEESY CHUCK'S CLASSIC CORN Balance Sheet As of June 30, 2018			
Assets		**Liabilities**	
Cash	$ 6,200	Accounts Payable	$ 650
Equipment	12,500	Wages Payable	1,200
		Total Liabilities	**$ 1,850**
		Owner's Equity	
		Cheesy Chuck, Capital	16,850
		Total Owner's Equity	**$16,850**
Total Assets	**$18,700**	**Total Liabilities and Owner's Equity**	**$18,700**

Figure 1.24 Balance Sheet for Cheesy Chuck's Classic Corn. *The balance sheet shows what the business owns (Assets), owes (Liabilities), and is worth (equity) on a given date. Notice the amount of Owner's Equity (Capital for Cheesy Chuck's) was brought forward from the statement of owner's equity. Rice University. Source: Openstax CC BY NC-SA Long Description*

Connecting the Income Statement and the Balance Sheet

Another way to think of the connection between the income statement and balance sheet (which is aided by the statement of owner's equity) is by using a sports analogy. The income statement summarizes the financial *performance* of the business for a given period of time. The income statement reports how the business performed financially each month—the firm earned either net income or net loss. This is similar to the outcome of a particular game—the team either won or lost.

The balance sheet summarizes the financial *position* of the business on a given date. Meaning, because of the financial *performance* over the past twelve months, for example, this is the financial *position* of the business as of December 31. Think of the balance sheet as being similar to a team's overall win/loss record—to a certain extent a team's strength can be perceived by its win/loss record.

However, because different companies have different sizes, you do not necessarily want to compare the balance sheets of two different companies. For example, you would not want to compare a local retail store with Walmart. In most cases you want to compare a company with its past balance sheet information.

Statement of Cash Flows

This fourth and final financial statement lists the cash inflows and cash outflows for the business *for a period of time*. It was created to fill in some informational gaps that existed in the other three statements (income statement, owner's equity/ retained earnings statement, and the balance sheet).

Please watch the video and answer the question(s)!



An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://psu.pb.unizin.org/acctg211/?p=91#h5p-3

Long Descriptions

Cheesy Chuck's Classic Corn, Account Balances, For the Month Ended June 30, 2018. Revenues $85,000; Expenses: Popcorn 22,800, toppings and seasonings 17,300, Employee wages and benefits 10,700, Lease payments 24,000, Utilities 3,200, Advertising 900, Miscellaneous 300; Cash 6,200; Equipment 12,500; Accounts Payable 650; Wages Payable 1,200; Investment by Owner 12,500; Drawings by owner minus 1,450. Return

Cheesy Chuck's Classic Corn, Income Statement, For the Month Ended June 30, 2018. Revenues $85,000, less Expenses: Popcorn 22,800, Toppings and seasonings 17,300, Employee wages and benefits 10,700, Lease payments 24,000, Utilities 3,200, Advertising 900, Miscellaneous 300 for Total Expenses 79,200 equaling Net Income $5,800. This Net Income figure will be used in the Statement of Owner's Equity. Return

Cheesy Chuck's Classic Corn, Statement of Owner's Equity, For the month Ended June 30, 2018. Chuck, Capital: June 1, 2018 $0; Increases: Investments by owner $12,500, Net income for the month of june, 2018 [obtained from the income statement] 5,800. Total Increase 18,300. Decreases: Drawings by owner (1,450). Total Decrease (1,450); Chuck, Capital: June 30, 2018 $16,850 [To be used in Balance Sheet] Return

Cheesy Chuck's Classic Corn, Balance Sheet, As of June 30, 2018. Assets: Cash 6,200, Equipment 12,500. Total Assets 18,700. Liabilities: Accounts Payable 650, Wages Payable 1,200. Total Liabilties 1,850; Owner's Equity: Cheesy Chuck, Capital 16,800. Total Owner's Equity 16,850; Total Liabilities and Owner's Equity 18,700. Return

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1.15 Closing Entries

In this segment, we complete the final steps (steps 8 and 9) of the accounting cycle, the closing process. You will notice that we do not cover step 10, reversing entries. This is an optional step in the accounting cycle that you will learn about in future courses.

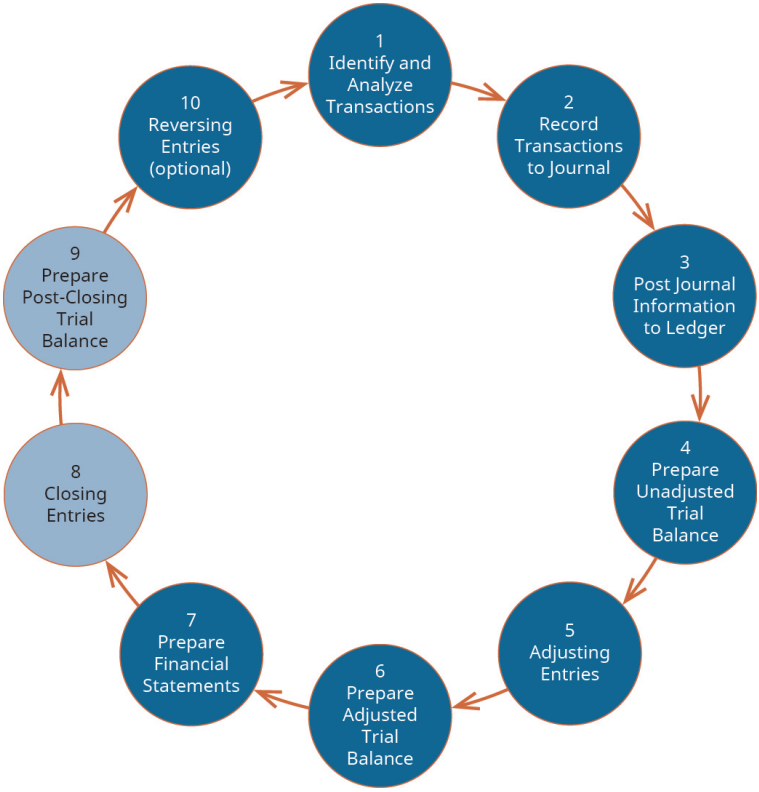


Figure 1.25 Closing entries *© Rice University OpenStax CC BY-NC-SA (Attribution NonCommercial ShareAlike) license Long Description*

Our discussion here begins with journalizing and posting the closing entries (Figure 1.26). These posted entries will then translate into a post-closing trial balance, which is a trial balance that is prepared after all of the closing entries have been recorded.

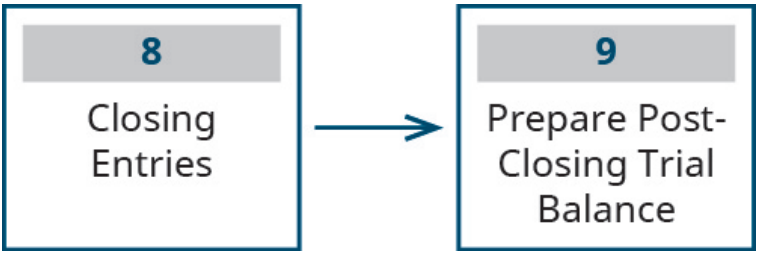


Figure 1.26 Final steps in the accounting cycle. *© Rice University* *OpenStax CC BY-NC-SA (Attribution NonCommercial ShareAlike)*

Introduction to the Closing Entries

Companies are required to close their books at the end of each fiscal year so that they can prepare their annual financial statements and tax returns. However, most companies prepare monthly financial statements and close their books annually, so they have a clear picture of company performance during the year, and give users timely information to make decisions.

Closing entries prepare a company for the next accounting period by clearing any outstanding balances in certain accounts that should not transfer over to the next period. Closing, or clearing the balances, means returning the account to a zero balance. Having a zero balance in these accounts is important so a company can compare performance across periods, particularly with income. It also helps the company keep thorough records of account balances affecting retained earnings. Revenue, expense, and dividend accounts affect retained earnings and are closed so they can

accumulate new balances in the next period, which is an application of the time period assumption.

To further clarify this concept, balances are closed to assure all revenues and expenses are recorded in the proper period and then start over the following period. The revenue and expense accounts should start at zero each period, because we are measuring how much revenue is earned and expenses incurred during the period. However, the cash balances, as well as the other balance sheet accounts, are carried over from the end of a current period to the beginning of the next period.

For example, a store has an inventory account balance of $100,000. If the store closed at 11:59 p.m. on January 31, 2019, then the inventory balance when it reopened at 12:01 a.m. on February 1, 2019, would still be $100,000. The balance sheet accounts, such as inventory, would carry over into the next period, in this case February 2019.

The accounts that need to start with a clean or $0 balance going into the next accounting period are revenue, income, and any dividends from January 2019. To determine the income (profit or loss) from the month of January, the store needs to close the income statement information from January 2019. Zeroing January 2019 would then enable the store to calculate the income (profit or loss) for the next month (February 2019), instead of merging it into January's income and thus providing invalid information solely for the month of February.

However, if the company also wanted to keep year-to-date information from month to month, a separate set of records could be kept as the company progresses through the remaining months in the year. For our purposes, assume that we are closing the books at the end of each month unless otherwise noted.

Let's look at another example to illustrate the point. Assume you own a small landscaping business. It is the end of the year, December 31, 2018, and you are reviewing your financials for the entire year. You see that you earned $120,000 this year in

revenue and had expenses for rent, electricity, cable, internet, gas, and food that totaled $70,000.

You also review the following information:

	Value December 31
Bank account balance	$ 7,500
Electronics	3,250
Car	26,545
Furniture	7,200
Credit card balances	9,270
Bank loans	48,350

The next day, January 1, 2019, you get ready for work, but before you go to the office, you decide to review your financials for 2019. What are your year-to-date earnings? So far, you have not worked at all in the current year. What are your total expenses for rent, electricity, cable and internet, gas, and food for the current year? You have also not incurred any expenses yet for rent, electricity, cable, internet, gas or food. This means that the current balance of these accounts is zero, because they were closed on December 31, 2018, to complete the annual accounting period.

Next, you review your assets and liabilities. What is your current bank account balance? What is the current book value of your electronics, car, and furniture? What about your credit card balances and bank loans? Are the value of your assets and liabilities now zero because of the start of a new year? Your car, electronics, and furniture did not suddenly lose all their value, and unfortunately, you still have outstanding debt. Therefore, these accounts still have a balance in the new year, because they are not closed, and the balances are carried forward from December 31 to January 1 to start the new annual accounting period.

This is no different from what will happen to a company at the end of an accounting period. A company will see its revenue and expense accounts set back to zero, but its assets

and liabilities will maintain a balance. Stockholders' equity accounts will also maintain their balances. In summary, the accountant resets the temporary accounts to zero by transferring the balances to permanent accounts.

Temporary and Permanent Accounts

All accounts can be classified as either permanent (real) or temporary (nominal) the following Figure 1.27.

Permanent (real) accounts are accounts that transfer balances to the next period and include balance sheet accounts, such as assets, liabilities, and stockholders' equity. These accounts will not be set back to zero at the beginning of the next period; they will keep their balances. Permanent accounts are not part of the closing process.

Temporary (nominal) accounts are accounts that are closed at the end of each accounting period, and include income statement, dividends, and income summary accounts. The new account, Income Summary, will be discussed shortly. These accounts are temporary because they keep their balances during the current accounting period and are set back to zero when the period ends. Revenue and expense accounts are closed to Income Summary, and Income Summary and Dividends are closed to the permanent account, Retained Earnings.

	Financial Statement Presented On			Account	
Type of Account	Income Statement	Statement of Retained Earnings	Balance Sheet	Temporary	Permanent
Asset			X		X
Contra Asset			X		X
Liability			X		X
Stockholders' Equity			X		X
Dividends*		X		X	
Revenues	X			X	
Expenses	X			X	

*Contra Stockholders' Equity

Figure 1.27 Location Chart for Financial Statement Accounts. *© Rice University OpenStax CC BY-NC-SA (Attribution NonCommercial ShareAlike) Long Description*

The income summary account is an intermediary between revenues and expenses, and the Retained Earnings account. It stores all of the closing information for revenues and expenses, resulting in a "summary" of income or loss for the period. The balance in the Income Summary account equals the net income or loss for the period. This balance is then transferred to the Retained Earnings account.

Income summary is a nondefined account category. This means that it is not an asset, liability, stockholders' equity, revenue, or expense account. The account has a zero balance throughout the entire accounting period until the closing entries are prepared. Therefore, it will not appear on any trial balances, including the adjusted trial balance, and will not appear on any of the financial statements.

You might be asking yourself, "is the Income Summary account even necessary?" Could we just close out revenues and expenses directly into retained earnings and not have this extra temporary account? We could do this, but by having the Income Summary account, you get a balance for net income a second time. This gives you the balance to compare to the income statement, and allows you to double check that all income statement accounts are closed and have correct

amounts. If you put the revenues and expenses directly into retained earnings, you will not see that check figure. No matter which way you choose to close, the same final balance is in retained earnings.



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https://psu.pb.unizin.org/acctg211/?p=140#h5p-6

Journalizing and Posting Closing Entries

The eighth step in the accounting cycle is preparing closing entries, which includes journalizing and posting the entries to the ledger.

Four entries occur during the closing process. The first entry closes revenue accounts to the Income Summary account. The second entry closes expense accounts to the Income Summary account. The third entry closes the Income Summary account to Retained Earnings. The fourth entry closes the Dividends account to Retained Earnings. The information needed to prepare closing entries comes from the adjusted trial balance.

Let's explore each entry in more detail using Printing Plus's information from Analyzing and Recording Transactions and The Adjustment Process as our example. The Printing Plus adjusted trial balance for January 31, 2019, is presented in the following Figure 1.28.

PRINTING PLUS Adjusted Trial Balance For the Month Ended January 31, 2019		
Account Title	**Debit**	**Credit**
Cash	$24,800	
Accounts Receivable	1,200	
Interest Receivable	140	
Supplies	400	
Equipment	3,500	
Accumulated Depreciation: Equipment		$ 75
Accounts Payable		500
Salaries Payable		1,500
Unearned Revenue		3,400
Common Stock		20,000
Dividends	100	
Interest Revenue		140
Service Revenue		10,100
Supplies Expense	100	
Depreciation Expense: Equipment	75	
Salaries Expense	5,100	
Utility Expense	300	
Total	$35,715	$35,715

Figure 1.28 Adjusted Trial Balance for Printing Plus. *© Rice University OpenStax CC BY-NC-SA (Attribution NonCommercial ShareAlike) Long Description*

The first entry requires revenue accounts close to the Income Summary account. To get a zero balance in a revenue account, the entry will show a debit to revenues and a credit to Income Summary. Printing Plus has $140 of interest revenue and $10,100 of service revenue, each with a credit balance on the adjusted trial balance. The closing entry will debit both interest revenue and service revenue, and credit Income Summary.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Interest Revenue Service Revenue Income Summary *To close revenue accounts to Income Summary*	140 10,100	 10,240

The T-accounts after this closing entry would look like the following.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Interest Revenue	140	
	Service Revenue	10,100	
	Income Summary		10,240
	To close revenue accounts to Income Summary		

Long Description</p

Notice that the balances in interest revenue and service revenue are now zero and are ready to accumulate revenues in the next period. The Income Summary account has a credit balance of $10,240 (the revenue sum).

The second entry requires expense accounts close to the Income Summary account. To get a zero balance in an expense account, the entry will show a credit to expenses and a debit to Income Summary. Printing Plus has $100 of supplies expense, $75 of depreciation expense–equipment, $5,100 of salaries expense, and $300 of utility expense, each with a debit balance on the adjusted trial balance. The closing entry will credit Supplies Expense, Depreciation Expense–Equipment, Salaries Expense, and Utility Expense, and debit Income Summary.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Income Summary	5,575	
	Supplies Expense		100
	Depreciation Expense: Equipment		75
	Salaries Expense		5,100
	Utility Expense		300
	To close expense accounts to Income Summary		

The T-accounts after this closing entry would look like the following.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Income Summary	5,575	
	Supplies Expense		100
	Depreciation Expense: Equipment		75
	Salaries Expense		5,100
	Utility Expense		300
	To close expense accounts to Income Summary		

Long Description

Notice that the balances in the expense accounts are now zero and are ready to accumulate expenses in the next period.

The Income Summary account has a new credit balance of $4,665, which is the difference between revenues and expenses in Figure 1.29. The balance in Income Summary is the same figure as what is reported on Printing Plus's Income Statement.

PRINTING PLUS Income Statement For the Month Ended January 31, 2019		
Revenues		
Interest Revenue	$ 140	
Service Revenue	10,100	
Total Revenues		$10,240
Expenses		
Supplies Expense	100	
Depreciation Expense: Equipment	75	
Salaries Expense	5,100	
Utility Expense	300	
Total Expenses		5,575
Net Income		$ 4,665

Figure 1.29 Income Statement for Printing Plus. *© Rice University* *OpenStax CC BY-NC-SA (Attribution NonCommercial ShareAlike)*

Why are these two figures the same? The income statement summarizes your income, as does income summary. If both summarize your income in the same period, then they must be equal. If they do not match, then you have an error.

The third entry requires Income Summary to close to the Retained Earnings account. To get a zero balance in the Income Summary account, there are guidelines to consider.

- If the balance in Income Summary before closing is a credit balance, you will debit Income Summary and credit Retained Earnings in the closing entry. This situation occurs when a company has a net income.
- If the balance in Income Summary before closing is a debit balance, you will credit Income Summary and debit

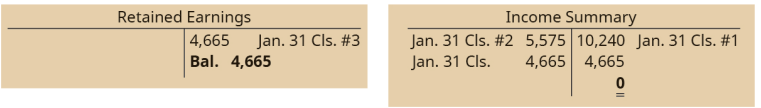
Retained Earnings in the closing entry. This situation occurs when a company has a net loss.

Remember that net income will increase retained earnings, and a net loss will decrease retained earnings. The Retained Earnings account increases on the credit side and decreases on the debit side.

Printing Plus has a $4,665 credit balance in its Income Summary account before closing, so it will debit Income Summary and credit Retained Earnings.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Income Summary	4,665	
	Retained Earnings		4,665
	To close Income Summary to Retained Earnings		

The T-accounts after this closing entry would look like the following.



Long Description

Notice that the Income Summary account is now zero and is ready for use in the next period. The Retained Earnings account balance is currently a credit of $4,665.

The fourth entry requires Dividends to close to the Retained Earnings account. Remember from your past studies that dividends are not expenses, such as salaries paid to your employees or staff. Instead, declaring and paying dividends is a method utilized by corporations to return part of the profits generated by the company to the owners of the company—in this case, its shareholders.

If dividends were not declared, closing entries would cease at this point. If dividends are declared, to get a zero balance in the Dividends account, the entry will show a credit to Dividends and a debit to Retained Earnings. As you will learn in Corporation Accounting, there are three components to the declaration and payment of dividends. The first part is the date

of declaration, which creates the obligation or liability to pay the dividend. The second part is the date of record that determines who receives the dividends, and the third part is the date of payment, which is the date that payments are made. Printing Plus has $100 of dividends with a debit balance on the adjusted trial balance. The closing entry will credit Dividends and debit Retained Earnings.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 31, 2019	Retained Earnings	100	
	Dividends		100
	To close dividends account to Retained Earnings		

The T-accounts after this closing entry would look like the following.

Retained Earnings					
Jan. 31	Cls. #4	100	4,665	Jan. 31	Cls. #3
			Bal.	**4,565**	

Dividends					
Jan. 14		100			
		100	100	Jan. 31	Cls.
		0			

Why was income summary not used in the dividends closing entry? Dividends are not an income statement account. Only income statement accounts help us summarize income, so only income statement accounts should go into income summary.

Remember, dividends are a contra stockholders' equity account. It is contra to retained earnings. If we pay out dividends, it means retained earnings decreases. Retained earnings decreases on the debit side. The remaining balance in Retained Earnings is $4,565 the following Figure 5.6. This is the same figure found on the statement of retained earnings.

PRINTING PLUS Statement of Retained Earnings For the Month Ended January 31, 2019	
Beginning Retained Earnings (Jan. 1)	$ 0
Net Income	4,665
Dividends	(100)
Ending Retained Earnings (Jan. 31)	$4,565

Figure 1.30 Statement of Retained Earnings for Printing Plus. *© Rice University OpenStax CC BY-NC-SA (Attribution NonCommercial ShareAlike)*

The statement of retained earnings shows the period-ending retained earnings after the closing entries have been posted. When you compare the retained earnings ledger (T-account) to the statement of retained earnings, the figures must match. It is important to understand retained earnings is *not* closed out, it is only updated. Retained Earnings is the only account that appears in the closing entries that does not close. You should recall from your previous material that retained earnings are the earnings retained by the company over time—not cash flow but earnings. Now that we have closed the temporary accounts, let's review what the post-closing ledger (T-accounts) looks like for Printing Plus.

T-Account Summary

The T-account summary for Printing Plus after closing entries are journalized is presented in Figure 1.31.

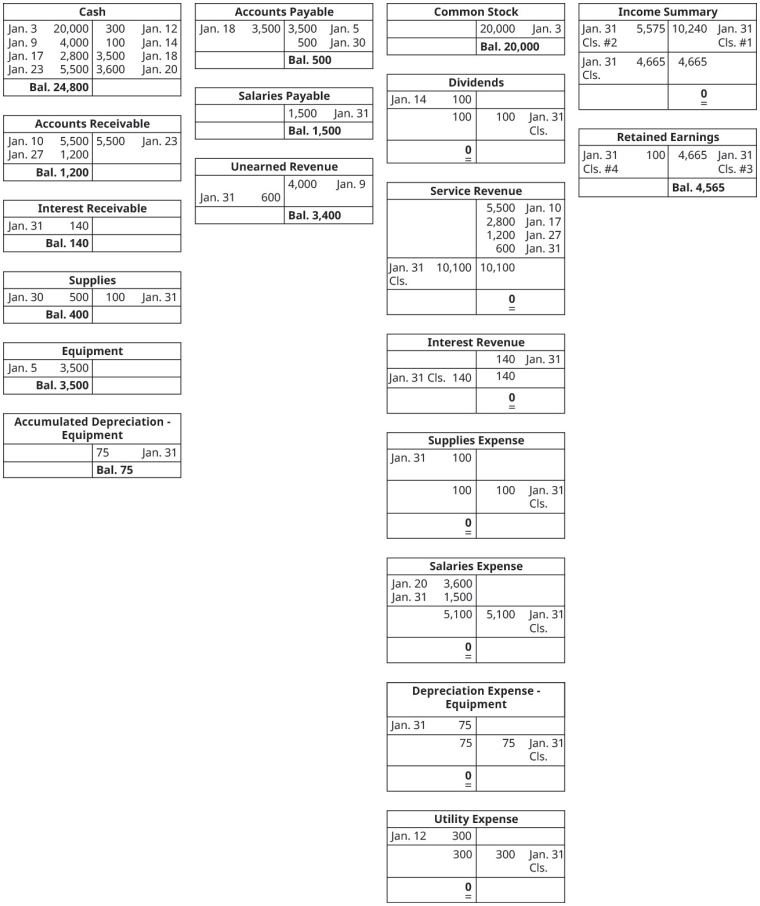


Figure 1.31 T-Account Summary. *© Rice University OpenStax CC BY-NC-SA (Attribution NonCommercial ShareAlike) Long Description*

Notice that revenues, expenses, dividends, and income summary all have zero balances. Retained earnings maintains a $4,565 credit balance. The post-closing T-accounts will be transferred to the post-closing trial balance, which is step 9 in the accounting cycle.

Here's a short video summarizing the four closing entries.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=140#oembed-1

Long Description

A large circle labeled, in the center, The Accounting Cycle. The large circle consists of 10 smaller circles with arrows pointing from one smaller circle to the next one. The smaller circles are labeled, in clockwise order: 1 Identify and Analyze Transactions; 2 Record Transactions to Journal; 3 Post Journal Information to Ledger; 4 Prepare Unadjusted Trial Balance; 5 Adjusting Entries; 6 Prepare Adjusted Trial Balance; 7 Prepare Financial Statements; 8 Closing Entries; 9 Prepare Post-Closing Trial Balance; 10 Reversing Entries (optional). The circles for 8 Closing Entries and 9 Prepare Post-Closing Trial Balance are shaded a slightly different color. Return

Financial Statement Presented On, Account, for the following accounts: Asset: Balance Sheet, Permanent; Contra Asset: Balance Sheet, Permanent; Liability: Balance Sheet, Permanent; Stockholders' Equity: Balance Sheet, Permanent; Dividends*: Statement of Retained Earnings, Temporary; Revenues: Income Statement, Temporary; Expenses: Income Statement, Temporary. *Contra Stockholders' Equity. Return

Printing Plus, Adjusted Trial Balance, January 31, 2019. Account Title, Debit or Credit. Cash $24,800 debit. Accounts Receivable 1,200 debit. Interest Receivable 140 debit. Supplies 400 debit. Equipment 3,500 debit. Accumulated Depreciation: Equipment $75 credit. Accounts Payable 500 credit. Salaries

Payable 1,500 credit. Unearned Revenue 3,400 credit. Common Stock 20,000 credit. Dividends 100 debit. Interest Revenue 140 credit. Service Revenue 10,100 credit. Supplies Expense 100 debit. Depreciation Expense: Equipment 75 debit. Salaries Expense 5,100 debit. Utility Expense 300 debit. Totals: $35,715 debits, $35,715 credits." Return

Service Revenue T-account has 4 entries on the credit side: January 10 5,500, January 17 2,800, January 27 1,200, January 31 600. The total on the credit side is then 10,100. There is a January 31 closing entry to the debit side of 10,100, leaving a 0 balance on the credit side. The Interest Revenue T-account has one credit entry on January 31 of 140, a credit balance of 140, a debit side closing entry on January 31 of 140, and a 0 balance on the credit side. The Income Summary T-Account has a debit of 10,240 on January 31 for Closing entry #1, leaving a credit side balance of 10,240. Return

Supplies Expense T-account has a January 31 debit side entry of 100, a debit balance of 100, a credit closing entry of 100, leaving a 0 debit side balance. Depreciation Expense: Equipment T-account has a January 31 debit side entry of 75, a debit balance of 75, a credit closing entry of 75, leaving a 0 debit side balance. Salaries Expense T-account has a January 20 debit side entry of 3,600, January 31 debit side entry of 1,500, a debit balance of 5,100, a credit closing entry of 5,100, leaving a 0 debit side balance. Utilities Expense T-account has a January 31 debit side entry of 300, a debit balance of 300, a credit closing entry of 300, leaving a 0 debit side balance. Income Summary T-account has a January 31 debit side closing entry #2 of 5,575, a January 31 credit side closing entry #1 of 10,240, leaving a credit balance of 4,665. Return

Retained Earnings T-account has credit closing entry #3 on January 31 of 4,665, leaving a balance on the credit side of 4,665. Income Summary T-account has a January 31 debit side closing entry #2 of 5,575, a January 31 credit side closing entry #1 of 10,240, leaving a credit balance of 4,665. It then has a January 31

closing entry on the credit side of 4,665, leaving a 0 balance on the credit side. Return

Cash has a January 3 debit entry of 20,000, a January 9 debit entry of 4,000, a January 12 credit entry of 300, a January 14 credit entry of 100, a January 17 debit entry of 2,800, a January 18 credit entry of 3,500, a January 20 credit entry of 3,600, a January 23 debit entry of 5,500, leaving a debit balance of 24,800. Accounts Receivable has a January 10 debit entry of 5,500, a January 23 credit entry of 5,500, a January 27 debit entry of 1,200 and a debit balance of 1,200. Interest Receivable has a January 31 debit entry of 140 and a debit balance of 140. Supplies has a January 30 debit entry of 500, a January 31 credit entry of 100 and a debit balance of 400. Equipment has a January 5 debit entry of 3,500 and a debit balance of 3,500. Accumulated Depreciation: Equipment has a January 31 credit entry of 75 and a credit balance of 75. Accounts Payable has a January 5 credit entry of 3,500, a January 13 debit entry of 3,500, a January 30 credit entry of 500, and a credit balance of 500. Salaries Payable has a January 31 credit entry of 1,500 and a credit balance of 1,500. Unearned Revenue has a January 9 credit entry of 4,000, a January 31 debit entry of 600, leaving a credit balance of 3,400. Common Stock has a January 3 credit entry of 20,000 and a credit balance of 20,000. Dividends has a January 14 debit entry of 100, a debit balance of 100, a credit January 31 closing entry for 100, leaving a debit side 0 balance. Service Revenue account has 4 entries on the credit side: January 10 5,500, January 17 2,800, January 27 1,200, January 31 600. The total on the credit side is then 10,100. There is a January 31 closing entry to the debit side of 10,100, leaving a 0 balance on the credit side. The Interest Revenue has one credit entry on January 31 of 140, a credit balance of 140, a debit side closing entry on January 31 of 140, and a 0 balance on the credit side. Supplies Expense has a January 31 debit side entry for 100, a debit side balance of 100, a credit side January 31 closing entry for 100, leaving a 0 debit side balance. Salaries Expense has

a January 20 debit side entry for 3,600, a debit side entry on January 31 for 1,500, a debit side balance of 5,100, a credit side January 31 closing entry of 5,100, leaving a 0 debit side balance. Depreciation Expense: Equipment has a January 31 debit side entry for 75, a debit side balance of 375, a credit side January 31 closing entry of 75, leaving a 0 debit side balance. Utilities Expense has a January 12 debit side entry for 300, a debit side balance of 300, a credit side January 31 closing entry of 300, leaving a 0 debit side balance. Income Summary has a January 31 debit side closing entry #2 of 5,575, a January 31 credit side closing entry #1 of 10,240, leaving a credit balance of 4,665. It then has a January 31 closing entry on the credit side of 4,665, leaving a 0 balance on the credit side. Retained Earnings has a debit closing entry #4 on January 31 for 100, a credit closing entry #3 for 4,665, and a credit balance of 4,565. Return

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1.16 Post-Closing Trial Balance

The ninth, and typically final, step of the process is to prepare a post-closing trial balance. The word "post" in this instance means "after." You are preparing a trial balance *after* the closing entries are complete.

Like all trial balances, the post-closing trial balance has the job of verifying that the debit and credit totals are equal. The post-closing trial balance has one additional job that the other trial balances do not have. The post-closing trial balance is also used to double-check that the only accounts with balances after the closing entries are permanent accounts. If there are any temporary accounts on this trial balance, you would know that there was an error in the closing process. This error must be fixed before starting the new period.

The process of preparing the post-closing trial balance is the same as you have done when preparing the unadjusted trial balance and adjusted trial balance. Only permanent account balances should appear on the post-closing trial balance. These balances in post-closing T-accounts are transferred over to either the debit or credit column on the post-closing trial balance. When all accounts have been recorded, total each column and verify the columns equal each other.

The post-closing trial balance for Printing Plus is shown in Figure 1.32.

PRINTING PLUS Post-Closing Trial Balance January 31, 2019		
Account	**Debit**	**Credit**
Cash	$24,800	
Accounts Receivable	1,200	
Interest Receivable	140	
Supplies	400	
Equipment	3,500	
Accumulated Depreciation: Equipment		$ 75
Accounts Payable		500
Salaries Payable		1,500
Unearned Revenue		3,400
Common Stock		20,000
Retained Earnings		4,565
Total	$30,040	$30,040

Figure 1.32 Printing Plus's Post-Closing Trial Balance. *Rice University. Source: Openstax CC BY NC-SA Long Description*

Notice that only permanent accounts are included. All temporary accounts with zero balances were left out of this statement. Unlike previous trial balances, the retained earnings figure is included, which was obtained through the closing process.

At this point, the accounting cycle is complete, and the company can begin a new cycle in the next period. In essence, the company's business is always in operation, while the accounting cycle utilizes the cutoff of month-end to provide financial information to assist and review the operations.

It is worth mentioning that there is one step in the process that a company may or may not include, step 10, reversing entries. Reversing entries reverse an adjusting entry made in a prior period at the start of a new period. We do not cover reversing entries in this chapter, but you might approach the subject in future accounting courses.

Now that we have completed the accounting cycle, let's take

a look at another way the adjusted trial balance assists users of information with financial decision-making.

CONCEPTS IN PRACTICE

The Importance of Understanding How to Complete the Accounting Cycle

Many students who enroll in an introductory accounting course do not plan to become accountants. They will work in a variety of jobs in the business field, including managers, sales, and finance. In a real company, most of the mundane work is done by computers. Accounting software can perform such tasks as posting the journal entries recorded, preparing trial balances, and preparing financial statements. Students often ask why they need to do all of these steps by hand in their introductory class, particularly if they are never going to be an accountant. It is very important to understand that no matter what your position, if you work in business you need to be able to read financial statements, interpret them, and know how to use that information to better your business. If you have never followed the full process from beginning to end, you will never understand how one of your decisions can impact the final numbers that appear on your financial statements. You will not understand how your decisions can affect the outcome of your company.

As mentioned previously, once you understand the effect your decisions will have on the bottom line on your income statement and the balances in your balance sheet, you can use accounting software to do all of the mundane, repetitive steps and use your time to evaluate the company based on what the

financial statements show. Your stockholders, creditors, and other outside professionals will use your financial statements to evaluate your performance. If you evaluate your numbers as often as monthly, you will be able to identify your strengths and weaknesses before any outsiders see them and make any necessary changes to your plan in the following month.

Long Description

Printing Plus, Post-Closing Trial Balance, January 31, 2019. Account Title, Debit or Credit. Cash $24,800 debit. Accounts Receivable 1,200 debit. Interest Receivable 140 debit. Supplies 400 debit. Equipment 3,500 debit. Accumulated Depreciation: Equipment $75 credit. Accounts Payable 500 credit. Salaries Payable 1,500 credit. Unearned Revenue 3,400 credit. Common Stock 20,000 credit. Retained Earnings 4,565 credit. Total 30,040 debit, 30,040 credit. Return

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1.17 Accounting Cycle Comprehensive Example

We have gone through the entire accounting cycle for Printing Plus with the steps spread over three chapters. Let's go through the complete accounting cycle for another company here. The full accounting cycle diagram is presented in Figure 1.33.

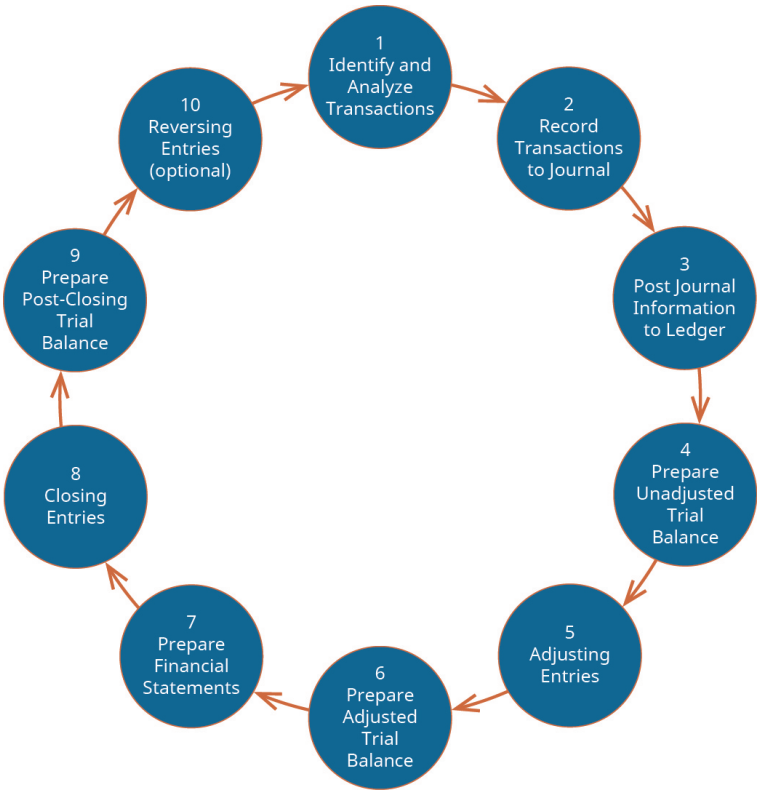


Figure 1.33 The Accounting Cycle. *Rice University. Source: Openstax CC BY NC-SA Long Description*

We next take a look at a comprehensive example that works through the entire accounting cycle for Clip'em Cliff. Clifford Girard retired from the US Marine Corps after 20 years of active duty. Cliff decides it would be fun to become a barber and open his own shop called "Clip'em Cliff." He will run the barber shop out of his home for the first couple of months while he identifies a new location for his shop.

Since his Marines career included several years of logistics, he is also going to operate a consulting practice where he will help

budding barbers create a barbering practice. He will charge a flat fee or a per hour charge. His consulting practice will be recognized as service revenue and will provide additional revenue while he develops his barbering practice.

He obtains a barber's license after the required training and is ready to open his shop on August 1. Table 1.3 shows his transactions from the first month of business.

Table 1.3 Transactions for August By: Rice University OpenStax CC BY-NC-SA 4.0

Date	Transaction
Aug. 1	Cliff issues $70,000 shares of common stock for cash.
Aug. 3	Cliff purchases barbering equipment for $45,000; $37,500 was paid immediately with cash, and the remaining $7,500 was billed to Cliff with payment due in 30 days. He decided to buy used equipment, because he was not sure if he truly wanted to run a barber shop. He assumed that he will replace the used equipment with new equipment within a couple of years.
Aug. 6	Cliff purchases supplies for $300 cash.
Aug. 10	Cliff provides $4,000 in services to a customer who asks to be billed for the services.
Aug. 13	Cliff pays a $75 utility bill with cash.
Aug. 14	Cliff receives $3,200 cash in advance from a customer for services not yet rendered.
Aug. 16	Cliff distributed $150 cash in dividends to stockholders.
Aug. 17	Cliff receives $5,200 cash from a customer for services rendered.
Aug. 19	Cliff paid $2,000 toward the outstanding liability from the August 3 transaction.
Aug. 22	Cliff paid $4,600 cash in salaries expense to employees.
Aug. 28	The customer from the August 10 transaction pays $1,500 cash toward Cliff's account.

Transaction 1: On August 1, 2019, Cliff issues $70,000 shares of common stock for cash.

Analysis:

- Clip'em Cliff now has more cash. Cash is an asset, which is increasing on the debit side.
- When the company issues stock, this yields a higher common stock figure than before issuance. The common stock account is increasing on the credit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 1, 2019	Cash	70,000	
	Common Stock		70,000
	To recognize issuance of common stock		

Assets	=	Liabilities	+	Stockholders' Equity
+$70,000	=	+$0	+	+$70,000
$70,000	=	$0	+	$70,000

Transaction 2: On August 3, 2019, Cliff purchases barbering equipment for $45,000; $37,500 was paid immediately with cash, and the remaining $7,500 was billed to Cliff with payment due in 30 days.

Analysis:

- Clip'em Cliff now has more equipment than before. Equipment is an asset, which is increasing on the debit side for $45,000.
- Cash is used to pay for $37,500. Cash is an asset, decreasing on the credit side.
- Cliff asked to be billed, which means he did not pay cash immediately for $7,500 of the equipment. Accounts Payable is used to signal this short-term liability. Accounts payable is increasing on the credit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 3, 2019	Equipment Cash Accounts Payable *To recognize purchase of equipment*	45,000	 37,500 7,500

Assets	=	Liabilities	+	Stockholders' Equity
+$45,000 –$37,500	=	+$7,500	+	+$0
$ 7,500	=	$7,500	+	$0

Transaction 3: On August 6, 2019, Cliff purchases supplies for $300 cash.

Analysis:

- Clip'em Cliff now has less cash. Cash is an asset, which is decreasing on the credit side.
- Supplies, an asset account, is increasing on the debit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 6, 2019	Supplies Cash *To recognize supplies purchase*	300	 300

Assets	=	Liabilities	+	Stockholders' Equity
+$300 –$300	=	+$0	+	+$0
$0	=	$0	+	$0

Transaction 4: On August 10, 2019, provides $4,000 in services to a customer who asks to be billed for the services.

Analysis:

- Clip'em Cliff provided service, thus earning revenue. Revenue impacts equity, and increases on the credit side.
- The customer did not pay immediately for the service and owes Cliff payment. This is an Accounts Receivable for Cliff. Accounts Receivable is an asset that is increasing on the debit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 10, 2019	Accounts Receivable Service Revenue *To recognize revenue earned, customer purchased on account*	4,000	4,000

Assets	=	Liabilities	+	Stockholders' Equity
+$4,000	=	+$0	+	+$4,000
$4,000	=	$0	+	$4,000

Transaction 5: On August 13, 2019, Cliff pays a $75 utility bill with cash.

Analysis:

- Clip'em Cliff now has less cash than before. Cash is an asset that is decreasing on the credit side.
- Utility payments are billed expenses. Utility Expense negatively impacts equity, and increases on the debit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 13, 2019	Utility Expense Cash *To recognize payment of utility bill*	75	75

Assets	=	Liabilities	+	Stockholder's Equity
–$75	=	+$0	+	–$75
–$75	=	$0	+	–$75

Transaction 6: On August 14, 2019, Cliff receives $3,200 cash in advance from a customer for services to be rendered.

Analysis:

- Clip'em Cliff now has more cash. Cash is an asset, which is increasing on the debit side.
- The customer has not yet received services but already paid the company. This means the company owes the customer the service. This creates a liability to the customer, and revenue cannot yet be recognized. Unearned Revenue is the liability account, which is

increasing on the credit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 14, 2019	Cash	3,200	
	Unearned Revenue		3,200
	To recognize customer's advanced payment		

Assets	=	Liabilities	+	Stockholders' Equity
+$3,200	=	+$3,200	+	+$0
$3,200	=	$3,200	+	$0

Transaction 7: On August 16, 2019, Cliff distributed $150 cash in dividends to stockholders.

Analysis:

- Clip'em Cliff now has less cash. Cash is an asset, which is decreasing on the credit side.
- When the company pays out dividends, this decreases equity and increases the dividends account. Dividends increases on the debit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 16, 2019	Dividends	150	
	Cash		150
	To recognize distribution of dividends		

Assets	=	Liabilities	+	Stockholders' Equity
–$150	=	+$0	+	–$150
–$150	=	$0	+	–$150

Transaction 8: On August 17, 2019, Cliff receives $5,200 cash from a customer for services rendered.

Analysis:

- Clip'em Cliff now has more cash than before. Cash is an asset, which is increasing on the debit side.
- Service was provided, which means revenue can be recognized. Service Revenue increases equity. Service

Revenue is increasing on the credit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 17, 2019	Cash	5,200	
	Service Revenue		5,200
	To recognize revenue earned		

Assets	=	Liabilities	+	Stockholders' Equity
+$5,200	=	+$0	+	+$5,200
$5,200	=	$0	+	$5,200

Transaction 9: On August 19, 2019, Cliff paid $2,000 toward the outstanding liability from the August 3 transaction.

Analysis:

- Clip'em Cliff now has less cash. Cash is an asset, which is decreasing on the credit side.
- Accounts Payable is a liability account, decreasing on the debit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 19, 2019	Accounts Payable	2,000	
	Cash		2,000
	To recognize partial payment of liability		

Assets	=	Liabilities	+	Stockholders' Equity
–$2,000	=	–$2,000	+	+$0
–$2,000	=	–$2,000	+	$0

Transaction 10: On August 22, 2019, Cliff paid $4,600 cash in salaries expense to employees.

Analysis:

- Clip'em Cliff now has less cash. Cash is an asset, which is decreasing on the credit side.
- When the company pays salaries, this is an expense to the business. Salaries Expense reduces equity by increasing on the debit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 22, 2019	Salaries Expense	4,600	
	Cash		4,600
	To recognize employee salary payment		

Assets	=	Liabilities	+	Stockholders' Equity
–$4,600	=	+$0	+	–$4,600
–$4,600	=	$0	+	–$4,600

Transaction 11: On August 28, 2019, the customer from the August 10 transaction pays $1,500 cash toward Cliff's account.

Analysis:

- The customer made a partial payment on their outstanding account. This reduces Accounts Receivable. Accounts Receivable is an asset account decreasing on the credit side.
- Cash is an asset, increasing on the debit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 28, 2019	Cash	1,500	
	Accounts Receivable		1,500
	To recognize customer partial payment		

Assets	=	Liabilities	+	Stockholders' Equity
+$1,500 –$1,500	=	+$0	+	+$0
$0	=	$0	+	$0

The complete journal for August is presented in Figure 1.34.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 1, 2019	Cash	70,000	
	Common Stock		70,000
Aug. 3, 2019	Equipment	45,000	
	Cash		37,500
	Account Payable		7,500
Aug. 6, 2019	Supplies	300	
	Cash		300
Aug. 10, 2019	Accounts Receivable	4,000	
	Service Revenue		4,000
Aug. 13, 2019	Utility Expense	75	
	Cash		75
Aug. 14, 2019	Cash	3,200	
	Unearned Revenue		3,200
Aug. 16, 2019	Dividends	150	
	Cash		150
Aug. 17, 2019	Cash	5,200	
	Service Revenue		5,200
Aug. 19, 2019	Accounts Payable	2,000	
	Cash		2,000
Aug. 22, 2019	Salaries Expense	4,600	
	Cash		4,600
Aug. 28, 2019	Cash	1,500	
	Accounts Receivable		1,500

Figure 1.34 Journal Entries for August. *Rice University. Source: Openstax CC BY NC-SA Long Description*

Once all journal entries have been created, the next step in the accounting cycle is to post journal information to the ledger. The ledger is visually represented by T-accounts. Cliff will go through each transaction and transfer the account information into the debit or credit side of that ledger account. Any account

that has more than one transaction needs to have a final balance calculated. This happens by taking the difference between the debits and credits in an account.

Clip'em Cliff's ledger represented by T-accounts is presented in Figure 1.35.

Cash	
Aug. 1 70,000	37,500 Aug. 3
Aug. 14 3,200	300 Aug. 6
Aug. 17 5,200	75 Aug. 13
Aug. 28 1,500	150 Aug. 16
	2,000 Aug. 19
	4,600 Aug. 22
Bal. 35,275	

Accounts Payable	
Aug. 19 2,000	7,500 Aug. 3
	Bal. 5,500

Common Stock	
	70,000 Aug. 1
	Bal. 70,000

Accounts Receivable	
Aug. 10 4,000	1,500 Aug. 28
Bal. 2,500	

Unearned Revenue	
	3,200 Aug. 14
	Bal. 3,200

Dividends	
Aug. 16 150	
Bal. 150	

Supplies	
Aug. 6 300	
Bal. 300	

Service Revenue	
	4,000 Aug. 10
	5,200 Aug. 17
	Bal. 9,200

Equipment	
Aug. 3 45,000	
Bal. 45,000	

Salaries Expense	
Aug. 22 4,600	
Bal. 4,600	

Utility Expense	
Aug. 13 75	
Bal. 75	

Figure 1.35 T-Accounts for August. *Rice University. Source: Openstax CC BY NC-SA Long Description*

You will notice that the sum of the asset account balances in Cliff's ledger equals the sum of the liability and equity account balances at $83,075. The final debit or credit balance in each account is transferred to the unadjusted trial balance in the corresponding debit or credit column as illustrated in Figure 1.36.

CLIP'EM CLIFF
Unadjusted Trial Balance
August 31, 2019

Account	Debit	Credit
Cash	$35,275	
Accounts Receivable	2,500	
Supplies	300	
Equipment	45,000	
Accounts Payable		$ 5,500
Unearned Revenue		3,200
Common Stock		70,000
Dividends	150	
Service Revenue		9,200
Salaries Expense	4,600	
Utility Expense	75	
Total	$87,900	$87,900

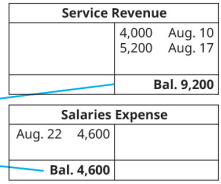


Figure 1.36 Unadjusted Trial Balance for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

Once all of the account balances are transferred to the correct columns, each column is totaled. The total in the debit column must match the total in the credit column to remain balanced. The unadjusted trial balance for Clip'em Cliff appears in Figure 1.37.

CLIP'EM CLIFF Unadjusted Trial Balance August 31, 2019		
Account	**Debit**	**Credit**
Cash	$35,275	
Accounts Receivable	2,500	
Supplies	300	
Equipment	45,000	
Accounts Payable		$ 5,500
Unearned Revenue		3,200
Common Stock		70,000
Dividends	150	
Service Revenue		9,200
Salaries Expense	4,600	
Utility Expense	75	
Total	$87,900	$87,900

Figure 1.37 Unadjusted Trial Balance for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

The unadjusted trial balance shows a debit and credit balance of $87,900. Remember, the unadjusted trial balance is prepared before any period-end adjustments are made.

On August 31, Cliff has the transactions shown in Table 1.4 requiring adjustment.

Table 1.4 August 31 Transactions. By: Rice University OpenStax CC BY-NC-SA 4.0

Date	Transaction
Aug. 31	Cliff took an inventory of supplies and discovered that $250 of supplies remain unused at the end of the month.
Aug. 31	The equipment purchased on August 3 depreciated $2,500 during the month of August.
Aug. 31	Clip'em Cliff performed $1,100 of services during August for the customer from the August 14 transaction.
Aug. 31	Reviewing the company bank statement, Clip'em Cliff discovers $350 of interest earned during the month of August that was previously uncollected and unrecorded. As a new customer for the bank, the interest was paid by a bank that offered an above-market-average interest rate.
Aug. 31	Unpaid and previously unrecorded income taxes for the month are $3,400. The tax payment was to cover his federal quarterly estimated income taxes. He lives in a state that does not have an individual income tax

Adjusting Transaction 1: Cliff took an inventory of supplies and discovered that $250 of supplies remain unused at the end of the month.

Analysis:

- $250 of supplies remain at the end of August. The company began the month with $300 worth of supplies. Therefore, $50 of supplies were used during the month and must be recorded (300 – 250). Supplies is an asset that is decreasing (credit).
- Supplies is a type of prepaid expense, that when used, becomes an expense. Supplies Expense would increase (debit) for the $50 of supplies used during August.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Supplies Expense Supplies *To recognize supply usage for August*	50	50

Assets	=	Liabilities	+	Stockholders' Equity
–$50	=	+$0	+	–$50
–$50	=	$0	+	–$50

Adjusting Transaction 2: The equipment purchased on August 3 depreciated $2,500 during the month of August.

Analysis:

- Equipment cost of $2,500 was allocated during August. This depreciation will affect the Accumulated Depreciation–Equipment account and the Depreciation Expense–Equipment account. While we are not doing depreciation calculations here, you will come across more complex calculations, such as depreciation in Long-Term Assets.
- Accumulated Depreciation–Equipment is a contra asset account (contrary to Equipment) and increases (credit) for $2,500.
- Depreciation Expense–Equipment is an expense account that is increasing (debit) for $2,500.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Depreciation Expense - Equipment Accumulated Depreciation - Equipment *To recognize equipment depreciation for August*	2,500	2,500

Assets	=	Liabilities	+	Stockholders' Equity
–$2,500	=	+$0	+	–$2,500
–$2,500	=	$0	+	–$2,500

Adjusting Transaction 3: Clip'em Cliff performed $1,100 of services during August for the customer from the August 14 transaction.

Analysis:

- The customer from the August 14 transaction gave the company $3,200 in advanced payment for services. By the end of August the company had earned $1,100 of the advanced payment. This means that the company still has yet to provide $2,100 in services to that customer.
- Since some of the unearned revenue is now earned, Unearned Revenue would decrease. Unearned Revenue is a liability account and decreases on the debit side.
- The company can now recognize the $1,100 as earned revenue. Service Revenue increases (credit) for $1,100.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Unearned Revenue	1,100	
	Service Revenue		1,100
	To recognize revenue earned from Aug. 14 transaction		

Assets	=	Liabilities	+	Stockholders' Equity
$0	=	–$1,100	+	+$1,100
$0	=	–$1,100	+	$1,100

Adjusting Transaction 4: Reviewing the company bank statement, Clip'em Cliff identifies $350 of interest earned during the month of August that was previously unrecorded.

Analysis:

- Interest is revenue for the company on money kept in a money market account at the bank. The company only sees the bank statement at the end of the month and needs to record as received interest revenue reflected on the bank statement.
- Interest Revenue is a revenue account that increases (credit) for $350.
- Since Clip'em Cliff has yet to collect this interest revenue, it is considered a receivable. Interest Receivable increases (debit) for $350.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Interest Receivable Interest Revenue *To recognize interest revenue earned but not yet collected*	350	350

Assets	=	Liabilities	+	Stockholders' Equity
+$350	=	$0	+	+$350
+$350	=	$0	+	+$350

Adjusting Transaction 5: Unpaid and previously unrecorded income taxes for the month are $3,400.

Analysis:

- Income taxes are an expense to the business that accumulate during the period but are only paid at predetermined times throughout the year. This period did not require payment but did accumulate income tax.
- Income Tax Expense is an expense account that negatively affects equity. Income Tax Expense increases on the debit side.
- The company owes the tax money but has not yet paid, signaling a liability. Income Tax Payable is a liability that is increasing on the credit side.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Income Tax Expense Income Tax Payable *To recognize taxes incurred but not yet paid*	3,400	3,400

Assets	=	Liabilities	+	Stockholders' Equity
$0	=	+$3,400	+	–$3,400
$0	=	$3,400	+	–$3,400

The summary of adjusting journal entries for Clip'em Cliff is presented in Figure 1.38.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Supplies Expense Supplies	50	 50
Aug. 31, 2019	Depreciation Expense: Equipment Accumulated Depreciation: Equipment	2,500	 2,500
Aug. 31, 2019	Unearned Revenue Service Revenue	1,100	 1,100
Aug. 31, 2019	Interest Receivable Interest Revenue	350	 350
Aug. 31, 2019	Income Tax Expense Income Tax Payable	3,400	 3,400

Figure1.38 Adjusting Journal Entries for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

Now that all of the adjusting entries are journalized, they must be posted to the ledger. Posting adjusting entries is the same process as posting the general journal entries. Each journalized account figure will transfer to the corresponding ledger account on either the debit or credit side as illustrated in Figure 1.39.

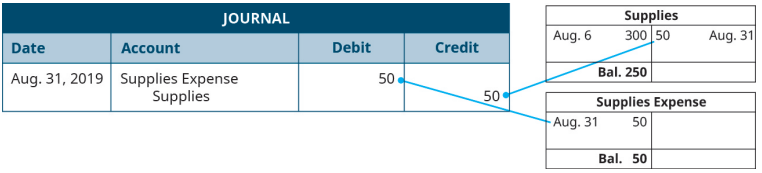


Figure 1.39 Posting Ledger Entries for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

We would normally use a general ledger, but for illustrative purposes, we are using T-accounts to represent the ledgers. The T-accounts after the adjusting entries are posted are presented in Figure 1.40.

Cash	
Aug. 1 70,000	37,500 Aug. 3
Aug. 14 3,200	300 Aug. 6
Aug. 17 5,200	75 Aug. 13
Aug. 28 1,500	150 Aug. 16
	2,000 Aug. 19
	4,600 Aug. 22
Bal. 35,275	

Accounts Payable	
Aug. 19 2,000	7,500 Aug. 3
	Bal. 5,500

Common Stock	
	70,000 Aug. 1
	Bal. 70,000

Accounts Receivable	
Aug. 10 4,000	1,500 Aug. 28
Bal. 2,500	

Unearned Revenue	
Aug. 31 1,100	3,200 Aug. 14
	Bal. 2,100

Dividends	
Aug. 16 150	
Bal. 150	

Interest Receivable	
Aug. 31 350	
Bal. 350	

Income Tax Payable	
	3,400 Aug. 31
	Bal. 3,400

Service Revenue	
	4,000 Aug. 10
	5,200 Aug. 17
	1,100 Aug. 31
	Bal. 10,300

Supplies	
Aug. 6 300	50 Aug. 31
Bal. 250	

Interest Revenue	
	350 Aug. 31
	Bal. 350

Equipment	
Aug. 3 45,000	
Bal. 45,000	

Salaries Expense	
Aug. 22 4,600	
Bal. 4,600	

Accumulated Depreciation: Equipment	
	2,500 Aug. 31
	Bal. 2,500

Utility Expense	
Aug. 13 75	
Bal. 75	

Supplies Expense	
Aug. 31 50	
Bal. 50	

Depreciation Expense: Equipment	
Aug. 31 2,500	
Bal. 2,500	

Income Tax Expense	
Aug. 31 3,400	
Bal. 3,400	

Figure 1.40 Ledger Entries (in T-Accounts) for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

You will notice that the sum of the asset account balances equals the sum of the liability and equity account balances at $80,875. The final debit or credit balance in each account

is transferred to the adjusted trial balance, the same way the general ledger transferred to the unadjusted trial balance.

The next step in the cycle is to prepare the adjusted trial balance. Clip'em Cliff's adjusted trial balance is shown in Figure 1.41.

CLIP'EM CLIFF Adjusted Trial Balance For the Month Ended August 31, 2019		
Account	**Debit**	**Credit**
Cash	$35,275	
Accounts Receivable	2,500	
Interest Receivable	350	
Supplies	250	
Equipment	45,000	
Accumulated Depreciation: Equipment		$ 2,500
Accounts Payable		5,500
Unearned Revenue		2,100
Income Tax Payable		3,400
Common Stock		70,000
Dividends	150	
Interest Revenue		350
Service Revenue		10,300
Supplies Expense	50	
Depreciation Expense: Equipment	2,500	
Income Tax Expense	3,400	
Salaries Expense	4,600	
Utility Expense	75	
Total	$94,150	$94,150

Figure 1.41 Adjusted Trial Balance for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

The adjusted trial balance shows a debit and credit balance of $94,150. Once the adjusted trial balance is prepared, Cliff can prepare his financial statements (step 7 in the cycle). We only prepare the income statement, statement of retained earnings, and the balance sheet. The statement of cash flows is discussed in detail in Statement of Cash Flows.

To prepare your financial statements, you want to work with your adjusted trial balance.

Remember, revenues and expenses go on an income statement. Dividends, net income (loss), and retained earnings balances go on the statement of retained earnings. On a balance sheet you find assets, contra assets, liabilities, and stockholders' equity accounts.

The income statement for Clip'em Cliff is shown in Figure 1.42.

CLIP'EM CLIFF Income Statement For the Month Ended August 31, 2019		
Revenues		
Interest Revenue	$ 350	
Service Revenue	10,300	
Total Revenues		$10,650
Expenses		
Supplies Expense	50	
Depreciation Expense: Equipment	2,500	
Salaries Expense	4,600	
Utility Expense	75	
Income Tax Expense	3,400	
Total Expenses		10,625
Net Income		$ 25

Figure 1.42 Adjusted Trial Balance for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

Note that expenses were only $25 less than revenues. For the first month of operations, Cliff welcomes any income. Cliff will want to increase income in the next period to show growth for investors and lenders.

Next, Cliff prepares the following statement of retained earnings (Figure 1.43).

CLIP'EM CLIFF Statement of Retained Earnings For the Month Ended August 31, 2019	
Beginning Retained Earnings (Aug. 1)	$ 0
Net Income	25
Dividends	(150)
Ending Retained Earnings (Aug. 31)	$(125)

Figure 1.43 Statement of Retained Earnings for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

The beginning retained earnings balance is zero because Cliff just began operations and does not have a balance to carry over to a future period. The ending retained earnings balance is –$125. You probably never want to have a negative value on your retained earnings statement, but this situation is not totally unusual for an organization in its initial operations. Cliff will want to improve this outcome going forward. It might make sense for Cliff to not pay dividends until he increases his net income.

Cliff then prepares the balance sheet for Clip'em Cliff as shown in Figure 1.44.

CLIP'EM CLIFF Balance Sheet August 31, 2019		
Assets		
Cash		$35,275
Accounts Receivable		2,500
Interest Receivable		350
Supplies		250
Equipment	$45,000	
Accumulated Depreciation: Equipment	2,500	42,500
Total Assets		**$80,875**
Liabilities		
Accounts Payable		$ 5,500
Income Tax Payable		3,400
Unearned Revenue		2,100
Total Liabilities		11,000
Stockholders' Equity		
Common Stock		70,000
Ending Retained Earnings		(125)
Total Stockholders' Equity		69,875
Total Liabilities and Stockholders' Equity		**$80,875**

Figure 1.44 Balance Sheet for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

The balance sheet shows total assets of $80,875, which equals total liabilities and equity. Now that the financial statements are complete, Cliff will go to the next step in the accounting cycle, preparing and posting closing entries. To do this, Cliff needs his adjusted trial balance information.

Cliff will only close temporary accounts, which include revenues, expenses, income summary, and dividends. The first entry closes revenue accounts to income summary. To close revenues, Cliff will debit revenue accounts and credit income summary.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Service Revenue Interest Revenue Income Summary *To close revenue accounts to Income Summary*	10,300 350	 10,650

The second entry closes expense accounts to income summary. To close expenses, Cliff will credit expense accounts and debit income summary.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Income Summary Supplies Expense Depreciation Expense: Equipment Income Tax Expense Salaries Expense Utility Expense *To close expense accounts to Income Summary*	10,625	 50 2,500 3,400 4,600 75

The third entry closes income summary to retained earnings. To find the balance, take the difference between the income summary amount in the first and second entries (10,650 – 10,625). To close income summary, Cliff would debit Income Summary and credit Retained Earnings.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Income Summary Retained Earnings *To close Income Summary to Retained Earnings*	25	 25

The fourth closing entry closes dividends to retained earnings. To close dividends, Cliff will credit Dividends, and debit Retained Earnings.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 31, 2019	Retained Earnings Dividends *To close Dividends to Retained Earnings*	150	 150

Once all of the closing entries are journalized, Cliff will post this information to the ledger. The closed accounts with their final balances, as well as Retained Earnings, are presented in Figure 1.45.

Dividends			
Aug. 16	150	150	Aug. 31 cls.
Bal. 0			

Supplies Expense			
Aug. 31	50	50	Aug. 31 cls.
Bal. 0			

Service Revenue			
Aug. 31 cls.	10,300	4,000	Aug. 10
		5,200	Aug. 17
		1,100	Aug. 31
		Bal. 0	

Depreciation Expense: Equipment			
Aug. 31	2,500	2,500	Aug. 31 cls.
Bal. 0			

Interest Revenue			
Aug. 31 cls.	350	350	Aug. 31
		Bal. 0	

Income Tax Expense			
Aug. 31	3,400	3,400	Aug. 31 cls.
Bal. 0			

Salaries Expense			
Aug. 22	4,600	4,600	Aug. 31 cls.
Bal. 0			

Income Summary			
Aug. 31 cls. #2	10,625	10,650	Aug. 31 cls. #1
Aug. 31 cls. #3	25	25	
Bal. 0			

Utility Expense			
Aug. 13	75	75	Aug. 31 cls.
Bal. 0			

Retained Earnings			
Aug. 31 cls. #4	150	25	Aug. 31 cls. #3
Bal. 125			

Figure 1.45 Closed Accounts with Final Balances for Clip'em Cliff. *Rice University. Source: Openstax CC BY NC-SA Long Description*

Now that the temporary accounts are closed, they are ready for accumulation in the next period.

The last step for the month of August is step 9, preparing the post-closing trial balance. The post-closing trial balance should only contain permanent account information. No temporary accounts should appear on this trial balance. Clip'em Cliff's post-closing trial balance is presented in Figure 1.46.

CLIP'EM CLIFF Post-closing Trial Balance For the Month Ended August 31, 2019		
Account	**Debit**	**Credit**
Cash	$35,275	
Accounts Receivable	2,500	
Interest Receivable	350	
Supplies	250	
Equipment	45,000	
Accumulated Depreciation: Equipment		$ 2,500
Accounts Payable		5,500
Unearned Revenue		2,100
Income Tax Payable		3,400
Common Stock		70,000
Retained Earnings	125	
Total	$83,500	$83,500

Figure 1.46 Post-Closing Trial Balance for Clip'em Cliff*. Rice University. Source: Openstax CC BY NC-SA Long Description*

At this point, Cliff has completed the accounting cycle for August. He is now ready to begin the process again for September, and future periods.

CONCEPTS IN PRACTICE

Reversing Entries

One step in the accounting cycle that we did not cover is reversing entries. Reversing entries can be made at the beginning of a new period to certain accruals. The company will reverse adjusting entries made in the prior period to the revenue and expense accruals.

It can be difficult to keep track of accruals from prior periods,

as support documentation may not be readily available in current or future periods. This requires an accountant to remember when these accruals came from. By reversing these accruals, there is a reduced risk for counting revenues and expenses twice. The support documentation received in the current or future period for an accrual will be easier to match to prior revenues and expenses with the reversal.

Long Descriptions

A large circle labeled, in the center, The Accounting Cycle. The large circle consists of 10 smaller circles with arrows pointing from one smaller circle to the next one. The smaller circles are labeled, in clockwise order: 1 Identify and Analyze Transactions; 2 Record Transactions to Journal; 3 Post Journal Information to Ledger; 4 Prepare Unadjusted Trial Balance; 5 Adjusting Entries; 6 Prepare Adjusted Trial Balance; 7 Prepare Financial Statements; 8 Closing Entries; 9 Prepare Post-Closing Trial Balance; 10 Reversing Entries (optional). Return

Journal entries. August 1, 2019 debit Cash and credit Common Stock for 70,000. August 3, 2019 debit Equipment for 45,000 and credit Cash for 37,500 and Accounts Payable for 7,500. August 6, 2019 debit Supplies and credit Cash for 300. August 10, 2019 debit Accounts Receivable and credit Service Revenue for 4,000. August 13, 2019 debit Utilities Expense and credit Cash for 75. August 14, 2019 debit Cash 3,200 and credit Unearned Revenue for 3,200. August 16, 2019 debit Dividends and credit Cash for 150. August 17, 2019 debit Cash and credit Service Revenue for 5,200. August 19, 2019 debit Accounts Payable and credit Cash for 2,000. August 22, 2019 debit Salaries Expense and credit Cash for 4,600. August 28, 2019 debit Cash and credit Accounts Receivable for 1,500. Return

Cash has an August 1 debit entry of 70,000, an August 3 credit entry of 37,500, an August 6 credit entry of 300, an v 13 credit

entry of 75, a August 14 debit entry of 3,200, an August 16 credit entry of 150, an August 17 debit entry of 5,200, an August 19 credit entry of 2,000, an August 22 credit entry of 4,600, and an August 28 debit entry of 1,500, leaving a debit balance of 35,275. Accounts Receivable has an August 10 debit entry of 4,000, an August 28 credit entry of 1,500, and a debit balance of 2,500. Supplies has an August 6 debit entry of 300 and a debit balance of 300. Equipment has an August 3 debit entry of 45,000 and a debit balance of 45,000. Accounts Payable has an August 3 credit entry of 7,500, an August 19 debit entry of 2,000 and a credit balance of 5,500. Unearned Revenue has a credit August 14 entry of 3,200 and a credit balance of 3,200 Common Stock has an August 1 credit entry of 70,000 and a credit balance of 70,000. Dividends has an August 16 debit entry of 150, and a debit balance of 150. Service Revenue account has 2 entries on the credit side: August 10 4,000, and Aug 17 5,200. The total on the credit side is then 9,200. Salaries Expense has an August 22 debit side entry for 4,600 and a debit side balance of 4,600. Utilities Expense has an August 13 debit side entry for 75, and a debit side balance of 75. Return

Clip'em Cliff, Unadjusted Trial Balance, August 31, 2019. Cash 35,275 debit. Accounts receivable 2,500 debit. Supplies 300 debit. Equipment 45,000 debit. Accounts Payable 5,500 credit. Unearned Revenue 3,200 credit. Common Stock 70,000 credit. Dividends 150 debit. Service Revenue 9,200 credit. Salaries Expense 4,600 debit. Utility Expense 75 debit. Total debits and credits are each 87,900. The ledger pages for Service Revenue and Salaries Expense are showing their balances being put into the Unadjusted Trial Balance as an example for all the balances. Return

Clip'em Cliff, Unadjusted Trial Balance, August 31, 2019. Cash 35,275 debit. Accounts receivable 2,500 debit. Supplies 300 debit. Equipment 45,000 debit. Accounts Payable 5,500 credit. Unearned Revenue 3,200 credit. Common Stock 70,000 credit. Dividends 150 debit. Service Revenue 9,200 credit. Salaries

Expense 4,600 debit. Utility Expense 75 debit. Total debits and credits are each 87,900. Return

Journal entries: August 31, 2019 debit Supplies Expense, credit Supplies 50. August 31, 2019 debit Depreciation Expense: Equipment, credit Accumulated Depreciation: Equipment 2,500. August 31, 2019 debit Unearned Revenue, credit Service revenue 1,100. August 31, 2019 debit Interest Receivable, credit Interest revenue 350. August 31, 2019 debit Income Tax Expense, credit Income Tax Payable 3,400. Return

Journal entry August 31, 2019 debit Supplies Expense, credit Supplies 50. There is an arrow from the debit 50 to the page from the Supplies Expense ledger account where that debit is shown on the debit side. There is an arrow from the credit 50 to the page from the Supplies ledger account where that credit is shown on the credit side (along with the August 6 debit of 300, resulting in a new balance of 250). Return

T-Accounts. Cash has an August 1 debit entry of 70,000, an August 3 credit entry of 37,500, an August 6 credit entry of 300, an August 13 credit entry of 75, a August 14 debit entry of 3,200, an August 16 credit entry of 150, an August 17 debit entry of 5,200, an August 19 credit entry of 2,000, an August 22 credit entry of 4,600, and an August 28 debit entry of 1,500, leaving a debit balance of 35,275. Accounts Receivable has an August 10 debit entry of 4,000, an August 28 credit entry of 1,500, and a debit balance of 2,500. Interest Receivable has an August 31 debit entry of 350 and a debit balance of 350. Supplies has an August 6 debit entry of 300, and August 31 credit entry of 50 and a debit balance of 250. Equipment has an August 3 debit entry of 45,000 and a debit balance of 45,000. Accumulated Depreciation has an August 31 credit entry of 2,500 and a credit balance of 2,500 Accounts Payable has an August 3 credit entry of 7,500, an August 19 debit entry of 2,000 and a credit balance of 5,500. Unearned Revenue has a credit August 14 entry of 3,200, an August 31 debit entry of 1,100 and a credit balance of 2,100. Income Tax Payable has an August 31 credit entry for

3,400 and a credit balance of 3,400. Common Stock has an August 1 credit entry of 70,000 and a credit balance of 70,000. Dividends has an August 16 debit entry of 150, and a debit balance of 150. Service Revenue account has 3 entries on the credit side: August 10 4,000, August 17 5,200, and August 31 of 1,100. The total on the credit side is then 10,300. Salaries Expense has an August 22 debit side entry for 4,600 and a debit side balance of 4,600. Utilities Expense has an August 13 debit side entry for 75, and a debit side balance of 75. Supplies Expense has a debit entry on August 31 of 50 and a debit balance of 50. Depreciation Expense: Equipment has a debit entry on August 31 of 2,500 and a debit balance of 2,500. Income Tax Expense has a debit entry on August 31 of 3,400 and a debit balance of 3,400. Return

Clip'em Cliff, Unadjusted Trial Balance, August 31, 2019. Cash 35,275 debit. Accounts receivable 2,500 debit. Interest receivable 350 debit. Supplies 250 debit. Equipment 45,000 debit. Accumulated Depreciation: Equipment 2,500 credit. Accounts Payable 5,500 credit. Unearned Revenue 2,100 credit. Income Tax Payable 3,400 credit. Common Stock 70,000 credit. Dividends 150 debit. Interest Revenue 350 credit. Service Revenue 10,300 credit. Supplies Expense 50 debit. Depreciation Expense: Equipment 2,500 debit. Income Tax Expense 3,400 debit. Salaries Expense 4,600 debit. Utility Expense 75 debit. Total debits and credits are each 94,150. Return

Clip'em Cliff, Income Statement, For the Month Ended August 31, 2019. Revenues: Interest revenue $350, Service Revenue 10,300. Total Revenues $10,650. Expenses: Supplies Expense 50, Depreciation Expense: Equipment 2,500, Salaries Expense 4,600, Utilities Expense 75, Income Tax Expense 3,400. Total Expenses 10,625. Net Income $25. Return

Clip'em Cliff, Statement of Retained Earnings, For the Month Ended August 31, 2019. Beginning Retained earnings (August 1) $0, Net Income 25 less Dividends 150 equals Ending Retained Earnings (August 31) (125). Return

Clip'em Cliff, Balance Sheet, For the Month Ended August 31, 2019. Assets: Cash $35,275, Accounts receivable 2,500, Interest Receivable 350, Supplies 250, Equipment 45,000 less Accumulated Depreciation: Equipment equals 42,500. Total Assets are $80,875. Liabilities: Accounts Payable 5,500, Income Tax Payable 3,400, Unearned revenue 2,100. Total Liabilities 11,000. Stockholders' Equity: Common Stock 70,000, Ending Retained Earnings (125), Total Stockholders' equity 69,875. Total Liabilities and Stockholders' equity 80,875. Return

T-Accounts. Dividends has an August 16 debit entry of 150, an August 31 credit closing entry of 150 and a debit balance of 0. Service Revenue account has 3 entries on the credit side: August 10 4,000, August 17 5,200, and August 31 of 1,100. It has a debit closing entry on August 31 of 10,300. The total on the credit side is then 0. Interest revenue has an August 31 credit entry of 350, an August 31 debit closing entry of 350, leaving a credit balance of 0. Salaries Expense has an August 22 debit side entry for 4,600, a credit side closing entry on August 31 for 4,600, and a debit side balance of 0. Utilities Expense has a August 13 debit side entry for 75, an August 31 closing credit entry of 75, and a debit side balance of 0. Supplies Expense has a debit entry on August 31 of 50, a closing credit entry of 50 on August 31, and a debit balance of 0. Depreciation Expense: Equipment has a debit entry on August 31 of 2,500, a credit side closing entry on August 31 for 2,500 and a debit balance of 0. Income Tax Expense has a debit entry on August 31 of 3,400, a closing credit entry of 3,400 on August 31, and a debit balance of 0. Income Summary has a credit closing entry #1, for 10,650, a debit closing entry #2 for 10,625, leaving a 25 credit balance, a debit closing entry #3 for 25, leaving an ending balance of 0. Retained Earnings has a credit closing entry #3 for 25, a debit closing entry #4 for 150, leaving a balance of 125. Return

Clip'em Cliff, Post-Closing Trial Balance, August 31, 2019. Cash 35,275 debit. Accounts receivable 2,500 debit. Interest receivable 350 debit. Supplies 250 debit. Equipment 45,000

debit. Accumulated Depreciation: Equipment 2,500 credit. Accounts Payable 5,500 credit. Unearned Revenue 2,100 credit. Income Tax Payable 3,400 credit. Common Stock 70,000 credit. Retained Earnings 125 debit. Total debits and total credits are both 83,500. Return

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CHAPTER 2- ACCOUNTING FOR MERCHANDISERS

Shifting Gears to Merchandising

2.1 Merchandisers v. Service Providers

Every week, you run errands for your household. These errands may include buying products and services from local retailers, such as gas, groceries, and clothing. As a consumer, you are focused solely on purchasing your items and getting home to your family. You are probably not thinking about how your purchases impact the businesses you frequent. Whether the business is a service or a merchandising company, it tracks sales from customers, purchases from manufacturers or other suppliers, and costs that affect their everyday operations. There are some key differences between these business types in the manner and detail required for transaction recognition.

Comparison of Merchandising Transactions versus Service Transactions

Some of the biggest differences between a service company and a merchandising company are what they sell, their typical financial transactions, their operating cycles, and how these translate to financial statements.

A service company provides intangible services to customers and does not have inventory. Some examples of service companies include lawyers, doctors, consultants, and accountants. Service companies often have simple financial transactions that involve taking customer deposits, billing clients after services have been provided, providing the service, and processing payments. These activities may occur

frequently within a company's accounting cycle and make up a portion of the service company's operating cycle.

An operating cycle is the amount of time it takes a company to use its cash to provide a product or service and collect payment from the customer. Completing this cycle faster puts the company in a more stable financial position. A typical operating cycle for a service company begins with having cash available, providing service to a customer, and then receiving cash from the customer for the service.

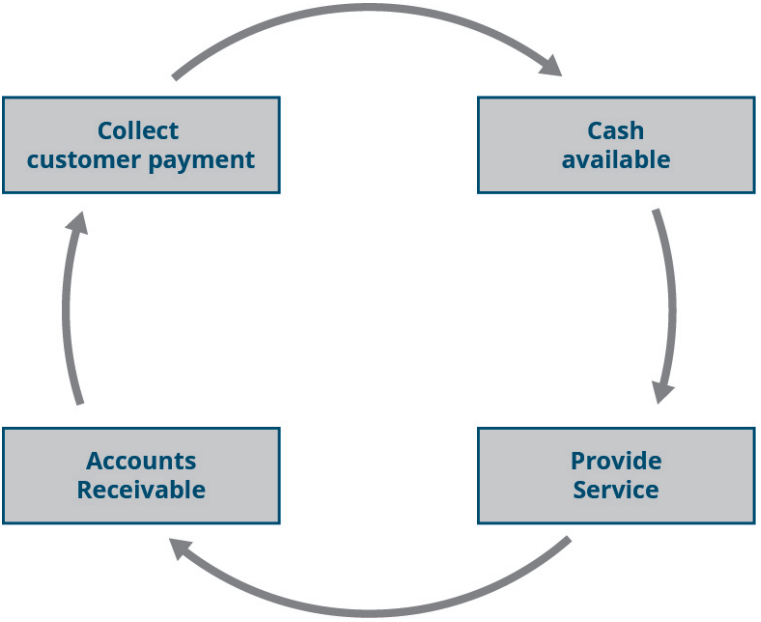


Figure 2.1 Typical Operating Cycle for a Service Firm *The stages of a Service Firm's Operating Cycle. Typical Operating Cycle for a Service Firm. By: Rice University. Source: Openstax CC BY NC-SA*

The income statement format is fairly simple as well. Revenues (sales) are reported first, followed by any period operating expenses. The outcome of sales less expenses, which is net income (loss), is calculated from these accounts.

APPLE GOODS Income Statement Year Ended December 31, 2018	
Sales	$300,000
Expenses	175,000
Net Income (Loss)	125,000

Figure 2.2 Service Company Income Statement *Expenses are subtracted directly from Sales to produce net income (loss). Service Company Income Statement. By: Rice University Source: OpenStax CC BY-NC-SA 4.0*

A merchandising company resells finished goods (inventory) produced by a manufacturer (supplier) to customers. Some examples of merchandising companies include **Walmart**, **Macy's**, and **Home Depot**. Merchandising companies have financial transactions that include: purchasing merchandise, paying for merchandise, storing inventory, selling merchandise, and collecting customer payments. A typical operating cycle for a merchandising company starts with having cash available, purchasing inventory, selling the merchandise to customers, and finally collecting payment from customers.

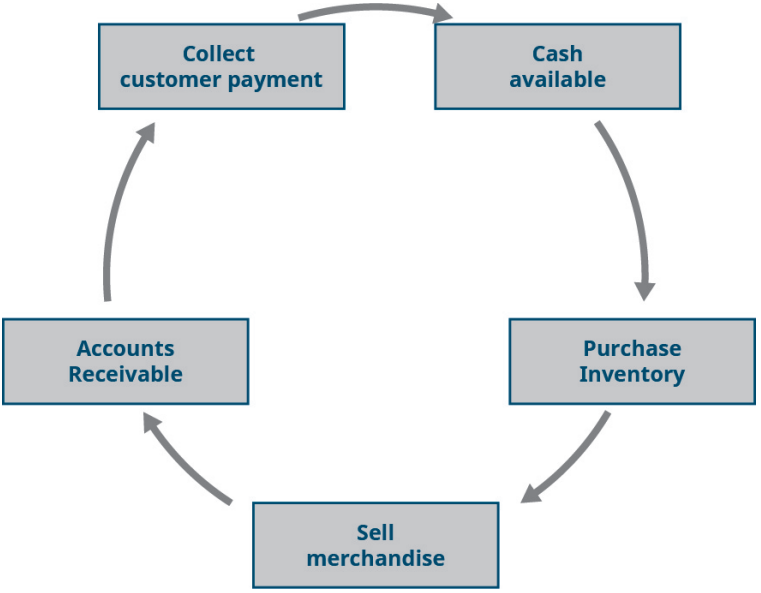


Figure 2.3 Typical Operating Cycle for a Merchandising Company
Typical Operating Cycle for a Merchandising Company. By: Rice University Source: Openstax CC BY-NC-SA 4.0

Note that unlike a service company, the merchandiser, also sometimes labeled as a retailer, must first resolve any sale reductions and merchandise costs, known as Cost of Goods Sold, before determining other expenses and net income (loss). A simple retailer income statement is shown in Figure 2.4 for comparison.

AIR SUPPLY PLUS Income Statement Year Ended December 31, 2018	
Net Sales	$350,000
Cost of Goods Sold	50,000
Gross Margin	300,000
Expenses	100,000
Net Income (Loss)	$200,000

Figure 2.4 Merchandise Company Income Statement *Cost of Goods Sold is deducted from net sales to calculate gross margin. Merchandise Company Income Statement. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Characteristics of Merchandising Transactions

Merchandising transactions are separated into two categories: purchases and sales. In general, a purchase transaction occurs between a manufacturer and the merchandiser, also called a retailer. A sales transaction occurs between a customer and the merchandiser or retailer. We will now discuss the characteristics that create purchase and sales transactions for a retailer. A merchandiser will need to purchase merchandise for its business to continue operations and can use several purchase situations to accomplish this.

Purchases with Cash or on Credit

A retailer typically conducts business with a manufacturer or with a supplier who buys from a manufacturer. The retailer will purchase their finished goods for resale. When the purchase

occurs, the retailer may pay for the merchandise with cash or on credit. If the retailer pays for the merchandise with cash, they would be trading one current asset, Cash, for another current asset, Merchandise Inventory or just Inventory, depending upon the company's account titles. In this example, they would record a debit entry to Merchandise Inventory and a credit entry to Cash. If they decide to pay on credit, a liability would be created, and Accounts Payable would be credited rather than Cash. For example, a clothing store may pay a jeans manufacturer cash for 50 pairs of jeans, costing $25 each. The following entry would occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Merchandise Inventory	1,250	
	Cash		1,250
	To recognize purchase with cash		

Figure 2.5
By: Rice University
Source: Openstax
CC BY NC-SA 4.0

If this same company decides to purchase merchandise on credit, Accounts Payable is credited instead of Cash.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Merchandise Inventory	1,250	
	Accounts Payable		1,250
	To recognize purchase on credit		

Figure 2.6
By: Rice University
Source: Openstax
CC BY NC-SA 4.0

Merchandise Inventory is a current asset account that houses all purchase costs associated with the transaction. This includes the cost of the merchandise, shipping charges, insurance fees, taxes, and any other costs that gets the

products ready for sale. Gross purchases are defined as the original amount of the purchase without considering reductions for purchase discounts, returns, or allowances. Once the purchase reductions are adjusted at the end of a period, net purchases are calculated. Net purchases (see Figure 2.7) equals gross purchases less purchase discounts, purchase returns, and purchase allowances.

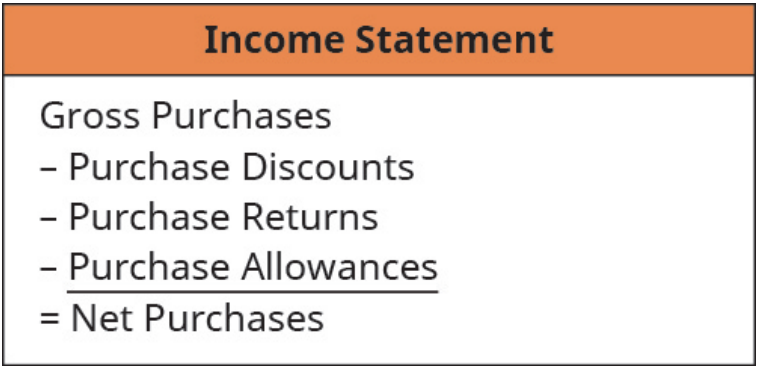


Figure 2.7 Purchase Transactions' Effect on Gross Purchases *Deducting purchase discounts, returns, and allowances from gross purchases will result in net purchases. Purchase Transactions' Effect on Gross Purchases. By: Rice University Source: Openstax CC BY NC-SA 4.0*

Purchase Discounts

If a retailer, pays on credit, they will work out payment terms with the manufacturer. These payment terms establish the purchase cost, an invoice date, any discounts, shipping charges, and the final payment due date.

Purchase discounts provide an incentive for the retailer to pay early on their accounts by offering a reduced rate on the final purchase cost. Receiving payment in a timely manner allows the manufacturer to free up cash for other business opportunities and decreases the risk of nonpayment.

To describe the discount terms, the manufacturer can write descriptions such as 2/10, n/30 on the invoice. The "2" represents a discount rate of 2%, the "10" represents the discount period in days, and the "n/30" means "net of 30" days, representing the entire payment period without a discount application. So, "2/10, n/30" reads as, "The company will receive a 2% discount on their purchase if they pay in 10 days. Otherwise, they have 30 days from the date of the sale to pay in full, no discount received." In some cases, if the retailer exceeds the full payment period (30 days in this example), the manufacturer may charge interest as a penalty for late payment. The number of days allowed for both the discount period and the full payment period begins counting from the invoice date.

If a merchandiser pays an invoice within the discount period, they receive a discount, which affects the cost of the inventory. Let's say a retailer pays within the discount window. They would need to show a credit to the Merchandise Inventory account, recognizing the decreased final cost of the merchandise. This aligns with the cost principle, which requires a company to record an asset's value at the cost of acquisition. In addition, since cash is used to pay the manufacturer, Cash is credited. The debit to Accounts Payable does not reflect the discount taken: it reflects fulfillment of the liability in full, and the credits to Merchandise Inventory and Cash reflect the discount taken, as demonstrated in the following example.

If the retailer does not pay within the discount window, they do not receive a discount but are still required to pay the full invoice price at the end of the term. In this case, Accounts Payable is debited and Cash is credited, but no reductions are made to Merchandise Inventory.

For example, suppose a kitchen appliances retailer purchases merchandise for their store from a manufacturer on September 1 in the amount of $1,600. Credit terms are 2/10, n/30 from the invoice date of September 1. The retailer makes

payment on September 5 and receives the discount. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Sept. 5	Accounts Payable	1,600	
	Cash		1,568
	Merchandise Inventory		32
	To recognize purchase payment with discount taken		

Figure 2.8 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Let's consider the same situation except the retailer did not make the discount window and paid in full on September 30. The entry would recognize the following instead.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Accounts Payable	1,600	
	Cash		1,600
	To recognize purchase payment without discount applied		

Figure 2.9 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

There are two kinds of purchase discounts, cash discounts and trade discounts. Cash discount provides a discount on the final price after purchase if a retailer pays within a discount window. On the other hand, a trade discount is a reduction to the advertised manufacturer's price that occurs during negotiations of a final purchase price before the inventory is purchased. The trade discount may become larger if the retailer purchases more in one transaction. While the cash discount is recognized in journal entries, a trade discount is not, since it is negotiated before purchase.

For example, assume that a retailer is considering an order for $4,000 in inventory on September 1. The manufacturer

offers the retailer a 15% discount on the price if they place the order by September 5. Assume that the retailer places the $4,000 order on September 3. The purchase price would be $4,000 less the 15% discount of $600, or $3,400. Since the trade discount is based on when the order was placed and not on any potential payment discounts, the initial journal entry to record the purchase would reflect the discounted amount of $3,400. Even if the retailer receives a trade discount, they may still be eligible for an additional purchase discount if they pay within the discount window of the invoice.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Merchandise Inventory	3,400	
	Accounts Payable		3,400
	To record purchase on credit		

Figure 2.10 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Purchase Returns and Allowances

If a retailer is unhappy with their purchase—for example, if the order is incorrect or if the products are damaged—they may receive a partial or full refund from the manufacturer in a purchase returns and allowances transaction. A purchase return occurs when merchandise is returned and a full refund is issued. A purchase allowance occurs when merchandise is kept and a partial refund is issued. In either case, a manufacturer will issue a debit memo to acknowledge the change in contract terms and the reduction in the amount owed.

To recognize a return or allowance, the retailer will reduce Accounts Payable (or increase Cash) and reduce Merchandise Inventory. Accounts Payable decreases if the retailer has yet to pay on their account, and Cash increases if they had already paid and received a subsequent refund. Merchandise Inventory

decreases to show the reduction of inventory cost from the retailer's inventory stock. Note that if a retailer receives a refund before they make a payment, any discount taken must be from the new cost of the merchandise less the refund.

To illustrate, assume that Carter Candle Company received a shipment from a manufacturer that had 150 candles that cost $150. Assume that they have not yet paid for these candles and 100 of the candles are badly damaged and must be returned. The other 50 candles are marketable, but are not the right style. The candle company returned the 100 defective candles for a full refund and requested and received an allowance of $20 for the 50 improper candles they kept. The first entry shows the return and the second entry shows the allowance.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Accounts Payable	100	
	Merchandise Inventory		100
	To recognize purchase return for full refund		
	Accounts Payable	20	
	Merchandise Inventory		20
	To recognize purchase allowance with partial refund		

Figure 2.11 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

It is possible to show these entries as one, since they affect the same accounts and were requested at the same time. From a manager's standpoint, though, it may be better to record these as separate transactions to better understand the specific reasons for the reduction to inventory (either return or allowance) and restocking needs.

Characteristics of Sales Transactions

Business owners may encounter several sales situations that can help meet customer needs and control inventory

operations. For example, some customers will expect the opportunity to buy using short-term credit and often will assume that they will receive a discount for paying within a brief period. The mechanics of sales discounts are demonstrated later in this section.

Sales with Cash or on Credit

As previously mentioned, a sale is usually considered a transaction between a merchandiser or retailer and a customer. When a sale occurs, a customer has the option to pay with cash or credit. For our purposes, let's consider "credit" as credit extended from the business directly to the customer.

Whether or not a customer pays with cash or credit, a business must record two accounting entries. One entry recognizes the sale and the other recognizes the cost of the sale. The sales entry consists of a debit to either Cash or Accounts Receivable (if paying on credit), and a credit to the revenue account, Sales.

The amount recorded in the Sales account is the gross amount. Gross sales is the original amount of the sale without factoring in any possible reductions for discounts, returns, or allowances. Once those reductions are recorded at the end of a period, net sales are calculated. Net sales (see Figure 2.12) equals gross sales less sales discounts, sales returns, and sales allowances. Recording the sale as it occurs allows the company to align with the revenue recognition principle. The revenue recognition principle requires companies to record revenue when it is earned, and revenue is earned when a product or service has been provided.

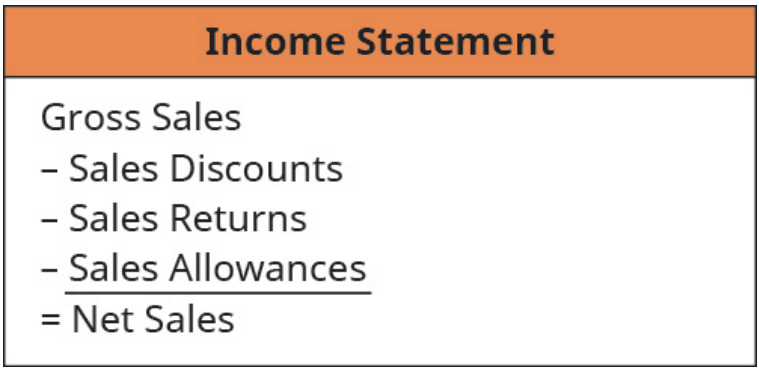


Figure 2.12 Sales Transactions' Effect on Gross Sales *Deducting sales discounts, returns, and allowances from gross sales, will result in net sales. Sales Transactions' Effect on Gross Sales. By: Rice University Source: Openstax CC BY NC-SA 4.0*

The second accounting entry that is made during a sale describes the cost of sales. The cost of sales entry includes decreasing Merchandise Inventory and increasing Cost of Goods Sold (COGS). The decrease to Merchandise Inventory reflects the reduction in the inventory account value due to the sold merchandise. The increase to COGS represents the expense associated with the sale. The cost of goods sold (COGS) is an expense account that houses all costs associated with getting the product ready for sale. This could include purchase costs, shipping, taxes, insurance, stocking fees, and overhead related to preparing the product for sale. By recording the cost of sale when the sale occurs, the company aligns with the matching principle. The matching principle requires companies to match revenues generated with related expenses in the period in which they are incurred.

For example, when a shoe store sells 150 pairs of athletic cleats to a local baseball league for $1,500 (cost of $900), the league may pay with cash or credit. If the baseball league elects to pay with cash, the shoe store would debit Cash as part of

the sales entry. If the baseball league decides to use a line of credit extended by the shoe store, the shoe store would debit Accounts Receivable as part of the sales entry instead of Cash. With the sales entry, the shoe store must also recognize the $900 cost of the shoes sold and the $900 reduction in Merchandise Inventory.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cash	1,500	
	Sales		1,500
	To recognize cash sale		
	Cost of Goods Sold	900	
	Merchandise Inventory		900
	To recognize the cost of sale		

Figure 2.13
By: Rice University
Source: Openstax
CC BY NC-SA 4.0

You may have noticed that sales tax has not been discussed as part of the sales entry. Sales taxes are liabilities that require a portion of every sales dollar be remitted to a government entity. This would reduce the amount of cash the company keeps after the sale. Sales tax is relevant to consumer sales and is discussed later in the course.

There are a few transactional situations that may occur after a sale is made that have an effect on reported sales at the end of a period.

Sales Discounts

Sales discounts are incentives given to customers to entice them to pay off their accounts early. Why would a retailer offer this? Wouldn't they rather receive the entire amount owed? The discount serves several purposes that are similar to the rationale manufacturers consider when offering discounts to retailers. It can help solidify a long-term relationship with the customer, encourage the customer to purchase more, and

decreases the time it takes for the company to see a liquid asset (cash). Cash can be used for other purposes immediately such as reinvesting in the business, paying down loans quicker, and distributing dividends to shareholders. This can help grow the business at a more rapid rate.

Similar to credit terms between a retailer and a manufacturer, a customer could see credit terms offered by the retailer in the form of 2/10, n/30. This particular example shows that if a customer pays their account within 10 days, they will receive a 2% discount. Otherwise, they have 30 days to pay in full but do not receive a discount. If the customer does not pay within the discount window, but pays within 30 days, the retailing company records a credit to Accounts Receivable, and a debit to Cash for the full amount stated on the invoice. If the customer is able to pay the account within the discount window, the company records a credit to Accounts Receivable, a debit to Cash, and a debit to Sales Discounts.

The sales discounts account is a contra revenue account that is deducted from gross sales at the end of a period in the calculation of net sales. Sales Discounts has a normal debit balance, which offsets Sales that has a normal credit balance.

Let's assume that a customer purchased 10 emergency kits from a retailer at $100 per kit on credit. The retailer offered the customer 2/10, n/30 terms, and the customer paid within the discount window. The retailer recorded the following entry for the initial sale.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Accounts Receivable	1,000	
	Sales		1,000
	To reflect the sale on credit		

Figure 2.14 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Since the retailer doesn't know at the point of sale whether or not the customer will qualify for the sales discount, the entire account receivable of $1,000 is recorded on the retailer's journal.

Also assume that the retailer's costs of goods sold in this example were $560 and we are using the perpetual inventory method. The journal entry to record the sale of the inventory follows the entry for the sale to the customer.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cost of Goods Sold	560	
	Merchandise inventory		560
	To reflect the sale of inventory		

Figure 2.15
By: Rice University
Source: Openstax
CC BY NC-SA 4.0

Since the customer paid the account in full within the discount qualification period of ten days, the following journal entry on the retailer's books reflects the payment.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cash	980	
	Sales Discounts	20	
	Accounts Receivable		1,000
	To recognize a sales discount and collection of receivable ($1,000 × 2%)		

Figure 2.16
By: Rice University
Source: Openstax
CC BY NC-SA 4.0

Now, assume that the customer paid the retailer within the 30-day period but did not qualify for the discount. The following entry reflects the payment without the discount.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cash	1,000	
	Accounts Receivable		1,000
	To reflect the collection of accounts receivable		

Figure 2.17 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Please note that the entire $1,000 account receivable created is eliminated under both payment options. When the discount is missed, the retail received the entire $1,000. However, when the discount was received by the customer, the retailer received $980, and the remaining $20 is recorded in the sales discount account.

Sales Returns and Allowances

If a customer purchases merchandise and is dissatisfied with their purchase, they may receive a refund or a partial refund, depending on the situation. When the customer returns merchandise and receives a full refund, it is considered a sales return. When the customer keeps the defective merchandise and is given a partial refund, it is considered a sales allowance. The biggest difference is that a customer returns merchandise in a sales return and keeps the merchandise in a sales allowance.

When a customer returns the merchandise, a retailer issues a credit memo to acknowledge the change in contract and reduction to Accounts Receivable, if applicable. The retailer records an entry acknowledging the return by reducing either Cash or Accounts Receivable and increasing Sales Returns and Allowances. Cash would decrease if the customer had already paid for the merchandise and cash was thus refunded to the

customer. Accounts Receivable would decrease if the customer had not yet paid on their account. Like Sales Discounts, the sales returns and allowances account is a contra revenue account with a normal debit balance that reduces the gross sales figure at the end of the period.

Beyond recording the return, the retailer must also determine if the returned merchandise is in "sellable condition." An item is in sellable condition if the merchandise is good enough to warrant a sale to another customer in the future. If so, the company would record a decrease to Cost of Goods Sold (COGS) and an increase to Merchandise Inventory to return the merchandise back to the inventory for resale. This is recorded at the merchandise's costs of goods sold value. If the merchandise is in sellable condition but will not realize the original cost of the good, the company must estimate the loss at this time.

On the other hand, when the merchandise is returned and is not in sellable condition, the retailer must estimate the value of the merchandise in its current condition and record a loss. This would increase Merchandise Inventory for the assessed value of the merchandise in its current state, decrease COGS for the original expense amount associated with the sale, and increase Loss on Defective Merchandise for the unsellable merchandise lost value.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Merchandise Inventory Loss on Defective Merchandise Cost of Goods Sold *To account for merchandise in unsellable condition*	$$$ $$$	 $$$

, and a credit to Cost of Goods Sold for $$, with the note "to account for merchandise in unsellable condition."" width="1299" height="246" data-media-type="image/jpeg" /> **Figure 2.18** By: Rice University Source: Openstax CC BY NC-SA 4.0

Let's say a customer purchases 300 plants on credit from a nursery for $3,000 (with a cost of $1,200). The first entry reflects the initial sale by the nursery. The second entry reflects the cost of goods sold.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Accounts receivable	3,000	
	Sales		3,000
	To recognize the sale of 300 plants		
	Cost of goods sold	1,200	
	Merchandise inventory		1,200
	To reflect the cost of goods sold for sale of 300 plants		

Figure 2.19
By: Rice University
Source: Openstax
CC BY NC-SA 4.0

Upon receipt, the customer discovers the plants have been infested with bugs and they send all the plants back. Assuming that the customer had not yet paid the nursery any of the $3,000 accounts receivable and assuming that the nursery determines the condition of the returned plants to be sellable, the retailer would record the following entries.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Sales Returns and Allowances	3,000	
	Accounts Receivable		3,000
	To recognize a sales return		
	Merchandise Inventory	1,200	
	Cost of Goods Sold		1,200
	To return inventory to stock for resale		

Figure 2.20
By: Rice University
Source: Openstax
CC BY NC-SA 4.0

For another example, let's say the plant customer was only dissatisfied with 100 of the plants. After speaking with the nursery, the customer decides to keep 200 of the plants for a partial refund of $1,000. The nursery would record the following entry for sales allowance associated with 100 plants.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Sales Returns and Allowances	1,000	
	Accounts Receivable		1,000
	To record a sales allowance for 100 plants		

Figure 2.21
By: Rice University
Source: Openstax
CC BY NC-SA 4.0

The nursery would also record a corresponding entry for the inventory and the cost of goods sold for the 100 returned plants.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Merchandise Inventory	400	
	Cost of Goods Sold		400
	To reflect the return of 100 plants		

Figure 2.22
By: Rice University
Source: Openstax
CC BY NC-SA 4.0

For both the return and the allowance, if the customer had already paid their account in full, Cash would be affected rather than Accounts Receivable.

There are differing opinions as to whether sales returns and allowances should be in separate accounts. Separating the accounts would help a retailer distinguish between items that are returned and those that the customer kept. This can better identify quality control issues, track whether a customer was satisfied with their purchase, and report how many resources are spent on processing returns. Most companies choose to combine returns and allowances into one account, but from a manager's perspective, it may be easier to have the accounts separated to make current determinations about inventory.

You may have noticed our discussion of credit sales did not

include third-party credit card transactions. This is when a customer pays with a credit or debit card from a third-party, such as **Visa**, **MasterCard**, **Discover**, or **American Express**. These entries and discussion are covered in more advanced accounting courses.

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2.2 Perpetual v. Periodic Inventory Systems

There are two ways in which a company may account for their inventory. They can use a perpetual or periodic inventory system. Let's look at the characteristics of these two systems.

Characteristics of the Perpetual and Periodic Inventory Systems

A perpetual inventory system automatically updates and records the inventory account every time a sale, or purchase of inventory, occurs. You can consider this "recording as you go." The recognition of each sale or purchase happens immediately upon sale or purchase.

A periodic inventory system updates and records the inventory account at certain, scheduled times at the end of an operating cycle. The update and recognition could occur at the end of the month, quarter, and year. There is a gap between the sale or purchase of inventory and when the inventory activity is recognized.

Generally Accepted Accounting Principles (GAAP) do not state a required inventory system, but the periodic inventory system uses a Purchases account to meet the requirements for recognition under GAAP. IFRS requirements are very similar. The main difference is that assets are valued at net realizable value and can be increased or decreased as values change.

Under GAAP, once values are reduced they cannot be increased again.



Figure 2.22 Inventory Systems *By: Marcin Wichary Source: Flickr CC BY 2.0*

Inventory Systems Comparison

There are some key differences between perpetual and periodic inventory systems. When a company uses the perpetual inventory system and makes a purchase, they will automatically update the Merchandise Inventory account. Under a periodic inventory system, Purchases will be updated, while Merchandise Inventory will remain unchanged until the company counts and verifies its inventory balance. This count and verification typically occur at the end of the annual accounting period, which is often on December 31 of the year. The Merchandise Inventory account balance is reported on the balance sheet while the Purchases account is reported on the Income Statement when using the periodic inventory method.

The Cost of Goods Sold is reported on the Income Statement under the perpetual inventory method.



JOURNAL			
Date	**Account**	**Debit**	**Credit**
Perpetual			
	Merchandise Inventory	$$$	
	Accounts Payable		$$$
Periodic			
	Purchases	$$$	
	Accounts Payable		$$$

$ under the heading of “Perpetual,” followed by a debit to Purchases for

$$\$ and credit to Accounts Payable for$$

$ under the heading of “Periodic.”” width=”1299" height=”391" data-media-type=”image/jpeg” /> **Figure 2.23** By: Rice University Source: Openstax CC BY SA 2.0

A purchase return or allowance under perpetual inventory systems updates Merchandise Inventory for any decreased cost. Under periodic inventory systems, a temporary account, Purchase Returns and Allowances, is updated. Purchase Returns and Allowances is a contra account and is used to reduce Purchases.



JOURNAL			
Date	**Account**	**Debit**	**Credit**
Perpetual			
	Accounts Payable	$$$	
	Merchandise Inventory		$$$
Periodic			
	Accounts Payable	$$$	
	Purchase Returns and Allowances		$$$

$ under the heading of “Perpetual,” followed by a debit to Accounts Payable for

$and credit to Purchase Returns and Allowances for

$ under the heading of “Periodic.”” width=”1299" height=”392" data-media-type=”image/jpeg” /> **Figure 2.24** By: Rice University Source: Openstax CC BY SA 2.0

When a purchase discount is applied under a perpetual inventory system, Merchandise Inventory decreases for the discount amount. Under a periodic inventory system, Purchase Discounts (a temporary, contra account), increases for the discount amount and Merchandise Inventory remains unchanged.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Perpetual			
	Accounts Payable	$$$	
	Cash		$$$
	Merchandise Inventory		$$$
Periodic			
	Accounts Payable	$$$	
	Cash		$$$
	Purchase Discounts		$$$

$ under the heading of “Perpetual,” followed by a debit to Accounts Payable for

$and credits to Cash and Purchase Discounts, each for

$ under the heading of “Periodic.”” width=”1299" height=”423" data-media-type=”image/jpeg” /> **Figure 2.25** By: Rice University Source: Openstax CC BY SA 2.0

When a sale occurs under perpetual inventory systems, two entries are required: one to recognize the sale, and the other to recognize the cost of sale. For the cost of sale, Merchandise Inventory and Cost of Goods Sold are updated. Under periodic inventory systems, this cost of sale entry does not exist. The

recognition of merchandise cost only occurs at the end of the period when adjustments are made and temporary accounts are closed.



JOURNAL			
Date	**Account**	**Debit**	**Credit**
Perpetual			
	Accounts Receivable	$$$	
	Sales		$$$
	Cost of Goods Sold	$$$	
	Merchandise Inventory		$$$
Periodic			
	Accounts Receivable	$$$	
	Sales		$$$

$andcredittoSales for

$, and then a credit to Cost of Goods Sold for

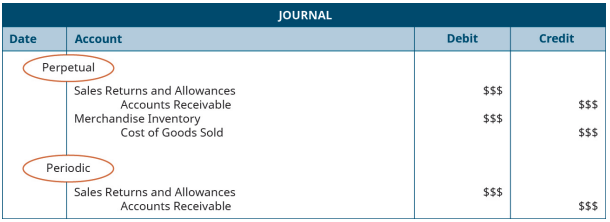
$$\$andcredittoMerchandiseInventoryfor$$

$ under the heading of “Perpetual,” followed by a debit to Accounts Receivable for

$$\$andcredittoSalesfor$$

$ under the heading of “Periodic.”” width=”1299" height=”465" data-media-type=”image/jpeg” /> **Figure 2.26** By: Rice University Source: Openstax CC BY SA 2.0

When a sales return occurs, perpetual inventory systems require recognition of the inventory’s condition. This means a decrease to COGS and an increase to Merchandise Inventory. Under periodic inventory systems, only the sales return is recognized, but not the inventory condition entry.



$, and then a credit to Merchandise Inventory for

$$\$ and credit to Cost of Goods Sold for$$

$ under the heading of “Perpetual,” followed by a debit to Sales Returns and Allowances for

$$\$ and credit to Accounts Receivable for$$

$ under the heading of “Periodic.”” width=”1299" height=”464" data-media-type=”image/jpeg” /> **Figure 2.27** By: Rice University Source: Openstax CC BY SA 2.0

A sales allowance and sales discount follow the same recording formats for either perpetual or periodic inventory systems.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Perpetual and Periodic			
	Sales Returns and Allowances	$$$	
	Accounts Receivable		$$$
	Cash	$$$	
	Sales Discount	$$$	
	Accounts Receivable		$$$

$, credit to Accounts Receivable for

$, debits to Cash and Sales Discounts, each for

$, under credit to Accounts Receivable for

$, all under the heading of "Perpetual and Periodic."" width="1299" height="391" data-media-type="image/jpeg" /> ***Figure 2.28*** *By: Rice University Source: Openstax CC BY SA 2.0*

Adjusting and Closing Entries for a Perpetual Inventory System

You have already explored adjusting entries and the closing process in prior discussions, but merchandising activities require additional adjusting and closing entries to inventory, sales discounts, returns, and allowances. Here, we'll briefly discuss these additional closing entries and adjustments as they relate to the perpetual inventory system.

At the end of the period, a perpetual inventory system will have the Merchandise Inventory account up-to-date; the only

thing left to do is to compare a physical count of inventory to what is on the books. A physical inventory count requires companies to do a manual "stock-check" of inventory to make sure what they have recorded on the books matches what they physically have in stock. Differences could occur due to mismanagement, shrinkage, damage, or outdated merchandise. Shrinkage is a term used when inventory or other assets disappear without an identifiable reason, such as theft. For a perpetual inventory system, the adjusting entry to show this difference follows. This example assumes that the merchandise inventory is overstated in the accounting records and needs to be adjusted downward to reflect the actual value on hand.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cost of Goods Sold Merchandise Inventory *To adjust merchandise inventory of books*	$$$	$$$

$undercreditsMerchandiseInventoryfor

$ with the note "to adjust Merchandise Inventory on books."" width="1299" height="217" data-media-type="image/jpeg" />
Figure 2.29
By: Rice University
Source: Openstax
CC BY SA 2.0

If a physical count determines that merchandise inventory is understated in the accounting records, Merchandise Inventory would need to be increased with a debit entry and the COGS would be reduced with a credit entry. The adjusting entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Merchandise Inventory Cost of Goods Sold *To adjust merchandise inventory of books*	$$$	$$$

$anderdittoCostofGoodsSoldfor

$ with the note "to adjust Merchandise Inventory of books."" width="1299" height="217" data-media-type="image/jpeg" /> ***Figure 2.30*** *By: Rice University Source: Openstax CC BY SA 2.0*

To sum up the potential adjustment process, after the merchandise inventory has been verified with a physical count, its book value is adjusted upward or downward to reflect the actual inventory on hand, with an accompanying adjustment to the COGS.

Not only must an adjustment to Merchandise Inventory occur at the end of a period, but closure of temporary merchandising accounts to prepare them for the next period is required. Temporary accounts requiring closure are Sales, Sales Discounts, Sales Returns and Allowances, and Cost of Goods Sold. Sales will close with the temporary credit balance accounts to Income Summary.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Sales Income Summary	$$$	 $$$

$and credit to Income Summary for $." width="1299" height="187" data-media-type="image/jpeg" />
Figure 2.31 *By: Rice University Source: Openstax CC BY SA 2.0*

Sales Discounts, Sales Returns and Allowances, and Cost of Goods Sold will close with the temporary debit balance accounts to Income Summary.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Income Summary Sales Discounts Sales Returns and Allowances Cost of Goods Sold	$$$	 $$$ $$$ $$$

[illegible] $." width="1299" height="246" data-media-type="image/jpeg" />
Figure 2.32 *By: Rice University Source: Openstax CC BY SA 2.0*

Note that for a periodic inventory system, the end of the period adjustments require an update to COGS. To determine the value of Cost of Goods Sold, the business will have to look at the

beginning inventory balance, purchases, purchase returns and allowances, discounts, and the ending inventory balance.

The formula to compute COGS is:

$$\text{Cost of Goods Sold} = \text{Beginning Inventory} + \text{Net Purchases} - \text{Ending Inventory}$$

where:

$$\text{Net Purchases} = \text{(Gross) Purchases} - \text{Purchase Discounts} - \text{Purchase Returns and Allowances}$$

Once the COGS balance has been established, an adjustment is made to Merchandise Inventory and COGS, and COGS is closed to prepare for the next period.

Table 2.1 summarizes the differences between the perpetual and periodic inventory systems.

Table 2.1 Perpetual and Periodic Transaction Comparison: There are several differences in account recognition between the perpetual and periodic inventory systems. By: Rice University Openstax CC BY NC SA 4.0

Transaction	Perpetual Inventory System	Periodic Inventory System
Purchase of Inventory	Record cost to Inventory account	Record cost to Purchases account
Purchase Return or Allowance	Record to update Inventory	Record to Purchase Returns and Allowances
Purchase Discount	Record to update Inventory	Record to Purchase Discounts
Sale of Merchandise	Record two entries: one for sale and one for cost of sale	Record one entry for the sale
Sales Return	Record two entries: one for sales return, one for cost of inventory returned	Record one entry: sales return, cost not recognized
Sales Allowance	Same under both systems	Same under both systems
Sales Discount	Same under both systems	Same under both systems

There are advantages and disadvantages to both the perpetual and periodic inventory systems.

CONCEPTS IN PRACTICE

Point-of-Sale Systems

Advancements in point-of-sale (POS) systems have simplified the once tedious task of inventory management. POS systems connect with inventory management programs to make real-time data available to help streamline business operations. The cost of inventory management decreases with this connection

tool, allowing all businesses to stay current with technology without "breaking the bank."

One such POS system is Square. Square accepts many payment types and updates accounting records every time a sale occurs through a cloud-based application. **Square, Inc.** has expanded their product offerings to include Square for Retail POS. This enhanced product allows businesses to connect sales and inventory costs immediately. A business can easily create purchase orders, develop reports for cost of goods sold, manage inventory stock, and update discounts, returns, and allowances. With this application, customers have payment flexibility, and businesses can make present decisions to positively affect growth.

Advantages and Disadvantages of the Perpetual Inventory System

The perpetual inventory system gives real-time updates and keeps a constant flow of inventory information available for decision-makers. With advancements in point-of-sale technologies, inventory is updated automatically and transferred into the company's accounting system. This allows managers to make decisions as it relates to inventory purchases, stocking, and sales. The information can be more robust, with exact purchase costs, sales prices, and dates known. Although a periodic physical count of inventory is still required, a perpetual inventory system may reduce the number of times physical counts are needed.

The biggest disadvantages of using the perpetual inventory systems arise from the resource constraints for cost and time. It is costly to keep an automatic inventory system up-to-date. This may prohibit smaller or less established companies from investing in the required technologies. The time commitment

to train and retrain staff to update inventory is considerable. In addition, since there are fewer physical counts of inventory, the figures recorded in the system may be drastically different from inventory levels in the actual warehouse. A company may not have correct inventory stock and could make financial decisions based on incorrect data.

Advantages and Disadvantages of the Periodic Inventory System

The periodic inventory system is often less expensive and time consuming than perpetual inventory systems. This is because there is no constant maintenance of inventory records or training and retraining of employees to upkeep the system. The complexity of the system makes it difficult to identify the cost justification associated with the inventory function.

While both the periodic and perpetual inventory systems require a physical count of inventory, periodic inventorying requires more physical counts to be conducted. This updates the inventory account more frequently to record exact costs. Knowing the exact costs earlier in an accounting cycle can help a company stay on budget and control costs.

However, the need for frequent physical counts of inventory can suspend business operations each time this is done. There are more chances for shrinkage, damaged, or obsolete merchandise because inventory is not constantly monitored. Since there is no constant monitoring, it may be more difficult to make in-the-moment business decisions about inventory needs.

While each inventory system has its own advantages and disadvantages, the more popular system is the perpetual inventory system. The ability to have real-time data to make decisions, the constant update to inventory, and the

integration to point-of-sale systems, outweigh the cost and time investments needed to maintain the system.

2.3 Purchases of Merchandise- Perpetual System

The following example transactions and subsequent journal entries for merchandise purchases are recognized using a perpetual inventory system. The periodic inventory system recognition of these example transactions and corresponding journal entries will be studied in more advanced accounting courses.

Basic Analysis of Purchase Transaction Journal Entries

To better illustrate merchandising activities, let's follow California Business Solutions (CBS), a retailer providing electronic hardware packages to meet small business needs. Each electronics hardware package (see Figure 2.33) contains a desktop computer, tablet computer, landline telephone, and a 4-in-1 desktop printer with a printer, copier, scanner, and fax machine.

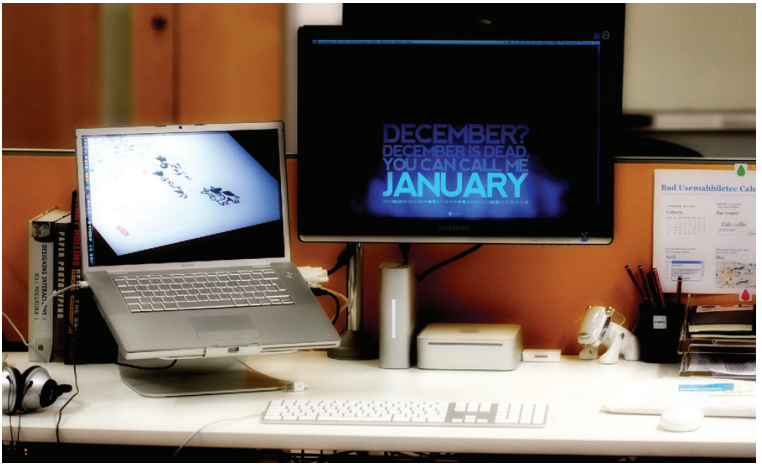


Figure 2.33 Modification of Professional Desk *California Business Solutions. Providing businesses electronic hardware solutions. Modification of Professional Desk. By: reynermedia. Source: Flickr CC BY 2.0*

CBS purchases each electronic product from a manufacturer. The following are the per-item purchase prices from the manufacturer.

Product	Price per Unit
Desktop computer	$400
Tablet computer	60
Landline telephone	60
4-in-1 desktop printer	100

Figure 2.34 *By: Rice University Source: Openstax CC BY 2.0*

Cash and Credit Purchase Transaction Journal Entries

On April 1, CBS purchases 10 electronic hardware packages at a cost of $620 each. CBS has enough cash-on-hand to pay immediately with cash. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 1	Merchandise Inventory: Packages	6,200	
	Cash		6,200
	To recognize purchase of 10 packages		

Figure 2.35 *By: Rice University Source: Openstax CC BY 2.0*

Merchandise Inventory-Packages increases (debit) for 6,200 ($620 × 10), and Cash decreases (credit) because the company paid with cash. It is important to distinguish each inventory item type to better track inventory needs.

On April 7, CBS purchases 30 desktop computers on credit at a cost of $400 each. The credit terms are n/15 with an invoice date of April 7. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 7	Merchandise Inventory: Desktop Computers	12,000	
	Accounts Payable		12,000
	To recognize purchase of 30 computers on credit, n/15		

Figure 2.36 *By: Rice University Source: Openstax CC BY 2.0*

Merchandise Inventory is specific to desktop computers and is increased (debited) for the value of the computers by $12,000 ($400 × 30). Since the computers were purchased on credit by CBS, Accounts Payable increases (credit).

On April 17, CBS makes full payment on the amount due from the April 7 purchase. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 17	Accounts Payable Cash *To recognize payment in full*	12,000	12,000

Figure 2.37 *By: Rice University Source: Openstax CC BY 2.0*

Accounts Payable decreases (debit), and Cash decreases (credit) for the full amount owed. The credit terms were n/15, which is net due in 15 days. No discount was offered with this transaction. Thus the full payment of $12,000 occurs.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=179#oembed-1

Purchase Discount Transaction Journal Entries

On May 1, CBS purchases 67 tablet computers at a cost of $60 each on credit. The payment terms are 5/10, n/30, and the invoice is dated May 1. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
May 1	Merchandise Inventory: Tablet Computers Accounts Payable *To recognize purchase of 67 tablets, 5/10, n/30*	4,020	4,020

Figure 2.38 *By: Rice University Source: Openstax CC BY 2.0*

Merchandise Inventory-Tablet Computers increases (debit) in the amount of $4,020 (67 × $60). Accounts Payable also increases (credit) but the credit terms are a little different than the previous example. These credit terms include a discount opportunity (5/10), meaning, CBS has 10 days from the invoice date to pay on their account to receive a 5% discount on their purchase.

On May 10, CBS pays their account in full. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
May 10	Accounts Payable	4,020	
	Merchandise Inventory: Tablet Computers		201
	Cash		3,819
	To recognize payment, less purchase discount		

Figure 2.39 *By: Rice University Source: Openstax CC BY 2.0*

Accounts Payable decreases (debit) for the original amount owed of $4,020 before any discounts are taken. Since CBS paid on May 10, they made the 10-day window and thus received a discount of 5%. Cash decreases (credit) for the amount owed, less the discount. Merchandise Inventory-Tablet Computers decreases (credit) for the amount of the discount ($4,020 × 5%). Merchandise Inventory decreases to align with the Cost Principle, reporting the value of the merchandise at the reduced cost.

Let's take the same example purchase with the same credit terms, but now CBS paid their account on May 25. The following entry would occur instead.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
May 25	Accounts Payable	4,020	
	Cash		4,020
	To recognize payment for tablets, no discount		

Figure 2.40 *By: Rice University Source: Openstax CC BY 2.0*

Accounts Payable decreases (debit) and Cash decreases (credit) for $4,020. The company paid on their account outside of the discount window but within the total allotted timeframe for payment. CBS does not receive a discount in this case but does pay in full and on time.

Purchase Returns and Allowances Transaction Journal Entries

On June 1, CBS purchased 300 landline telephones with cash at a cost of $60 each. On June 3, CBS discovers that 25 of the phones are the wrong color and returns the phones to the manufacturer for a full refund. The following entries occur with the purchase and subsequent return.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jun. 1	Merchandise Inventory: Phones	18,000	
	Cash		18,000
	To recognize phone purchase with cash		

Figure 2.41 *By: Rice University Source: Openstax CC BY 2.0*

Both Merchandise Inventory-Phones increases (debit) and Cash decreases (credit) by $18,000 ($60 × 300).

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jun. 3	Cash	1,500	
	Merchandise Inventory: Phones		1,500
	To recognize return of 25 phones, cash refund		

Figure 2.42 *By: Rice University Source: Openstax CC BY 2.0*

Since CBS already paid in full for their purchase, a full cash refund is issued. This increases Cash (debit) and decreases

(credit) Merchandise Inventory-Phones because the merchandise has been returned to the manufacturer or supplier.

On June 8, CBS discovers that 60 more phones from the June 1 purchase are slightly damaged. CBS decides to keep the phones but receives a purchase allowance from the manufacturer of $8 per phone. The following entry occurs for the allowance.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jun. 8	Cash	480	
	Merchandise Inventory: Phones		480
	To recognize allowance for 60 phones		

Figure 2.43 *By: Rice University Source: Openstax CC BY 2.0*

Since CBS already paid in full for their purchase, a cash refund of the allowance is issued in the amount of $480 (60 × $8). This increases Cash (debit) and decreases (credit) Merchandise Inventory-Phones because the merchandise is less valuable than before the damage discovery.

CBS purchases 80 units of the 4-in-1 desktop printers at a cost of $100 each on July 1 on credit. Terms of the purchase are 5/15, n/40, with an invoice date of July 1. On July 6, CBS discovers 15 of the printers are damaged and returns them to the manufacturer for a full refund. The following entries show the purchase and subsequent return.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Merchandise Inventory: Printers	8,000	
	Accounts Payable		8,000
	To recognize printer purchase on credit, 5/15, n/40		

Figure 2.44 *By: Rice University Source: Openstax CC BY 2.0*

Both Merchandise Inventory-Printers increases (debit) and Accounts Payable increases (credit) by $8,000 ($100 × 80).

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 6	Accounts Payable Merchandise Inventory: Printers *To recognize return of 15 printers, AP reduction*	1,500	1,500

Figure 2.45 *By: Rice University Source: Openstax CC BY 2.0*

Both Accounts Payable decreases (debit) and Merchandise Inventory-Printers decreases (credit) by $1,500 (15 × $100). The purchase was on credit and the return occurred before payment, thus decreasing Accounts Payable. Merchandise Inventory decreases due to the return of the merchandise back to the manufacturer.

On July 10, CBS discovers that 4 more printers from the July 1 purchase are slightly damaged but decides to keep them, with the manufacturer issuing an allowance of $30 per printer. The following entry recognizes the allowance.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 10	Accounts Payable Merchandise Inventory: Printers *To recognize allowance for 4 printers, AP reduction*	120	120

Figure 2.46 *By: Rice University Source: Openstax CC BY 2.0*

Both Accounts Payable decreases (debit) and Merchandise Inventory-Printers decreases (credit) by $120 (4 × $30). The purchase was on credit and the allowance occurred before payment, thus decreasing Accounts Payable. Merchandise Inventory decreases due to the loss in value of the merchandise.

On July 15, CBS pays their account in full, less purchase returns and allowances. The following payment entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 15	Accounts Payable	6,380	
	Merchandise Inventory: Printers		319
	Cash		6,061
	To recognize payment, less discount, return and allowance		

Figure 2.47 *By: Rice University Source: Openstax CC BY 2.0*

Accounts Payable decreases (debit) for the amount owed, less the return of $1,500 and the allowance of $120 ($8,000 – $1,500 – $120). Since CBS paid on July 15, they made the 15-day window, thus receiving a discount of 5%. Cash decreases (credit) for the amount owed, less the discount. Merchandise Inventory-Printers decreases (credit) for the amount of the discount ($6,380 × 5%). Merchandise Inventory decreases to align with the Cost Principle, reporting the value of the merchandise at the reduced cost.

Summary of Purchase Transaction Journal Entries

The chart in Figure 2.48 represents the journal entry requirements based on various merchandising purchase transactions using the perpetual inventory system.

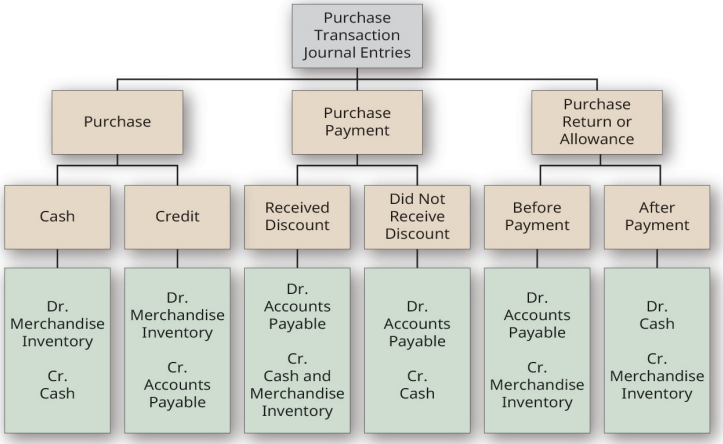


Figure 2.48 Purchase Transaction Journal Entires *Using a Perpetual Inventory System By: Rice University. Source: Openstax CC BY NC-SA 4.0 Long Description*

Note that Figure 2.48 considers an environment in which inventory physical counts and matching books records align. This is not always the case given concerns with shrinkage (theft), damages, or obsolete merchandise. In this circumstance, an adjustment is recorded to inventory to account for the differences between the physical count and the amount represented on the books.

YOUR TURN! For each of the following transactions, click on the correct entry:

An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://psu.pb.unizin.org/acctg211/?p=179#h5p-8

Long Descriptions

Journal entries starting with Purchase Transaction Journal Entries at the top, followed by Purchase, Purchase Payment, and Purchase Return or Allowance on the second tier, then Cash, Credit, Received Discount, Did not Receive Discount, Before Payment, and After Payment on the third tier, and Dr. Merchandise Inventory Cr. Cash; Dr. Merchandise Inventory Cr. Accounts Payable; Dr. Accounts Payable Cr. Cash and Merchandise Inventory; Dr. Accounts Payable Cr. Cash; Dr. Accounts Payable Cr. Merchandise Inventory; and Dr. Cash Cr. Merchandise Inventory on the bottom tier. Return

Journal entry for December 3 shows a debit to Merchandise Inventory for $500 and a credit to Accounts Payable for $500 with the note “to recognize inventory purchase, 2 / 10, n / 30.” December 6 entries show a debit to Accounts Payable for $150 and a credit to Merchandise Inventory for $150 with the note “to recognize inventory return.” December 9 entries show a debit to Accounts Payable for $350, a credit to Merchandise Inventory for $7, and a credit to Cash for $343 with the note “to recognize payment, less discount and return.” Return

2.4 Sales of Merchandise- Perpetual System

The following example transactions and subsequent journal entries for merchandise sales are recognized using a perpetual inventory system. The periodic inventory system recognition of these example transactions and corresponding journal entries will be studied in more advanced courses.

Basic Analysis of Sales Transaction Journal Entries

Let's continue to follow California Business Solutions (CBS) and their sales of electronic hardware packages to business customers. As previously stated, each package contains a desktop computer, tablet computer, landline telephone, and a 4-in-1 printer. CBS sells each hardware package for $1,200. They offer their customers the option of purchasing extra individual hardware items for every electronic hardware package purchase. Figure 2.50 lists the products CBS sells to customers; the prices are per-package, and per unit.

Product	Sales Price per-package, per unit	Cost to CBS per-package, per unit
Electronic hardware package	$1,200	$620
Desktop computer	750	400
Tablet computer	300	60
Landline telephone	150	60
4-in-1 printer	350	100

Figure 2.50 CBSs Product Line *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Cash and Credit Sales Transaction Journal Entries

On July 1, CBS sells 10 electronic hardware packages to a customer at a sales price of $1,200 each. The customer pays immediately with cash. The following entries occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Cash	12,000	
	Sales		12,000
	To recognize sale of 10 packages		
July 1	Cost of Goods Sold	6,200	
	Merchandise Inventory: Packages		6,200
	To recognize cost of sale, 10 packages		

Figure 2.51 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

In the first entry, Cash increases (debit) and Sales increases (credit) for the selling price of the packages, $12,000 ($1,200 × 10). In the second entry, the cost of the sale is recognized. COGS increases (debit) and Merchandise Inventory-Packages decreases (credit) for the cost of the packages, $6,200 ($620 × 10).

On July 7, CBS sells 20 desktop computers to a customer on credit. The credit terms are n ÷ 15 with an invoice date of July 7. The following entries occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 7	Accounts Receivable	15,000	
	Sales		15,000
	To recognize sale of 20 desktop computers, n/15		
July 7	Cost of Goods Sold	8,000	
	Merchandise Inventory: Desktop Computers		8,000
	To recognize cost of sale, 20 desktop computers		

Figure 2.52 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Since the computers were purchased on credit by the customer, Accounts Receivable increases (debit) and Sales

increases (credit) for the selling price of the computers, $15,000 ($750 × 20). In the second entry, Merchandise Inventory-Desktop Computers decreases (credit), and COGS increases (debit) for the cost of the computers, $8,000 ($400 × 20).

On July 17, the customer makes full payment on the amount due from the July 7 sale. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 17	Cash	15,000	
	Accounts Receivable		15,000
	To recognize payment in full		

Figure 2.53 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Accounts Receivable decreases (credit) and Cash increases (debit) for the full amount owed. The credit terms were n ÷ 15, which is net due in 15 days. No discount was offered with this transaction; thus the full payment of $15,000 occurs.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=181#oembed-1

Sales Discount Transaction Journal Entries

On August 1, a customer purchases 56 tablet computers on credit. The payment terms are 2 ÷ 10, n ÷ 30, and the invoice is dated August 1. The following entries occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 1	Accounts Receivable	16,800	
	Sales		16,800
	To recognize sale of 56 tablet computers, 2/10, n/30		
Aug. 1	Cost of Goods Sold	3,360	
	Merchandise Inventory: Tablet Computers		3,360
	To recognize cost of sale, 56 tablet computers		

Figure 2.54 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

In the first entry, both Accounts Receivable (debit) and Sales (credit) increase by $16,800 ($300 × 56). These credit terms are a little different than the earlier example. These credit terms include a discount opportunity (2 ÷ 10), meaning the customer has 10 days from the invoice date to pay on their account to receive a 2% discount on their purchase. In the second entry, COGS increases (debit) and Merchandise Inventory–Tablet Computers decreases (credit) in the amount of $3,360 (56 × $60).

On August 10, the customer pays their account in full. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 10	Cash	16,464	
	Sales Discounts	336	
	Accounts Receivable		16,800
	To recognize payment, less sales discount		

Figure 2.55 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Since the customer paid on August 10, they made the 10-day window and received a discount of 2%. Cash increases (debit) for the amount paid to CBS, less the discount. Sales Discounts increases (debit) for the amount of the discount ($16,800 × 2%), and Accounts Receivable decreases (credit) for the original amount owed, before discount. Sales Discounts will reduce Sales at the end of the period to produce net sales.

Let's take the same example sale with the same credit terms, but now assume the customer paid their account on August 25. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 25	Cash	16,800	
	Accounts Receivable		16,800
	To recognize payment for tablets, no discount		

Figure 2.56 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Cash increases (debit) and Accounts Receivable decreases (credit) by $16,800. The customer paid on their account outside of the discount window but within the total allotted timeframe for payment. The customer does not receive a discount in this case but does pay in full and on time.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=181#oembed-2

YOUR TURN

Recording a Retailer's Sales Transactions

Record the journal entries for the following sales transactions by a retailer.

Table 2.3 Sales Transactions in January By: Rice University OpenStax CC BY-NC-SA 4.0

Date	Transaction
Jan. 5	Sold $2,450 of merchandise on credit (cost of $1,000), with terms 2 ÷ 10, n ÷ 30, and invoice dated January 5.
Jan. 9	The customer returned $500 worth of slightly damaged merchandise to the retailer and received a full refund. The retailer returned the merchandise to its inventory at a cost of $130.
Jan. 14	Account paid in full.

Solution

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 5	Accounts Receivable	2,450	
	Sales		2,450
	To recognize sale on credit, 2/10, n/30		
Jan. 5	Cost of Goods Sold	1,000	
	Merchandise Inventory		1,000
	To recognize cost of sale		
Jan. 9	Sales Returns and Allowances	500	
	Accounts Receivable		500
	To recognize customer return		
Jan. 9	Merchandise Inventory	130	
	Cost of Goods Sold		130
	To recognize merchandise return to inventory		
Jan. 14	Cash	1,911	
	Sales Discounts	39	
	Accounts Receivable		1,950
	To recognize payment, less discount and return		

Figure 2.57 *By: Rice University Source: Openstax CC BY NC-SA 4.0 Long Description*

Sales Returns and Allowances Transaction Journal Entries

On September 1, CBS sold 250 landline telephones to a customer who paid with cash. On September 3, the customer discovers that 40 of the phones are the wrong color and returns the phones to CBS in exchange for a full refund. CBS determines that the returned merchandise can be resold and returns the merchandise to inventory at its original cost. The following entries occur for the sale and subsequent return.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Sept. 1	Cash	37,500	
	Sales		37,500
	To recognize sale of 250 phones with cash		
Sept. 1	Cost of Goods Sold	15,000	
	Merchandise Inventory: Phones		15,000
	To recognize cost of sale, 250 phones		

Figure 2.58 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

In the first entry on September 1, Cash increases (debit) and Sales increases (credit) by $37,500 (250 × $150), the sales price of the phones. In the second entry, COGS increases (debit), and Merchandise Inventory-Phones decreases (credit) by $15,000 (250 × $60), the cost of the sale.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Sept. 3	Sales Returns and Allowances	6,000	
	Cash		6,000
	To recognize return of 40 phones, cash refund		
Sept. 3	Merchandise Inventory: Phones	2,400	
	Cost of Goods Sold		2,400
	To return merchandise to inventory, sellable condition		

Figure 2.59 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Since the customer already paid in full for their purchase, a full cash refund is issued on September 3. This increases Sales Returns and Allowances (debit) and decreases Cash (credit) by $6,000 (40 × $150). The second entry on September 3 returns

the phones back to inventory for CBS because they have determined the merchandise is in sellable condition at its original cost. Merchandise Inventory–Phones increases (debit) and COGS decreases (credit) by $2,400 (40 × $60).

On September 8, the customer discovers that 20 more phones from the September 1 purchase are slightly damaged. The customer decides to keep the phones but receives a sales allowance from CBS of $10 per phone. The following entry occurs for the allowance.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Sept. 8	Sales Returns and Allowances	200	
	Cash		200
	To recognize allowance for 20 phones		

Figure 2.60 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Since the customer already paid in full for their purchase, a cash refund of the allowance is issued in the amount of $200 (20 × $10). This increases (debit) Sales Returns and Allowances and decreases (credit) Cash. CBS does not have to consider the condition of the merchandise or return it to their inventory because the customer keeps the merchandise.

A customer purchases 55 units of the 4-in-1 desktop printers on October 1 on credit. Terms of the sale are 10 ÷ 15, n ÷ 40, with an invoice date of October 1. On October 6, the customer returned 10 of the printers to CBS for a full refund. CBS returns the printers to their inventory at the original cost. The following entries show the sale and subsequent return.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 1	Accounts Receivable	19,250	
	Sales		19,250
	To recognize sale of 55 printers on credit, 10/15, n/40		
Oct. 1	Cost of Goods Sold	5,500	
	Merchandise Inventory: Printers		5,500
	To recognize cost of sale, 55 printers		

Figure 2.61 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

In the first entry on October 1, Accounts Receivable increases (debit) and Sales increases (credit) by $19,250 (55 × $350), the sales price of the printers. Accounts Receivable is used instead of Cash because the customer purchased on credit. In the second entry, COGS increases (debit) and Merchandise Inventory–Printers decreases (credit) by $5,500 (55 × $100), the cost of the sale.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 6	Sales Returns and Allowances	3,500	
	Accounts Receivable		3,500
	To recognize return of 10 printers		
Oct. 6	Merchandise Inventory: Printers	1,000	
	Cost of Goods Sold		1,000
	To return merchandise to inventory, sellable condition		

Figure 2.62 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

The customer has not yet paid for their purchase as of October 6. Therefore, the return increases Sales Returns and Allowances (debit) and decreases Accounts Receivable (credit) by $3,500 (10 × $350). The second entry on October 6 returns the printers back to inventory for CBS because they have determined the merchandise is in sellable condition at its original cost. Merchandise Inventory–Printers increases (debit) and COGS decreases (credit) by $1,000 (10 × $100).

On October 10, the customer discovers that 5 printers from the October 1 purchase are slightly damaged, but decides to keep them, and CBS issues an allowance of $60 per printer. The following entry recognizes the allowance.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 10	Sales Returns and Allowances	300	
	Accounts Receivable		300
	To recognize allowance for 5 printers		

Figure 2.63 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Sales Returns and Allowances increases (debit) and Accounts Receivable decreases (credit) by $300 (5 × $60). A reduction to Accounts Receivable occurs because the customer has yet to pay their account on October 10. CBS does not have to consider the condition of the merchandise or return it to their inventory because the customer keeps the merchandise.

On October 15, the customer pays their account in full, less sales returns and allowances. The following payment entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 15	Cash Sales Discounts Accounts Receivable *To recognize payment, less sales discount, return and allowance*	13,905 1,545	 15,450

Figure 2.64 *By: Rice University Source: Openstax CC BY NC-SA 4.0*

Accounts Receivable decreases (credit) for the original amount owed, less the return of $3,500 and the allowance of $300 ($19,250 – $3,500 – $300). Since the customer paid on October 15, they made the 15-day window, thus receiving a discount of 10%. Sales Discounts increases (debit) for the discount amount ($15,450 × 10%). Cash increases (debit) for the amount owed to CBS, less the discount.

Summary of Sales Transaction Journal Entries

The chart in Figure 2.65 represents the journal entry requirements based on various merchandising sales transactions.

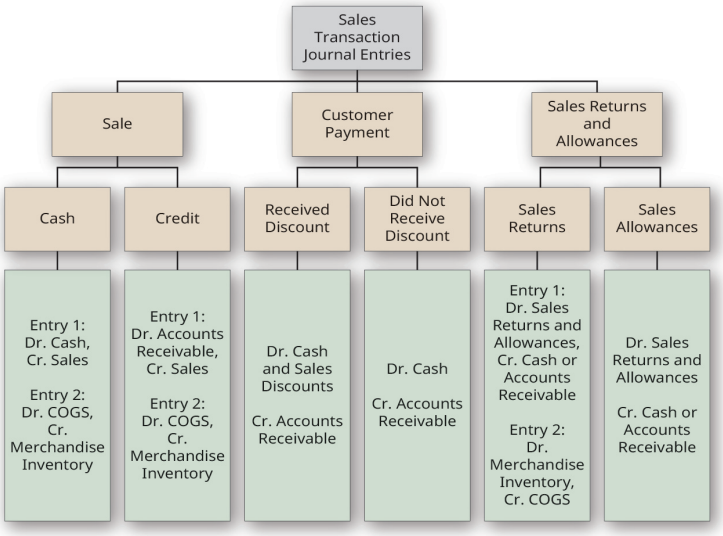


Figure 2.65 Journal Entry Requirements for Merchandise Sales Transaction *By: Rice University Source: Openstax CC BY NC-SA 4.0*

YOUR TURN

Recording a Retailer's Sales Transactions

Record the journal entries for the following sales transactions of a retailer.

Table 2.4 Sales Transactions in May By: Rice University OpenStax CC BY-NC-SA 4.0

Date	Transaction
May 10	Sold $8,600 of merchandise on credit (cost of $2,650), with terms 5 ÷ 10, n ÷ 30, and invoice dated May 10.
May 13	The customer returned $1,250 worth of slightly damaged merchandise to the retailer and received a full refund. The retailer returned the merchandise to its inventory at a cost of $380.
May 15	The customer discovered some merchandise were the wrong color and received an allowance from the retailer of $230.
May 20	The customer paid the account in full, less the return and allowance.

Solution

JOURNAL			
Date	**Account**	**Debit**	**Credit**
May 10	Accounts Receivable	8,600	
	Sales		8,600
	To recognize sale on credit, 5/10, n/30		
May 10	Cost of Goods Sold	2,650	
	Merchandise Inventory		2,650
	To recognize cost of sale		
May 13	Sales Returns and Allowances	1,250	
	Accounts Receivable		1,250
	To recognize customer return		
May 13	Merchandise Inventory	380	
	Cost of Goods Sold		380
	To recognize merchandise return to inventory		
May 15	Sales Returns and Allowances	230	
	Accounts Receivable		230
	To recognize customer allowance		
May 20	Cash	6,764	
	Sales Discounts	356	
	Accounts Receivable		7,120
	To recognize payment, less discount, allowance and return		

Figure 2.66 *By: Rice University Source: Openstax CC BY NC-SA 4.0 Long Description*

Long Descriptions

A journal entry for January 5 shows a debit to Accounts Receivable for $2,450 and credit to Sales for $2,450 with the note “to recognize sale on credit, 2 ÷ 10, n ÷ 30,” followed by a debit to Cost of Goods Sold for $1,000 and credit to Merchandise Inventory for $1,000 with the note “to recognize cost of sale” also on January 5, followed by January 9 entries of a debit to Sales Returns and Allowances for $500 and credit to Accounts Receivable for $500 with the note “to recognize customer return” and a debit to Merchandise Inventory for $130 and credit to Cost of Goods Sold for $130 with the note “to recognize merchandise return to inventory,” followed by an entry on January 14 of debits to Cash for $1,911 and Sales Discounts for $39 and a credit to Accounts Receivable for $1,950 with the note “to recognize payment, less discount and return.” Return

Journal entries starting with Sales Transaction Journal Entries at the top, followed by Sale, Customer Payment, and Sales Returns and Allowances on the second tier, then Cash, Credit, Received Discount, Did not Receive Discount, Sales Returns, and Sales Allowances on the third tier, and Entry 1: Dr. Cash, Cr. Sales, Entry 2: Dr. Cost of Goods Sold, Cr. Merchandise Inventory; Entry 1: Dr. Accounts Receivable, Cr. Sales, Entry 2: Dr. Cost of Goods Sold, Cr. Merchandise Inventory; Dr. Cash and Sales Discounts, Cr. Accounts Receivable; Dr. Cash, Cr. Accounts Receivable; Entry 1: Dr. Sales Returns and Allowances, Cr. Cash or Accounts Receivable, Entry 2: Dr. Merchandise Inventory, Cr. Cost of Goods Sold; and Dr. Sales Returns and Allowances, Cr. Cash or Accounts Receivable on the bottom tier. Return

2.5 Shipping Terms

When you buy merchandise online, shipping charges are usually one of the negotiated terms of the sale. As a consumer, anytime the business pays for shipping, it is welcomed. For businesses, shipping charges bring both benefits and challenges, and the terms negotiated can have a significant impact on inventory operations.



Figure 2.67 Guida Siebert Dairy Milk Delivery Truck tractor trailer! *Shipping Merchandise. The basics of freight-in versus freight-out costs. Guida Siebert Dairy Milk Delivery Truck tractor trailer! By: Mike Mozart. Source: Flickr CC BY 2.0*

Shipping is determined by contract terms between a buyer and seller. There are several key factors to consider when determining who pays for shipping, and how it is recognized in merchandising transactions. The establishment of a transfer point and ownership indicates who pays the shipping charges, who is responsible for the merchandise, on whose balance sheet the assets would be recorded, and how to record the transaction for the buyer and seller.

Ownership of inventory refers to which party owns the inventory at a particular point in time—the buyer or the seller.

One particularly important point in time is the point of transfer, when the responsibility for the inventory transfers from the seller to the buyer. Establishing ownership of inventory is important to determine who pays the shipping charges when the goods are in transit as well as the responsibility of each party when the goods are in their possession. Goods in transit refers to the time in which the merchandise is transported from the seller to the buyer (by way of delivery truck, for example). One party is responsible for the goods in transit and the costs associated with transportation. Determining whether this responsibility lies with the buyer or seller is critical to determining the reporting requirements of the retailer or merchandiser.

Freight-in refers to the shipping costs for which the buyer is responsible when receiving shipment from a seller, such as delivery and insurance expenses. When the buyer is responsible for shipping costs, they recognize this as part of the purchase cost. This means that the shipping costs stay with the inventory until it is sold. The cost principle requires this expense to stay with the merchandise as it is part of getting the item ready for sale from the buyer's perspective. The shipping expenses are held in inventory until sold, which means these costs are reported on the balance sheet in Merchandise Inventory. When the merchandise is sold, the shipping charges are transferred with all other inventory costs to Cost of Goods Sold on the income statement.

For example, California Business Solutions (CBS) may purchase 30 computers from a manufacturer for $80 and part of the agreement is that CBS (the buyer) pays the shipping costs of $1,000. CBS would record the following entry to recognize the purchase of the goods and the freight-in.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Inventory Accounts Payable *To recognize purchase of goods and freight-in* *(30 × $80) + $1,000*	3,400	3,400

Figure 2.68 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Merchandise Inventory increases (debit), and Cash decreases (credit), for the entire cost of the purchase, including shipping, insurance, and taxes. On the balance sheet, the shipping charges would remain a part of inventory.

Freight-out refers to the costs for which the seller is responsible when shipping to a buyer, such as delivery and insurance expenses. When the seller is responsible for shipping costs, they recognize this as a delivery expense. The delivery expense is specifically associated with selling and not daily operations; thus, delivery expenses are typically recorded as a selling and administrative expense on the income statement in the current period.

For example, CBS may sell electronics packages to a customer and agree to cover the $100 cost associated with shipping and insurance. CBS would record the following entry to recognize freight-out.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Delivery Expense Cash *To recognize freight-out shipping costs*	100	100

Figure 2.69 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Delivery Expense increases (debit) and Cash decreases (credit) for the shipping cost amount of $100. On the income

statement, this $100 delivery expense will be grouped with Selling and Administrative expenses.

Free on Board (FOB) Shipping and Destination

Transportation costs are commonly assigned to either the buyer or the seller based on the free on board (FOB) terms, as the terms relate to the seller. Transportation costs are part of the responsibilities of the owner of the product, so determining the owner at the shipping point identifies who should pay for the shipping costs. The seller's responsibility and ownership of the goods ends at the point that is listed after the FOB designation. Thus, FOB shipping point means that the seller transfers title and responsibility to the buyer at the shipping point, so the buyer would owe the shipping costs. The purchased goods would be recorded on the buyer's balance sheet at this point.

Similarly, FOB destination means the seller transfers title and responsibility to the buyer at the destination, so the seller would owe the shipping costs. Ownership of the product is the trigger that mandates that the asset be included on the company's balance sheet. In summary, the goods belong to the seller until they transition to the location following the term FOB, making the seller responsible for everything about the goods to that point, including recording purchased goods on the balance sheet . If something happens to damage or destroy the goods before they reach the FOB location, the seller would be required to replace the product or reverse the sales transaction.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=183#oembed-1

Discussion and Application of FOB Destination

As you've learned, the seller and buyer will establish terms of purchase that include the purchase price, taxes, insurance, and shipping charges. So, who pays for shipping? On the purchase contract, shipping terms establish who owns inventory in transit, the point of transfer, and who pays for shipping. The shipping terms are known as "free on board," or simply FOB. Some refer to FOB as the point of transfer, but really, it incorporates more than simply the point at which responsibility transfers. There are two FOB considerations: FOB Destination and FOB Shipping Point.

If FOB destination point is listed on the purchase contract, this means the seller pays the shipping charges (freight-out). This also means goods in transit belong to, and are the responsibility of, the seller. The point of transfer is when the goods reach the buyer's place of business.

To illustrate, suppose CBS sells 30 landline telephones at $150 each on credit at a cost of $60 per phone. On the sales contract, FOB Destination is listed as the shipping terms, and shipping charges amount to $120, paid as cash directly to the delivery service. The following entries occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Accounts Receivable	4,500	
	Sales		4,500
	To recognize sale, FOB Destination, 30 × $150		
	COGS	1,800	
	Merchandise Inventory		1,800
	To recognize cost of sale, 30 × $60		
	Delivery Expense	120	
	Cash		120
	To recognize freight-out shipping costs		

Figure 2.70 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Accounts Receivable (debit) and Sales (credit) increases for the amount of the sale (30 × $150). Cost of Goods Sold increases (debit) and Merchandise Inventory decreases (credit) for the cost of sale (30 × $60). Delivery Expense increases (debit) and Cash decreases (credit) for the delivery charge of $120.

Discussion and Application of FOB Shipping Point

If FOB shipping point is listed on the purchase contract, this means the buyer pays the shipping charges (freight-in). This also means goods in transit belong to, and are the responsibility of, the buyer. The point of transfer is when the goods leave the seller's place of business.

Suppose CBS buys 40 tablet computers at $60 each on credit. The purchase contract shipping terms list FOB Shipping Point. The shipping charges amount to an extra $5 per tablet computer. All other taxes, fees, and insurance are included in the purchase price of $60. The following entry occurs to recognize the purchase.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Merchandise Inventory Accounts Payable *To recognize purchase on credit, FOB Shipping Point, 40 × $65*	2,600	2,600

Figure 2.71 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Merchandise Inventory increases (debit) and Accounts Payable increases (credit) by the amount of the purchase, including all shipping, insurance, taxes, and fees [(40 × $60) + (40 × $5)].

Figure 2.72 shows a comparison of shipping terms.

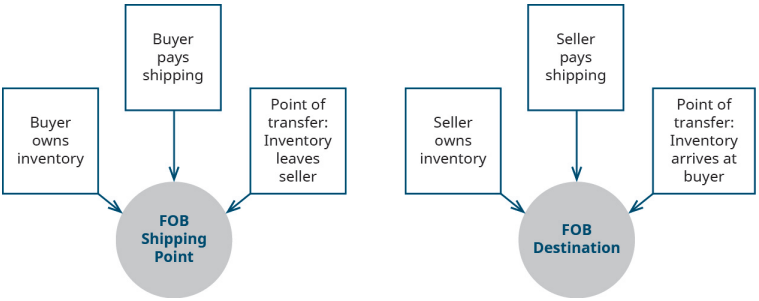


Figure 2.72 FOB Shipping Point versus FOB Destination*. A comparison of shipping terms. FOB Shipping Point versus FOB Destination. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

2.6 Accounting for Inventory

Accounting for inventory is a critical function of management. Inventory accounting is significantly complicated by the fact that it is an ongoing process of constant change, in part because (1) most companies offer a large variety of products for sale, (2) product purchases occur at irregular times, (3) products are acquired for differing prices, and (4) inventory acquisitions are based on sales projections, which are always uncertain and often sporadic. Merchandising companies must meticulously account for every individual product that they sell, equipping them with essential information, for decisions such as these:

- What is the quantity of each product that is available to customers?
- When should inventory of each product item be replenished and at what quantity?
- How much should the company charge customers for each product to cover all costs plus profit margin?
- How much of the inventory cost should be allocated toward the units sold (cost of goods sold) during the period?
- How much of the inventory cost should be allocated toward the remaining units (ending inventory) at the end of the period?
- Is each product moving robustly or have some individual inventory items' activity decreased?
- Are some inventory items obsolete?

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The company's financial statements report the combined cost of all items sold as an offset to the proceeds from those sales, producing the net number referred to as gross margin (or gross profit). This is presented in the first part of the results of operations for the period on the multi-step income statement. The unsold inventory at period end is an asset to the company and is therefore included in the company's financial statements, on the balance sheet, as shown in Figure 2.73. The total cost of all the inventory that remains at period end, reported as merchandise inventory on the balance sheet, plus the total cost of the inventory that was sold or otherwise removed (through shrinkage, theft, or other loss), reported as cost of goods sold on the income statement (see Figure 2.73), represent the entirety of the inventory that the company had to work with during the period, or goods available for sale.

SIERRA SPORTS Balance Sheet (partial) December 31, 2017	
Assets	
Current Assets	
Cash	$21,580
Accounts Receivable	2,000
Inventory	60,000

SIERRA SPORTS Income Statement (partial) For Year Ended December 31, 2017	
Revenues	
Total Revenues	$19,500
Cost of Goods Sold	9,000
Gross Profit	10,500

Figure 2.73 Financial Statement Effects of Inventory Transactions
By: Rice University Source: Openstax CC BY-NC-SA 4.0

Fundamentals of Inventory

Although our discussion will consider inventory issues from the perspective of a retail company, using a resale or merchandising operation, inventory accounting also encompasses recording and reporting of manufacturing operations. In the manufacturing environment, there would be separate inventory calculations for the various process levels of inventory, such as raw materials, work in process, and finished goods. The manufacturer's finished goods inventory is equivalent to the merchandiser's inventory account in that it includes finished goods that are available for sale.

In merchandising companies, inventory is a company asset that includes beginning inventory plus purchases, which include all additions to inventory during the period. Every time the company sells products to customers, they dispose of a portion of the company's inventory asset. Goods available for sale refers to the total cost of all inventory that the company had on hand at any time during the period, including beginning inventory and all inventory purchases. These goods were normally either sold to customers during the period (occasionally lost due to spoilage, theft, damage, or other types of shrinkages) and thus reported as cost of goods sold, an expense account on the income statement, or these goods are still in inventory at the end of the period and reported as ending merchandise inventory, an asset account on the balance sheet. As an example, assume that Harry's Auto Parts Store sells oil filters. Suppose that at the end of January 31, 2018, they had 50 oil filters on hand at a cost of $7 per unit. This means that at the beginning of February, they had 50 units in inventory at a total cost of $350 (50 × $7). During the month, they purchased 20 filters at a cost of $7, for a total cost of $140 (20 × $7). At the end of the month, there were 18 units left in inventory. Therefore, during the month of February, they

sold 52 units. Figure 2.74 illustrates how to calculate the goods available for sale and the cost of goods sold.

	Number of Units	Cost per Unit	Total Cost
Beginning Inventory, January 31, 2018	50	$7	$350
+ purchases during February 2018	20	$7	140
Total Goods Available for Sale	**70**		**$490**
– Ending Inventory, February 28, 2018	18	$7	126
Cost of Goods Sold for February 2018	**52**		**$364**

Figure 2.74 Fundamentals of Inventory Accounting *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Inventory costing is accomplished by one of four specific costing methods: (1) specific identification, (2) first-in, first-out, (3) last-in, first-out, and (4) weighted-average cost methods. All four methods are techniques that allow management to distribute the costs of inventory in a logical and consistent manner, to facilitate matching of costs to offset the related revenue item that is recognized during the period, in accordance with GAAP expense recognition and matching concepts. Note that a company's cost allocation process represents management's chosen method for expensing product costs, based strictly on estimates of the flow of inventory costs, which is unrelated to the actual flow of the physical inventory. Use of a cost allocation strategy eliminates the need for often cost-prohibitive individual tracking of costs of each specific inventory item, for which purchase prices may vary greatly. In this chapter, you will be provided with some background concepts and explanations of terms associated with inventory as well as a basic demonstration of each of the four allocation methods, and then further delineation of the application and nuances of the costing methods.

Data for Demonstration of the Four Basic Inventory Valuation Methods

The following dataset will be used to demonstrate the application and analysis of the four methods of inventory accounting.

Company: Spy Who Loves You Corporation

Product: Global Positioning System (GPS) Tracking Device

Description: This product is an economical real-time GPS tracking device, designed for individuals who wish to monitor others' whereabouts. It is marketed to parents of middle school and high school students as a safety measure. Parents benefit by being apprised of the child's location, and the student benefits by not having to constantly check in with parents. Demand for the product has spiked during the current fiscal period, while supply is limited, causing the selling price to escalate rapidly.

SPY WHO LOVES YOU TRACKER			
	Number of Units	Unit Cost	Sales Price
Beginning Inventory Jul. 1	150	$21	
Sold Jul. 5	120		$36
Purchased Jul. 10	225	27	
Sold Jul. 15	180		39
Purchased Jul. 25	210	33	
Ending Inventory Jul. 31	285		

Figure 2.75 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Specific Identification Method

The specific identification method refers to tracking the actual cost of the item being sold and is generally used only on expensive items that are highly customized (such as tracking detailed costs for each individual car in automobiles sales) or inherently distinctive (such as tracking origin and cost for each

unique stone in diamond sales). This method is too cumbersome for goods of large quantity, especially if there are not significant feature differences in the various inventory items of each product type. However, for purposes of this demonstration, assume that the company sold one specific identifiable unit, which was purchased in the second lot of products, at a cost of $27.

Three separate lots of goods are purchased:

	Number of Units	Unit Cost
Lot 1	150	$21
Lot 2*	225	27
Lot 3	210	33

Sales revenue	$36
– Cost, assuming SI, unit assumed sold from Lot 2*	27
= Gross margin for one unit	9

Note: one unit sold for $36, using the specific identification (SI) costing method

Figure 2.76 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

First-in, First-out (FIFO) Method

The first-in, first-out method (FIFO) records costs relating to a sale as if the earliest purchased item would be sold first. However, the physical flow of the units sold under both the periodic and perpetual methods would be the same. Due to the mechanics of the determination of costs of goods sold under the perpetual method, based on the timing of additional purchases of inventory during the accounting period, it is possible that the costs of goods sold might be slightly different for an accounting period. Since FIFO assumes that the first items purchased are sold first, the latest acquisitions would be the items that remain in inventory at the end of the period and would constitute ending inventory.

Three separate lots of goods are purchased:

	Number of Units	Unit Cost
Lot 1*	150	$21
Lot 2	225	27
Lot 3	210	33

Sales revenue	$36
– Cost, assuming FIFO, unit assumed sold from Lot 1*	21
= Gross margin for one unit	15

Note: one unit sold for $36, using the FIFO costing method

Figure 2.77 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Last-in, First-out (LIFO) Method

The last-in, first out method (LIFO) records costs relating to a sale as if the latest purchased item would be sold first. As a result, the earliest acquisitions would be the items that remain in inventory at the end of the period.

Three separate lots of goods are purchased:

	Number of Units	Unit Cost
Lot 1	150	$21
Lot 2	225	27
Lot 3*	210	33

Sales revenue	$36
– Cost, assuming LIFO, unit assumed sold from Lot 3*	33
= Gross margin for one unit	3

Note: one unit sold for $36, using the LIFO costing method

Figure 2.78 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Weighted-Average Cost Method

The weighted-average cost method (sometimes referred to as the average cost method) requires a calculation of the average cost of all units of each particular inventory items. The average is obtained by multiplying the number of units by the cost paid per unit for each lot of goods, then adding the calculated total value of all lots together, and finally dividing the total cost by the total number of units for that product. As a caveat relating to the average cost method, note that a new average cost must be calculated after every change in inventory to reassess the per-unit weighted-average value of the goods. This laborious

requirement might make use of the average method cost-prohibitive.

Three separate lots of goods are purchased:

	Number of Units	Unit Cost
Lot 1	150	$21
Lot 2	225	27
Lot 3	210	33

Sales revenue	$36.00
– Cost, assuming average cost of units sold from Lots 1, 2, and 3*	27.62
= Gross margin for one unit	8.38

Note: one unit sold for $36, using the weighted average costing method

*[(150 × $21) + (225 × $27) + (210 × $33)]/585 = $27.62 average

Figure 2.79 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Comparing the various costing methods for the sale of one unit in this simple example reveals a significant difference that the choice of cost allocation method can make. Note that the sales price is not affected by the cost assumptions; only the cost amount varies, depending on which method is chosen. Figure 2.80 depicts the different outcomes that the four methods produced.

	Sp ID	FIFO	LIFO	AVG
Sales revenue	36	36	36	36.00
– Cost, under each cost allocation method	27	21	33	27.62
= Gross margin for one unit	9	15	3	8.38

Figure 2.80 Comparison of the Four Costing Methods *One unit sold for $36 Comparison of the Four Costing Methods. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Once the methods of costing are determined for the company, that methodology would typically be applied repeatedly over the remainder of the company's history to accomplish the generally accepted accounting principle of consistency from one period to another. It is possible to change methods if the company finds that a different method more accurately reflects results of operations, but the change requires

disclosure in the company's notes to the financial statements, which alerts financial statement users of the impact of the change in methodology. Also, it is important to realize that although the Internal Revenue Service generally allows differing methods of accounting treatment for tax purposes than for financial statement purposes, an exception exists that prohibits the use of LIFO inventory costing on the company tax return unless LIFO is also used for the financial statement costing calculations.

Additional Inventory Issues

Various other issues that affect inventory accounting include consignment sales, transportation and ownership issues, inventory estimation tools, and the effects of inflationary versus deflationary cycles on various methods.

Consignment

Consigned goods refer to merchandise inventory that belongs to a third party but which is displayed for sale by the company. These goods are not owned by the company and thus must not be included on the company's balance sheet nor be used in the company's inventory calculations. The company's profit relating to consigned goods is normally limited to a percentage of the sales proceeds at the time of sale.

For example, assume that you sell your office and your current furniture doesn't match your new building. One way to dispose of the furniture would be to have a consignment shop sell it. The shop would keep a percentage of the sales revenue and pay you the remaining balance. Assume in this example that the shop will keep one-third of the sales proceeds and pay

you the remaining two-thirds balance. If the furniture sells for $15,000, you would receive $10,000 and the shop would keep the remaining $5,000 as its sales commission. A key point to remember is that until the inventory, in this case your office furniture, is sold, you still own it, and it is reported as an asset on your balance sheet and not an asset for the consignment shop. After the sale, the buyer is the owner, so the consignment shop is never the property's owner.

Lower-of-Cost-or-Market (LCM)

Reporting inventory values on the balance sheet using the accounting concept of conservatism (which discourages overstatement of net assets and net income) requires inventory to be calculated and adjusted to a value that is the lower of the cost calculated using the company's chosen valuation method or the market value based on the market or replacement value of the inventory items. Thus, if traditional cost calculations produce inventory values that are overstated, the lower-of-cost-or-market (LCM) concept requires that the balance in the inventory account should be decreased to the more conservative replacement value rather than be overstated on the balance sheet.

Estimating Inventory Costs: Gross Profit Method and Retail Inventory Method

Sometimes companies have a need to estimate inventory values. These estimates could be needed for interim reports, when physical counts are not taken. The need could be result from a natural disaster that destroys part or all of the inventory or from an error that causes inventory counts to be

compromised or omitted. Some specific industries (such as select retail businesses) also regularly use these estimation tools to determine cost of goods sold. Although the method is predictable and simple, it is also less accurate since it is based on estimates rather than actual cost figures.

The gross profit method is used to estimate inventory values by applying a standard gross profit percentage to the company's sales totals when a physical count is not possible. The resulting gross profit can then be subtracted from sales, leaving an estimated cost of goods sold. Then the ending inventory can be calculated by subtracting cost of goods sold from the total goods available for sale. Likewise, the retail inventory method estimates the cost of goods sold, much like the gross profit method does, but uses the retail value of the portions of inventory rather than the cost figures used in the gross profit method.

Inflationary Versus Deflationary Cycles

As prices rise (inflationary times), FIFO ending inventory account balances grow larger even when inventory unit counts are constant, while the income statement reflects lower cost of goods sold than the current prices for those goods, which produces higher profits than if the goods were costed with current inventory prices. Conversely, when prices fall (deflationary times), FIFO ending inventory account balances decrease and the income statement reflects higher cost of goods sold and lower profits than if goods were costed at current inventory prices. The effect of inflationary and deflationary cycles on LIFO inventory valuation are the exact opposite of their effects on FIFO inventory valuation.

Shrink- what is it?



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2.7 Inventory Cost Flow Methods- Periodic System

As you've learned, the periodic inventory system is updated at the end of the period to adjust inventory numbers to match the physical count and provide accurate merchandise inventory values for the balance sheet. The adjustment ensures that only the inventory costs that remain on hand are recorded, and the remainder of the goods available for sale are expensed on the income statement as cost of goods sold. Here we will demonstrate the mechanics used to calculate the ending inventory values using the four cost allocation methods and the periodic inventory system.

Information Relating to All Cost Allocation Methods, but Specific to Periodic Inventory Updating

Let's return to the example of The Spy Who Loves You Corporation to demonstrate the four cost allocation methods, assuming inventory is updated at the end of the period using the periodic system.

Cost Data for Calculations

Company: Spy Who Loves You Corporation
Product: Global Positioning System (GPS) Tracking Device

Description: This product is an economical real-time GPS tracking device, designed for individuals who wish to monitor others' whereabouts. It is being marketed to parents of middle school and high school students as a safety measure. Parents benefit by being apprised of the child's location, and the student benefits by not having to constantly check in with parents. Demand for the product has spiked during the current fiscal period, while supply is limited, causing the selling price to escalate rapidly. Note: For simplicity of demonstration, beginning inventory cost is assumed to be $21 per unit for all cost assumption methods.

SPY WHO LOVES YOU TRACKER			
	Number of Units	Unit Cost	Sales Price
Beginning Inventory Jul. 1	150	$21	
Sold Jul. 5	120		$36
Purchased Jul. 10	225	27	
Sold Jul. 15	180		39
Purchased Jul. 25	210	33	
Ending Inventory Jul. 31	285		

Figure 2.81 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Specific Identification

The specific units assumed to be sold in this period are designated as follows, with the specific inventory distinction being associated with the lot numbers:

- Sold 120 units, all from Lot 1 (beginning inventory), costing $21 per unit
- Sold 180 units, 20 from Lot 1 (beginning inventory), costing $21 per unit; 160 from the Lot 2 (July 10 purchase), costing $27 per unit

The specific identification method of cost allocation directly tracks each of the units purchased and costs them out as they are actually sold. In this demonstration, assume that some sales were made by specifically tracked goods that are part of a lot, as previously stated for this method. So for The Spy Who Loves You, considering the entire period together, note that

- 140 of the 150 units that were purchased for $21 were sold, leaving 10 of $21 units remaining
- 160 of the 225 units that were purchased for $27 were sold, leaving 65 of the $27 units remaining
- none of the 210 units that were purchased for $33 were sold, leaving all 210 of the $33 units remaining

Ending inventory was made up of 10 units at $21 each, 65 units at $27 each, and 210 units at $33 each, for a total specific identification ending inventory value of $8,895. Subtracting this ending inventory from the $16,155 total of goods available for sale leaves $7,260 in cost of goods sold this period.

Calculations of Costs of Goods Sold, Ending Inventory, and Gross Margin, Specific Identification

The specific identification costing assumption tracks inventory items individually, so that when they are sold, the exact cost of the item is used to offset the revenue from the sale. The cost of goods sold, inventory, and gross margin shown in Figure 2.82 were determined from the previously-stated data, particular to specific identification costing.

Cost of Goods Sold	
Beginning Inventory	$ 3,150
+ Purchases	13,005
= Goods Available	16,155
– Ending Inventory	8,895
Cost of Goods Sold	7,260

Cost Value	
10 units at $21	$ 210
65 units at $27	1,755
210 units at $33	6,930
Total	8,895

Note: Purchases = (225 × $27) + (210 × $33)

Figure 2.82 Specific Identification Costing Assumption *Cost of Goods Sold and Cost Value. Specific Identification Costing Assumption. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The gross margin, resulting from the specific identification periodic cost allocations of $7,260, is shown in Figure 2.83.

Gross Margin	
Sales	$11,340
– Cost of Goods Sold	7,260
= Gross Margin	4,080

(120 × $36) + (180 × 39)

Figure 2.83 Specific Identification Periodic Cost Allocations Gross Margin *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Calculation for the Ending Inventory Adjustment under Periodic/Specific Identification Methods

Merchandise inventory, before adjustment, had a balance of $3,150, which was the beginning inventory. Journal entries are not shown, but the following calculations provide the information that would be used in recording the necessary journal entries. The inventory at the end of the period should be $8,895, requiring an entry to increase merchandise inventory

by $5,745. Cost of goods sold was calculated to be $7,260, which should be recorded as an expense. The credit entry to balance the adjustment is $13,005, which is the total amount that was recorded as purchases for the period. This entry distributes the balance in the purchases account between the inventory that was sold (cost of goods sold) and the amount of inventory that remains at period end (merchandise inventory).

First-in, First-out (FIFO)

The first-in, first-out method (FIFO) of cost allocation assumes that the earliest units purchased are also the first units sold. For The Spy Who Loves You, considering the entire period, 300 of the 585 units available for the period were sold, and if the earliest acquisitions are considered sold first, then the units that remain under FIFO are those that were purchased last. Following that logic, ending inventory included 210 units purchased at $33 and 75 units purchased at $27 each, for a total FIFO periodic ending inventory value of $8,955. Subtracting this ending inventory from the $16,155 total of goods available for sale leaves $7,200 in cost of goods sold this period.

FIFO Periodic Ending Inventory Value	
Units Sold (180 +120) = 300 units	
150 units x $21	$3,150
150 units x $27	4,050
Total Sold equals 300 units	
Cost of Goods Sold	$7,200
Ending Inventory	
210 units x $33	6,930
75 units x $27	2,025
Ending Inventory Value	$8,955

Figure 2.84 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Calculations of Costs of Goods Sold, Ending Inventory, and Gross Margin, First-in, First-out (FIFO)

The FIFO costing assumption tracks inventory items based on segments or lots of goods that are tracked, in the order that they were acquired, so that when they are sold, the earliest acquired items are used to offset the revenue from the sale. The cost of goods sold, inventory, and gross margin shown in Figure 2.85 were determined from the previously-stated data, particular to FIFO costing.

Cost of Goods Sold	
Beginning Inventory	$ 3,150
+ Purchases	13,005
= Goods Available	16,155
– Ending Inventory	8,955
Cost of Goods Sold	7,200

Cost Value	
75 units at $27	$2,025
210 units at $33	6,930
Total	8,955

Note: Purchases = (225 × $27) + (210 × $33)

Figure 2.85 FIFO Costing Assumption Cost of Goods Sold and Cost Value *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The gross margin, resulting from the FIFO periodic cost allocations of $7,200, is shown in Figure 2.86.

Gross Margin	
Sales	$11,340
– Cost of Goods Sold	7,200
= Gross Margin	4,140

Figure 2.86 FIFO Periodic Cost Allocations Gross Margin *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Calculations for Inventory Adjustment, Periodic/ First-in, First-out (FIFO)

Beginning merchandise inventory had a balance of $3,150 before adjustment. The inventory at period end should be $8,955, requiring an entry to increase merchandise inventory by $5,895. Journal entries are not shown, but the following calculations provide the information that would be used in recording the necessary journal entries. Cost of goods sold was calculated to be $7,200, which should be recorded as an expense. The credit entry to balance the adjustment is for $13,005, which is the total amount that was recorded as purchases for the period. This entry distributes the balance in the purchases account between the inventory that was sold (cost of goods sold) and the amount of inventory that remains at period end (merchandise inventory).

Last-in, First-out (LIFO)

The last-in, first-out method (LIFO) of cost allocation assumes

that the last units purchased are the first units sold. For The Spy Who Loves You, considering the entire period together, 300 of the 585 units available for the period were sold, and if the latest acquisitions are considered sold first, then the units that remain under LIFO are those that were purchased first. Following that logic, ending inventory included 150 units purchased at $21 and 135 units purchased at $27 each, for a total LIFO periodic ending inventory value of $6,795. Subtracting this ending inventory from the $16,155 total of goods available for sale leaves $9,360 in cost of goods sold this period.

LIFO Periodic Ending Inventory Value	
Units Sold (210 + 90) = 300 Units	
210 units x $33	$6,930
90 units x $27	2,430
Total Sold equals 300 units	
Cost of Goods Sold	9,360
Ending Inventory	
150 units x $21	3,150
135 units x $27	3,645
Ending Inventory Value	$6,795

Figure 2.87 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

It is important to note that these answers can differ when calculated using the perpetual method. When perpetual methodology is utilized, the cost of goods sold and ending inventory are calculated at the time of each sale rather than at the end of the month. For example, in this case, when the first sale of 150 units is made, inventory will be removed and cost computed as of that date from the beginning inventory. The

differences in timing as to when cost of goods sold is calculated can alter the order that costs are sequenced.

Calculations of Costs of Goods Sold, Ending Inventory, and Gross Margin, Last-in, First-out (LIFO)

The LIFO costing assumption tracks inventory items based on lots of goods that are tracked, in the order that they were acquired, so that when they are sold, the latest acquired items are used to offset the revenue from the sale. The following cost of goods sold, inventory, and gross margin were determined from the previously-stated data, particular to LIFO costing.

Cost of Goods Sold	
Beginning Inventory	$ 3,150
+ Purchases	13,005
= Goods Available	16,155
– Ending Inventory	6,795
Cost of Goods Sold	9,360

Cost Value	
150 units at $21	$3,150
135 units at $27	3,645
Total	6,795

Note: Purchases = (225 × $27) + (210 × $33)

Figure 2.88 LIFO Costing Assumption Cost of Goods Sold and Cost Value *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The gross margin, resulting from the LIFO periodic cost allocations of $9,360, is shown in Figure 2.89.

Gross Margin	
Sales	$11,340
– Cost of Goods Sold	9,360
= Gross Margin	1,980

Figure 2.89 LIFO Periodic Cost Allocations Gross Margin *By: Rice University Source: Openstax CC BY-NC-SA 4.0)*

Calculations for Inventory Adjustment, Periodic/ Last-in, First-out (LIFO)

Beginning merchandise inventory had a balance before adjustment of $3,150. The inventory at period end should be $6,795, requiring an entry to increase merchandise inventory by $3,645. Journal entries are not shown, but the following calculations provide the information that would be used in recording the necessary journal entries. Cost of goods sold was calculated to be $9,360, which should be recorded as an expense. The credit entry to balance the adjustment is for $13,005, which is the total amount that was recorded as purchases for the period. This entry distributes the balance in the purchases account between the inventory that was sold (cost of goods sold) and the amount of inventory that remains at period end (merchandise inventory).

Weighted-Average Cost (AVG)

Weighted-average cost allocation requires computation of the average cost of all units in goods available for sale at the time the sale is made. For The Spy Who Loves You, considering the entire period, the weighted-average cost is computed by dividing total cost of goods available for sale ($16,155) by the total number of available units (585) to get the average cost of $27.62. Note that 285 of the 585 units available for sale during the period remained in inventory at period end. Following that logic, ending inventory included 285 units at an average cost of $27.62 for a total AVG periodic ending inventory value of $7,872. Subtracting this ending inventory from the $16,155 total of goods available for sale leaves $8,283 in cost of goods sold this period. It is important to note that final numbers can often differ by one or two cents due to rounding of the calculations.

In this case, the cost comes to $27.6154 but rounds up to the stated cost of $27.62.

Calculations of Costs of Goods Sold, Ending Inventory, and Gross Margin, Weighted Average (AVG)

The AVG costing assumption tracks inventory items based on lots of goods that are tracked but averages the cost of all units on hand every time an addition is made to inventory so that, when they are sold, the most recently averaged cost items are used to offset the revenue from the sale. The cost of goods sold, inventory, and gross margin shown in Figure 2.90 were determined from the previously-stated data, particular to AVG costing.

Cost of Goods Sold	
Beginning Inventory	$ 3,150
+ Purchases	13,005
= Goods Available	16,155
– Ending Inventory	7,872
Cost of Goods Sold	8,283

Cost Value	
285 units at $27.62	$7,872
Total	7,872

Note: Purchases = (225 × $27) + (210 × $33)

Figure 2.90 AVG Costing Assumption Cost of Goods Sold and Cost Value *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Figure 2.91 shows the gross margin resulting from the weighted-average periodic cost allocations of $8283.

Gross Margin	
Sales	$11,340
– Cost of Goods Sold	8,283
= Gross Margin	3,057

Figure 2.91 Weighted AVG Periodic Cost Allocations Gross Margin *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Journal Entries for Inventory Adjustment, Periodic/Weighted Average

Beginning merchandise inventory had a balance before adjustment of $3,150. The inventory at period end should be $7,872, requiring an entry to increase merchandise inventory by $4,722. Journal entries are not shown, but the following calculations provide the information that would be used in recording the necessary journal entries. Cost of goods sold was calculated to be $8,283, which should be recorded as an expense. The credit entry to balance the adjustment is for $13,005, which is the total amount that was recorded as purchases for the period. This entry distributes the balance in the purchases account between the inventory that was sold (cost of goods sold) and the amount of inventory that remains at period end (merchandise inventory).

2.8 Inventory Cost Flow Methods- Perpetual System

As you've learned, the perpetual inventory system is updated continuously to reflect the current status of inventory on an ongoing basis. Modern sales activity commonly uses electronic identifiers—such as bar codes and RFID technology—to account for inventory as it is purchased, monitored, and sold. Specific identification inventory methods also commonly use a manual form of the perpetual system. Here we'll demonstrate the mechanics implemented when using perpetual inventory systems in inventory accounting, whether those calculations are orchestrated in a laborious manual system or electronically (in the latter, the inventory accounting operates effortlessly behind the scenes but nonetheless utilizes the same perpetual methodology).

CONCEPTS IN PRACTICE

Perpetual Inventory's Advancements through Technology

Perpetual inventory has been seen as the wave of the future for many years. It has grown since the 1970s alongside the development of affordable personal computers. Universal product codes, commonly known as UPC barcodes, have advanced inventory management for large and small retail

organizations, allowing real-time inventory counts and reorder capability that increased popularity of the perpetual inventory system. These UPC codes identify specific products but are not specific to the particular batch of goods that were produced. Electronic product codes (EPCs) such as radio frequency identifiers (RFIDs) are essentially an evolved version of UPCs in which a chip/identifier is embedded in the EPC code that matches the goods to the actual batch of product that was produced. This more specific information allows better control, greater accountability, increased efficiency, and overall quality monitoring of goods in inventory. The technology advancements that are available for perpetual inventory systems make it nearly impossible for businesses to choose periodic inventory and forego the competitive advantages that the technology offers.

Information Relating to All Cost Allocation Methods, but Specific to Perpetual Inventory Updating

Let's return to The Spy Who Loves You Corporation data to demonstrate the four cost allocation methods, assuming inventory is updated on an ongoing basis in a perpetual system.

Cost Data for Calculations

Company: Spy Who Loves You Corporation

Product: Global Positioning System (GPS) Tracking Device

Description: This product is an economical real-time GPS tracking device, designed for individuals who wish to monitor others' whereabouts. It is being marketed to parents of middle school and high school students as a safety measure. Parents benefit by being apprised of the child's location, and the student benefits by not having to constantly check in with parents. Demand for the product has spiked during the current fiscal period, while supply is limited, causing the selling price to escalate rapidly. Note: For simplicity of demonstration, beginning inventory cost is assumed to be $21 per unit for all cost assumption methods.

SPY WHO LOVES YOU TRACKER			
	Number of Units	Unit Cost	Sales Price
Beginning Inventory Jul. 1	150	$21	
Sold Jul. 5	120		$36
Purchased Jul. 10	225	27	
Sold Jul. 15	180		39
Purchased Jul. 25	210	33	
Ending Inventory Jul. 31	185		

Figure 2.92 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Calculations for Inventory Purchases and Sales during the Period, Perpetual Inventory Updating

Regardless of which cost assumption is chosen, recording inventory sales using the perpetual method involves recording both the revenue and the cost from the transaction for each individual sale. As additional inventory is purchased during the period, the cost of those goods is added to the merchandise inventory account. Normally, no significant adjustments are needed at the end of the period (before financial statements

are prepared) since the inventory balance is maintained to continually parallel actual counts.

Specific Identification

For demonstration purposes, the specific units assumed to be sold in this period are designated as follows, with the specific inventory distinction being associated with the lot numbers:

- Sold 120 units, all from Lot 1 (beginning inventory), costing $21 per unit
- Sold 180 units, 20 from Lot 1 (beginning inventory), costing $21 per unit; 160 from Lot 2 (July 10 purchase), costing $27 per unit

The specific identification method of cost allocation directly tracks each of the units purchased and costs them out as they are sold. In this demonstration, assume that some sales were made by specifically tracked goods that are part of a lot, as previously stated for this method. For The Spy Who Loves You, the first sale of 120 units is assumed to be the units from the beginning inventory, which had cost $21 per unit, bringing the total cost of these units to $2,520. Once those units were sold, there remained 30 more units of the beginning inventory. The company bought 225 more units for $27 per unit. The second sale of 180 units consisted of 20 units at $21 per unit and 160 units at $27 per unit for a total second-sale cost of $4,740. Thus, after two sales, there remained 10 units of inventory that had cost the company $21, and 65 units that had cost the company $27 each. The last transaction was an additional purchase of 210 units for $33 per unit. Ending inventory was made up of 10 units at $21 each, 65 units at $27 each, and 210 units at $33 each, for a total specific identification perpetual ending inventory value of $8,895.

Calculations of Costs of Goods Sold, Ending Inventory, and Gross Margin, Specific Identification

The specific identification costing assumption tracks inventory items individually so that, when they are sold, the exact cost of the item is used to offset the revenue from the sale. The cost of goods sold, inventory, and gross margin shown in Figure 2.93 were determined from the previously-stated data, particular to specific identification costing.

	Cost of Goods Purchased			Cost of Goods Sold			Cost of Inventory Remaining		
	Number of Units	Unit Cost	Total Cost	Number of Units	Unit Cost	Total Cost	Number of Units	Unit Cost	Total Cost
Beginning, Jul. 1							150	$21	$3,150
Sale, Jul. 5				120	$21	$2,520	30	21	630
Purchase, Jul. 10	225	$27	$6,075				30 225	21 27	630 6,075
Sale, Jul. 15				20 160	21 27	420 4,320	10 65	21 27	210 1,755
Purchase, Jul. 25	210	33	6,930				10 65 210	21 27 33	210 1,755 6,930
Total Purchases in Jul.			$13,005	Total COGS		$7,260			

Cost Value:	
10 units at $21	210
65 units at $27	1,755
210 units at $33	6,930
Total	8,895

Figure 2.93 Specific Identification Costing Assumption Cost of Goods Sold, Inventory, and Cost Value *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Figure 2.94 shows the gross margin, resulting from the specific identification perpetual cost allocations of $7,260.

Gross Margin	
Sales	$11,340
– Cost of Goods Sold	7,260
= Gross Margin	4,080

(120 × $36) + (180 × $39)

Figure 2.94 Specific Identification Perpetual Cost Allocations Gross Margin *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Description of Journal Entries for Inventory Sales, Perpetual, Specific Identification

Journal entries are not shown, but the following discussion provides the information that would be used in recording the necessary journal entries. Each time a product is sold, a revenue entry would be made to record the sales revenue and the corresponding accounts receivable or cash from the sale. Because of the choice to apply perpetual inventory updating, a second entry made at the same time would record the cost of the item based on the actual cost of the items, which would be shifted from merchandise inventory (an asset) to cost of goods sold (an expense).

First-in, First-out (FIFO)

The first-in, first-out method (FIFO) of cost allocation assumes that the earliest units purchased are also the first units sold. For The Spy Who Loves You, using perpetual inventory updating, the first sale of 120 units is assumed to be the units from the beginning inventory, which had cost $21 per unit, bringing the

total cost of these units to $2,520. Once those units were sold, there remained 30 more units of beginning inventory. The company bought 225 more units for $27 per unit. At the time of the second sale of 180 units, the FIFO assumption directs the company to cost out the last 30 units of the beginning inventory, plus 150 of the units that had been purchased for $27. Thus, after two sales, there remained 75 units of inventory that had cost the company $27 each. The last transaction was an additional purchase of 210 units for $33 per unit. Ending inventory was made up of 75 units at $27 each, and 210 units at $33 each, for a total FIFO perpetual ending inventory value of $8,955.

Calculations of Costs of Goods Sold, Ending Inventory, and Gross Margin, First-in, First-out (FIFO)

The FIFO costing assumption tracks inventory items based on lots of goods that are tracked, in the order that they were acquired, so that when they are sold the earliest acquired items are used to offset the revenue from the sale. The cost of goods sold, inventory, and gross margin shown in Figure 2.95 were determined from the previously-stated data, particular to perpetual FIFO costing.

	Cost of Goods Purchased			Cost of Goods Sold			Cost of Inventory Remaining		
	Number of Units	Unit Cost	Total Cost	Number of Units	Unit Cost	Total Cost	Number of Units	Unit Cost	Total Cost
Beginning, Jul. 1							150	$21	$3,150
Sale, Jul. 5				120	$21	$2,520	30	21	630
Purchase, Jul. 10	225	$27	$6,075				30 225	21 27	630 6,075
Sale, Jul. 15				30 150	21 27	630 4,050	– 75	– 27	– 2,025
Purchase, Jul. 25	210	33	6,930				75 210	27 33	2,025 6,930
Total Purchases in Jul.			$13,005	Total COGS		$7,200			

Cost Value:	
75 units at $27	2,025
210 units at $33	6,930
Total	8,955

Figure 2.95 FIFO Costing Assumption Cost of Goods Purchased, Cost of Goods Sold, and Cost of Inventory Remaining *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Figure 2.96 shows the gross margin, resulting from the FIFO perpetual cost allocations of $7,200.

Gross Margin	
Sales	11,340
– Cost of Goods Sold	7,200
= Gross Margin	4,140

Figure 2.96 FIFO Perpetual Cost Allocations Gross Margin *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Description of Journal Entries for Inventory Sales, Perpetual, First-in, First-out (FIFO)

Journal entries are not shown, but the following discussion provides the information that would be used in recording the

necessary journal entries. Each time a product is sold, a revenue entry would be made to record the sales revenue and the corresponding accounts receivable or cash from the sale. When applying perpetual inventory updating, a second entry made at the same time would record the cost of the item based on FIFO, which would be shifted from merchandise inventory (an asset) to cost of goods sold (an expense).

Last-in, First-out (LIFO)

The last-in, first-out method (LIFO) of cost allocation assumes that the last units purchased are the first units sold. For The Spy Who Loves You, using perpetual inventory updating, the first sale of 120 units is assumed to be the units from the beginning inventory (because this was the only lot of good available, so it represented the last purchased lot), which had cost $21 per unit, bringing the total cost of these units in the first sale to $2,520. Once those units were sold, there remained 30 more units of beginning inventory. The company bought 225 more units for $27 per unit. At the time of the second sale of 180 units, the LIFO assumption directs the company to cost out the 180 units from the latest purchased units, which had cost $27 for a total cost on the second sale of $4,860. Thus, after two sales, there remained 30 units of beginning inventory that had cost the company $21 each, plus 45 units of the goods purchased for $27 each. The last transaction was an additional purchase of 210 units for $33 per unit. Ending inventory was made up of 30 units at $21 each, 45 units at $27 each, and 210 units at $33 each, for a total LIFO perpetual ending inventory value of $8,775.

Calculations of Costs of Goods Sold, Ending Inventory, and Gross Margin, Last-in, First-out (LIFO)

The LIFO costing assumption tracks inventory items based on lots of goods that are tracked in the order that they were acquired, so that when they are sold, the latest acquired items are used to offset the revenue from the sale. The following cost of goods sold, inventory, and gross margin were determined from the previously-stated data, particular to perpetual, LIFO costing.

	Cost of Goods Purchased			Cost of Goods Sold			Cost of Inventory Remaining		
	Number of Units	Unit Cost	Total Cost	Number of Units	Unit Cost	Total Cost	Number of Units	Unit Cost	Total Cost
Beginning, Jul. 1							150	$21	$3,150
Sale, Jul. 5				120	$21	$2,520	30	21	630
Purchase, Jul. 10	225	$27	$6,075				30 225	21 27	630 6,075
Sale, Jul. 15				180	27	4,860	30 45	21 27	630 1,215
Purchase, Jul. 25	210	$33	6,930				30 45 210	21 27 33	630 1,215 6,930
Total Purchases in Jul.			$13,005	Total COGS		$7,380			

Cost Value:	
30 units at $21	$ 630
45 units at $27	1,215
210 units at $33	6,930
Total	8,775

Figure 2.97 LIFO Costing Assumption Cost of Goods Purchased, Cost of Goods Sold, and Cost of Inventory Remaining *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Figure 2.98 shows the gross margin resulting from the LIFO perpetual cost allocations of $7,380.

Gross Margin	
Sales	11,340
– Cost of Goods Sold	7,380
= Gross Margin	3,960

Figure 2.98 LIFO Perpetual Cost Allocations Gross Margin *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Description of Journal Entries for Inventory Sales, Perpetual, Last-in, First-out (LIFO)

Journal entries are not shown, but the following discussion provides the information that would be used in recording the necessary journal entries. Each time a product is sold, a revenue entry would be made to record the sales revenue and the corresponding accounts receivable or cash from the sale. When applying apply perpetual inventory updating, a second entry made at the same time would record the cost of the item based on LIFO, which would be shifted from merchandise inventory (an asset) to cost of goods sold (an expense).

Weighted-Average Cost (AVG)

Weighted-average cost allocation requires computation of the average cost of all units in goods available for sale at the time the sale is made for perpetual inventory calculations. For The Spy Who Loves You, the first sale of 120 units is assumed to be the units from the beginning inventory (because this was the only lot of good available, so the price of these units also represents the average cost), which had cost $21 per unit,

bringing the total cost of these units in the first sale to $2,520. Once those units were sold, there remained 30 more units of the inventory, which still had a $21 average cost. The company bought 225 more units for $27 per unit. Recalculating the average cost, after this purchase, is accomplished by dividing total cost of goods available for sale (which totaled $6,705 at that point) by the number of units held, which was 255 units, for an average cost of $26.29 per unit. At the time of the second sale of 180 units, the AVG assumption directs the company to cost out the 180 at $26.29 for a total cost on the second sale of $4,732. Thus, after two sales, there remained 75 units at an average cost of $26.29 each. The last transaction was an additional purchase of 210 units for $33 per unit. Recalculating the average cost again resulted in an average cost of $31.24 per unit. Ending inventory was made up of 285 units at $31.24 each for a total AVG perpetual ending inventory value of $8,902 (rounded).[1]

Calculations of Costs of Goods Sold, Ending Inventory, and Gross Margin, Weighted Average (AVG)

The AVG costing assumption tracks inventory items based on lots of goods that are combined and re-averaged after each new acquisition to determine a new average cost per unit so that, when they are sold, the latest averaged cost items are used to offset the revenue from the sale. The cost of goods sold, inventory, and gross margin shown in Figure 2.99 were determined from the previously-stated data, particular to perpetual, AVG costing.

	Cost of Goods Purchased			Cost of Goods Sold			Cost of Inventory Remaining		
	Number of Units	Unit Cost	Total Cost	Number of Units	Unit Cost	Total Cost	Number of Units	Unit Cost	Total Cost
Beginning							150	$21.00	$3,150
Sale				120	$21.00	$2,520	30	21.00	630
Purchase	225	$27.00	$6,075				255	26.29	6,705
Sale				180	26.29	4,733	75	26.29	1,972
Purchase	210	33.00	6,930				285	31.24	8,902
Total Purchases			$13,005	Total COGS		$7,253			

Cost Value:	
285 units at $31.24	$8,902
Total	8,902

Figure 2.99 AVG Costing Assumption Cost of Goods Purchased, Cost of Goods Sold, and Cost of Inventory Remaining *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Figure 2.100 shows the gross margin, resulting from the weighted-average perpetual cost allocations of $7,253.

Gross Margin:	
Sales	$11,340
– Cost of Goods Sold	7,253
= Gross Margin	4,087

Figure 2.100 Weighted AVG Perpetual Cost Allocations Gross Margin *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Description of Journal Entries for Inventory Sales, Perpetual, Weighted Average (AVG)

Journal entries are not shown, but the following discussion provides the information that would be used in recording the necessary journal entries. Each time a product is sold, a revenue entry would be made to record the sales revenue and

the corresponding accounts receivable or cash from the sale. When applying perpetual inventory updating, a second entry would be made at the same time to record the cost of the item based on the AVG costing assumptions, which would be shifted from merchandise inventory (an asset) to cost of goods sold (an expense).



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=207#oembed-1

Long Descriptions

Financial data shows the cost of goods purchased, cost of goods sold, and cost of inventory remaining for July. These transactions occurred for cost of goods purchased: July 10, 225 units purchased at $27 each for a total cost of $6,075. July 25, 210 units purchased at $33 each for a total cost of $6,930. Total purchases in July were $13,005. These transactions occurred for cost of goods sold: July 5, 120 units sold at $21 each for a total cost of $2,520. July 15, 20 units sold at $21 each for a total cost of $420. July 15, 160 units sold at $27 each for a total cost of $4,320. Total cost of goods sold in July were $7,260. These transactions occurred for cost of inventory remaining: July 1, 150 units at $21 for a total of $3,150. July 5, 30 units at $21 for a total of $630. July 10, 30 units at $21 for a total of $360 and 225 units at $27 for a total of $6,075. July 15, 10 units at $21 for a total of $210 and 65 units at $27 for a total of $1,755. July 25 10 units at $21 for a total of $210, 65 units at $27 for a total of $1,755, and 210 units at $33

for a total of $6,930. A second chart shows cost value: 10 units at $21 equals $210, 65 units at $27 equals $1,755 210 units at $33 equals $6,930, for a cost value total of $8,895. Return

Financial data shows the cost of goods purchased, cost of goods sold, and cost of inventory remaining for July. These transactions occurred for cost of goods purchased: July 10, 225 units purchased at $27 each for a total cost of $6,075. July 25, 210 units purchased at $33 each for a total cost of $6,930. Total purchases in July were $13,005. These transactions occurred for cost of goods sold: July 5, 120 units sold at $21 each for a total cost of $2,520. July 15, 30 units sold at $21 each for a total cost of $630. July 15, 150 units sold at $27 each for a total cost of $4,050. Total cost of goods sold in July were $7,200. These transactions occurred for cost of inventory remaining: July 1, 150 units at $21 for a total of $3,150. July 5, 30 units at $21 for a total of $630. July 10, 30 units at $21 for a total of $360 and 225 units at $27 for a total of $6,075. July 15, 75 units at $27 for a total of $2,025. July 25 75 units at $27 for a total of $2,025, and 210 units at $33 for a total of $6,930. A second chart shows cost value: 7 units at $27 equals $2,025, 210 units at $33 equals $6,930, for a cost value total of $8,895. Return

Financial data shows the cost of goods purchased, cost of goods sold, and cost of inventory remaining for July. These transactions occurred for cost of goods purchased: July 10, 225 units purchased at $27 each for a total cost of $6,075. July 25, 210 units purchased at $33 each for a total cost of $6,930. Total purchases in July were $13,005. These transactions occurred for cost of goods sold: July 5, 120 units sold at $21 each for a total cost of $2,520. July 15, 180 units sold at $27 each for a total cost of $4,860. Total cost of goods sold in July were $7,380. These transactions occurred for cost of inventory remaining: July 1, 150 units at $21 for a total of $3,150. July 5, 30 units at $21 for a total of $630. July 10, 30 units at $21 for a total of $630 and 225 units at $27 for a total of $6,075. July 15, 30 units at $21 for a total of $630 and 45 units at $27 for a total of $1,215. July 25 30 units at $21 for

a total of $630, 45 units at $27 for a total of $1,215, and 210 units at $33 for a total of $6,930. A second chart shows cost value: 30 units at $21 equals $630, 45 units at $27 equals $1215, 210 units at $33 equals $6,930, for a cost value total of $8,775. Return

Financial data shows the cost of goods purchased, cost of goods sold, and cost of inventory remaining for July. These transactions occurred for cost of goods purchased: July 10, 225 units purchased at $27 each for a total cost of $6,075. July 25, 210 units purchased at $33 each for a total cost of $6,930. Total purchases in July were $13,005. These transactions occurred for cost of goods sold: July 5, 120 units sold at $21 each for a total cost of $2,520. July 15, 180 units sold at $26.29 each for a total cost of $4,733. Total cost of goods sold in July were $7,253. These transactions occurred for cost of inventory remaining: July 1, 150 units at $21 for a total of $3,150. July 5, 30 units at $21 for a total of $630. July 10, 225 units at $31.24 for a total of $8,902. A second chart shows cost value: 285 units at $31.24 equals $8,902 for a cost value total of $8,902. Return

Footnotes

- 1 Note that there is a $1 rounding difference due to the rounding of cents inherent in the cost determination chain process.

2.9 Comparison of all Four Methods

Comparison of All Four Methods, Perpetual

The outcomes for gross margin, under each of these different cost assumptions, is summarized in Figure 2.101.

	Sp ID	FIFO	LIFO	AVG
Sales Revenue	$11,340	$11,340	$11,340	$11,340
– Cost	7,260	7,200	7,380	7,253
= Gross Margin	4,080	4,140	3,960	4,087

Figure 2.101 Gross Margin Comparison *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

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CHAPTER 3- SHORT-TERM AND LONG-TERM ASSETS

Cash is King!

3.1 Bank Reconciliation

The bank is a very important partner to all businesses. Not only does the bank provide basic checking services, but they process credit card transactions, keep cash safe, and may finance loans when needed.

Bank accounts for businesses can involve thousands of transactions per month. Due to the number of ongoing transactions, an organization's book balance for its checking account rarely is the same as the balance that the bank records reflect for the entity at any given point. These timing differences are typically caused by the fact that there will be some transactions that the organization is aware of before the bank, or transactions the bank is aware of before the company.

For example, if a company writes a check that has not cleared yet, the company would be aware of the transaction before the bank is. Similarly, the bank might have received funds on the company's behalf and recorded them in the bank's records for the company before the organization is aware of the deposit.

With the large volume of transactions that impact a bank account, it becomes necessary to have an internal control system in place to assure that all cash transactions are properly recorded within the bank account, as well as on the ledger of the business. The bank reconciliation is the internal financial report that explains and documents any differences that may exist between the balance of a checking account as reflected by the bank's records (bank balance) for a company and the company's accounting records (company balance).

The bank reconciliation is an internal document prepared by the company that owns the checking account. The transactions with timing differences are used to adjust and reconcile both the bank and company balances; after the bank

reconciliation is prepared accurately, both the bank balance and the company balance will be the same amount.

Note that the transactions the company is aware of have already been recorded (journalized) in its records. However, the transactions that the bank is aware of but the company is not must be journalized in the entity's records.

Fundamentals of the Bank Reconciliation Procedure

The balance on a bank statement can differ from company's financial records due to one or more of the following circumstances:

- An outstanding check: a check that was written and deducted from the financial records of the company but has not been cashed by the recipient, so the amount has not been removed from the bank account.
- A deposit in transit: a deposit that was made by the business and recorded on its books but has not yet been recorded by the bank.
- Deductions for a bank service fee: fees often charged by banks each month for management of the bank account. These may be fixed maintenance fees, per-check fees, or a fee for a check that was written for an amount greater than the balance in the checking account, called an nonsufficient funds (NSF) check. These fees are deducted by the bank from the account but would not appear on the financial records.
- Errors initiated by either the client or the bank: for example, the client might record a check incorrectly in its records, for either a greater or lesser amount than was written. Also, the bank might report a check either with an incorrect balance or in the wrong client's checking

account.

- Additions such as interest or funds collected by the bank for the client: interest is added to the bank account as earned but is not reported on the financial records. These additions might also include funds collected by the bank for the client.

Demonstration of a Bank Reconciliation

A bank reconciliation is structured to include the information shown in Figure 3.1.

COMPANY NAME Bank Reconciliation December 31, 2018			
Bank Statement Balance at 12/31/18	$ XXX	Book Balance at 12/31/18	$ XXX
Deposits in transit	XXX	Income not recorded on books	XXX
Outstanding checks	(XXX)	Bank interest income	XXX
		Expenses not recorded on books	(XXX)
		Bank account charges	(XXX)
Adjusted Bank Balance	$ XXX	Adjusted Book Balance	$ XXX

Figure 3.1 Bank Reconciliation *A bank reconciliation includes categories for adjustments to both the bank balance and the book balance. Bank Reconciliation. By: Rice University. Source: Openstax CC BY-NC-SA 4.0 Long Description*

Assume the following circumstances for Feeter Plumbing Company, a small business located in Northern Ohio.

1. After all posting is up to date, at the end of July 31, the book balance shows $32,760, and the bank statement balance shows $77,040.
2. Check 5523 for $9,620 and 6547 for $10,000 are outstanding.
3. Check 5386 for $2,000 is removed from the bank account correctly but is recorded on the accounting records for $1,760. This was in payment of dues. The effects of this

transaction resulted in an error of $240 that must be deducted from the company's book balance.

4. The July 31 night deposit of $34,300 was delivered to the bank after hours. As a result, the deposit is not on the bank statement, but it is on the financial records.
5. Upon review of the bank statement, an error is uncovered. A check is removed from the account from Feeter for $320 that should have been removed from the account of another customer of the bank.
6. In the bank statement is a note stating that the bank collected $60,000 in charges (payments) from the credit card company as well as $1,800 in interest. This transaction is on the bank statement but not in the company's financial records.
7. The bank notified Feeter that a $2,200 check was returned unpaid from customer Berson due to insufficient funds in Berson's account. This check return is reflected on the bank statement but not in the records of Feeter.
8. Bank service charges for the month are $80. They have not been recorded on Feeter's records.

Each item would be recorded on the bank reconciliation as follows:

FEETER PLUMBING
Bank Reconciliation
July 31, 2018

Bank Statement Balance		$ 77,040	Book Balance		$32,760
Deposit	$ 34,300		Collection of account	$60,000	
Bank error	320	34,620	Interest earned	1,800	61,800
		$111,600			$94,560
Outstanding checks			NSF check	(2,200)	
5523	(9,620)		Recording error	(240)	
6547	(10,000)	(19,620)	Service charge	(80)	(2,520)
Adjusted Bank Balance		$ 92,040			$92,040

Figure 3.2 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

One important trait of the bank reconciliation is that it

identifies transactions that have not been recorded by the company that are supposed to be recorded. Journal entries are required to adjust the book balance to the correct balance.

In the case of Feeter, the first entry will record the collection of the note, as well as the interest collected.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cash Notes Receivable Interest Receivable *To recognize the note that was collected and charged interest expense*	61,800	 60,000 1,800

Figure 3.3 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The second entry required is to adjust the books for the check that was returned from Berson.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Accounts Receivable Cash *To adjust the account for the returned check for insufficient funds*	2,200	 2,200

Figure 3.4 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The third entry is to adjust the recording error for check 5386.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Dues Expense Cash *To adjust for check that was not recorded properly*	240	 240

Figure 3.5 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The final entry is to record the bank service charges that are

deducted by the bank but have not been recorded on the records.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Bank Service Charges	80	
	Cash		80
	To record monthly bank service charges		

Figure 3.6 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The previous entries are standard to ensure that the bank records are matching to the financial records. These entries are necessary to update Feeter's general ledger cash account to reflect the adjustments made by the bank.



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Long Descriptions

Company Name, Bank Reconciliation, December 31, 2018; Bank Statement Balance at 12/31/18 $X X X; plus Deposits in transit X X X; minus Outstanding checks (X X X); Adjusted Bank Balance $X X X. Book Balance at 12/31/18 $X X X; plus Income not recorded on books X X X; plus Bank interest income X X X; minus Expenses not recorded on books (X X X); minus Bank account charges (X X X); Adjusted Book Balance $X X X. Return

Feeter Plumbing, Bank Reconciliation, July 21, 2018; Bank Statement Balance $77,040; Add: Deposit $34,300 and Bank

error 320 minus 34,620, subtotal 111,660; Deduct: Outstanding checks numbered 5523 (9,620) and 6547 (10,000) minus (19,620); Adjusted Bank Balance $92,040; Book Balance $32,760; Add: Collection of account $60,000 and Interest earned 1,800 minus 61,800, subtotal $94,560; Deduct: N S F check (2,200), Recording error (240), and Service charge (80) minus (2,520). Adjusted Book Balance $92,040. Return

3.2 Petty Cash

As we have discussed, one of the hardest assets to control within any organization is cash. One way to control cash is for an organization to require that all payments be made by check. However, there are situations in which it is not practical to use a check. For example, imagine that the Galaxy's Best Yogurt runs out of milk one evening. It is not possible to operate without milk, and the normal shipment does not come from the supplier for another 48 hours. To maintain operations, it becomes necessary to go to the grocery store across the street and purchase three gallons of milk. It is not efficient for time and cost to write a check for this small purchase, so companies set up a petty cash fund, which is a predetermined amount of cash held on hand to be used to make payments for small day-to-day purchases. A petty cash fund is a type of imprest account, which means that it contains a fixed amount of cash that is replaced as it is spent in order to maintain a set balance.

To maintain internal controls, managers can use a petty cash receipt (Figure 3.7), which tracks the use of the cash and requires a signature from the manager.

PETTY CASH RECEIPT

Date: _____ **Approved by:** _____

Receipt number: _____ **Received by:** _____

Description	Amount

Figure 3.7 Petty Cash Voucher *A petty cash voucher is an important internal control document to trace the use of cash within a petty cash fund. This voucher allows management to track the use of cash, the balance that should be within the account, and the person responsible for the approval of a payment from the account. Petty Cash Voucher. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

As cash is spent from a petty cash fund, it is replaced with a receipt of the purchase. At all times, the balance in the petty cash box should be equal to the cash in the box plus the receipts showing purchases.

For example, the Galaxy's Best Yogurt maintains a petty cash box with a stated balance of $75 at all times. Upon review of the box, the balance is counted in the following way.

Cash in box	$50
Receipt showing purchase of stamps from Postal Service	15
Receipt from Quick Market for the purchase of milk and bananas	10
Total balance in petty cash box	75

Figure 3.8 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Because there may not always be a manager with check signing privileges available to sign a check for unexpected expenses, a petty cash account allows employees to make

small and necessary purchases to support the function of a business when it is not practical to go through the formal expense process. In all cases, the amount of the purchase using petty cash would be considered to not be material in nature. Recall that materiality means that the dollar amount in question would have a significant impact in financial results or influence investor decisions.

Demonstration of Typical Petty Cash Journal Entries

Petty cash accounts are managed through a series of journal entries. Entries are needed to (1) establish the fund, (2) increase or decrease the balance of the fund (replenish the fund as cash is used), and (3) adjust for overages and shortages of cash. Consider the following example.

The Galaxy's Best Yogurt establishes a petty cash fund on July 1 by cashing a check for $75 from its checking account and placing cash in the petty cash box. At this point, the petty cash box has $75 to be used for small expenses with the authorization of the responsible manager. The journal entry to establish the petty cash fund would be as follows.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Petty cash	75	
	Cash		75
	To record establishment of petty cash fund		

Figure 3.9 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

As this petty cash fund is established, the account titled "Petty Cash" is created; this is an asset on the balance sheet of many small businesses. In this case, the cash account, which includes checking accounts, is decreased, while the funds are moved to

the petty cash account. One asset is increasing, while another asset is decreasing by the same account. Since the petty cash account is an imprest account, this balance will never change and will remain on the balance sheet at $75, unless management elects to change the petty cash balance.

Throughout the month, several payments are made from the petty cash account of the Galaxy's Best Yogurt. Assume the following activities.

Date	Transaction	Amount
Jul. 10	Postage stamps are purchased	$30
Jul. 15	Milk purchased	10
Jul. 25	Window cleaner purchased from Dollar Store	5

Figure 3.10 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

At the end of July, in the petty cash box there should be a receipt for the postage stamp purchase, a receipt for the milk, a receipt for the window cleaner, and the remaining cash. The employee in charge of the petty cash box should sign each receipt when the purchase is made. The total amount of purchases from the receipts ($45), plus the remaining cash in the box should total $75. As the receipts are reviewed, the box must be replenished for what was spent during the month. The journal entry to replenish the petty cash account will be as follows.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jul. 31	Postage Expense	30	
	Inventory	10	
	Miscellaneous Expense	5	
	Cash		45
	To record replenishment of petty cash fund		

Figure 3.11 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Typically, petty cash accounts are reimbursed at a fixed time period. Many small businesses will do this monthly, which ensures that the expenses are recognized within the proper accounting period. In the event that all of the cash in the account is used before the end of the established time period, it can be replenished in the same way at any time more cash is needed. If the petty cash account often needs to be replenished before the end of the accounting period, management may decide to increase the cash balance in the account. If, for example, management of the Galaxy's Best Yogurt decides to increase the petty cash balance to $100 from the current balance of $75, the journal entry to do this on August 1 would be as follows.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 1	Petty Cash	25	
	Cash		25
	To increase balance of petty cash fund to $100		

Figure 3.12 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

If the management at a later date decides to decrease the balance in the petty cash account, the previous entry would be reversed, with cash being debited and petty cash being credited.

Occasionally, errors may occur that affect the balance of the petty cash account. This may be the result of an employee not getting a receipt or getting back incorrect change from the store where the purchase was made. In this case, an expense is created that creates a *cash overage or shortage*.

Consider Galaxy's expenses for July. During the month, $45 was spent on expenses. If the balance in the petty cash account is supposed to be $75, then the petty cash box should contain $45 in signed receipts and $30 in cash. Assume that when the box is counted, there are $45 in receipts and $25 in cash. In

this case, the petty cash balance is $70, when it should be $75. This creates a $5 shortage that needs to be replaced from the checking account. The entry to record a cash shortage is as follows.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jul. 30	Cash Over and Short	5	
	Cash		5
	To replenish petty cash balance for cash shortage during period		

Figure 3.13 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

When there is a shortage of cash, we record the shortage as a "debit" and this has the same effect as an expense. If we have an overage of cash, we record the overage as a credit, and this has the same impact as if we are recording revenue. If there were cash overage, the petty cash account would be debited and the cash over and short account would be credited. In this case, the expense balance decreases, and the year-end balance is the net balance from all overages and shortages during the year.

If a petty cash account is consistently short, this may be a warning sign that there is not a proper control of the account, and management may want to consider additional controls to better monitor petty cash.



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3.3 Bad Debt Expense and the Allowance for Doubtful Accounts

You lend a friend $500 with the agreement that you will be repaid in two months. At the end of two months, your friend has not repaid the money. You continue to request the money each month, but the friend has yet to repay the debt. How does this affect your finances?

Think of this on a larger scale. A bank lends money to a couple purchasing a home (mortgage). The understanding is that the couple will make payments each month toward the principal borrowed, plus interest. As time passes, the loan goes unpaid. What happens when a loan that was supposed to be paid is not paid? How does this affect the financial statements for the bank? The bank may need to consider ways to recognize this bad debt.

Fundamentals of Bad Debt Expenses and Allowances for Doubtful Accounts

Bad debts are uncollectible amounts from customer accounts. Bad debt negatively affects accounts receivable (see Figure 3.22). When future collection of receivables cannot be reasonably assumed, recognizing this potential nonpayment is required. There are two methods a company may use to recognize bad debt: the direct write-off method and the allowance method.

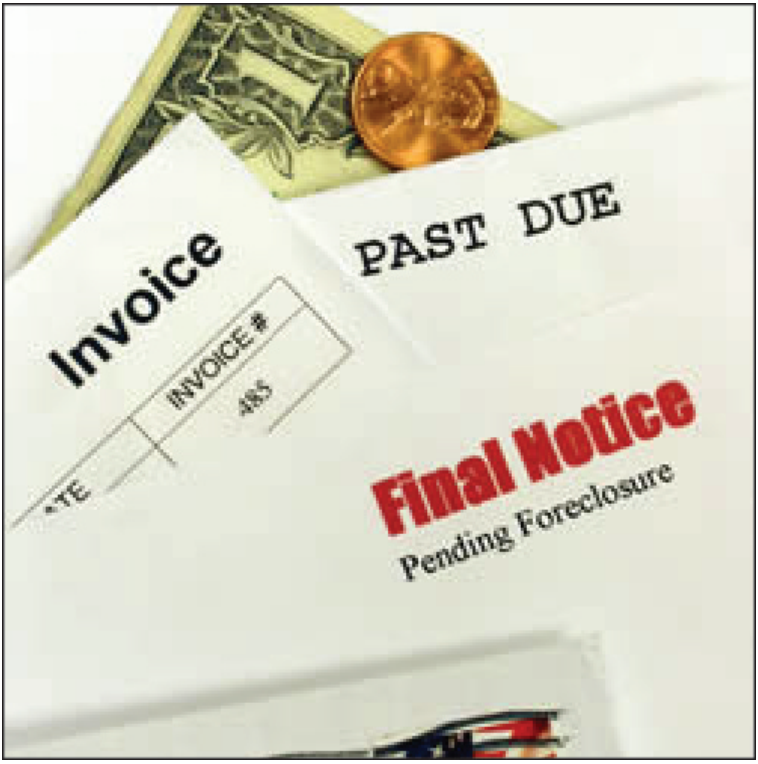


Figure 3.22 Bad Debt Expenses *Uncollectible customer accounts produce bad debt. Bad Debt Expenses. By: maggiebug 21 Source: wikimedia commons CC BY-NC-SA*

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The direct write-off method delays recognition of bad debt

until the specific customer accounts receivable is identified. Once this account is identified as uncollectible, the company will record a reduction to the customer's accounts receivable and an increase to bad debt expense for the exact amount uncollectible.

Under generally accepted accounting principles (GAAP), the direct write-off method is not an acceptable method of recording bad debts, because it violates the matching principle. For example, assume that a credit transaction occurs in September 2018 and is determined to be uncollectible in February 2019. The direct write-off method would record the bad debt expense in 2019, while the matching principle requires that it be associated with a 2018 transaction, which will better reflect the relationship between revenues and the accompanying expenses. This matching issue is the reason accountants will typically use one of the two accrual-based accounting methods introduced to account for bad debt expenses.

It is important to consider other issues in the treatment of bad debts. For example, when companies account for bad debt expenses in their financial statements, they will use an accrual-based method; however, they are required to use the direct write-off method on their income tax returns. This variance in treatment addresses taxpayers' potential to manipulate when a bad debt is recognized. Because of this potential manipulation, the Internal Revenue Service (IRS) requires that the direct write-off method must be used when the debt is determined to be uncollectible, while GAAP still requires that an accrual-based method be used for financial accounting statements.

For the taxpayer, this means that if a company sells an item on credit in October 2018 and determines that it is uncollectible in June 2019, it must show the effects of the bad debt when it files its 2019 tax return. This application probably violates the matching principle, but if the IRS did not have this policy, there

would typically be a significant amount of manipulation on company tax returns. For example, if the company wanted the deduction for the write-off in 2018, it might claim that it was actually uncollectible in 2018, instead of in 2019.

The final point relates to companies with very little exposure to the possibility of bad debts, typically, entities that rarely offer credit to its customers. Assuming that credit is not a significant component of its sales, these sellers can also use the direct write-off method. The companies that qualify for this exemption, however, are typically small and not major participants in the credit market. Thus, virtually all of the remaining bad debt expense material discussed here will be based on an allowance method that uses accrual accounting, the matching principle, and the revenue recognition rules under GAAP.

For example, a customer takes out a $15,000 car loan on August 1, 2018 and is expected to pay the amount in full before December 1, 2018. For the sake of this example, assume that there was no interest charged to the buyer because of the short-term nature or life of the loan. When the account defaults for nonpayment on December 1, the company would record the following journal entry to recognize bad debt.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 1	Bad Debt Expense	15,000	
	Accounts Receivable		15,000
	To record bad debts		

Figure 3.23 *By: Rice University Source: Openstax CC BY-NC-SA*

Bad Debt Expense increases (debit), and Accounts Receivable decreases (credit) for $15,000. If, in the future, any part of the debt is recovered, a reversal of the previously written-off bad debt, and the collection recognition is required. Let's say this customer unexpectedly pays in full on May 1, 2019, the company

would record the following journal entries (note that the company's fiscal year ends on June 30)

JOURNAL			
Date	**Account**	**Debit**	**Credit**
May 1, 2019	Accounts Receivable	15,000	
	Bad Debt Expense		15,000
	To reverse previous bad debt write-off		
May 1, 2019	Cash	15,000	
	Accounts Receivable		15,000
	To record payment on account		

Figure 3.24 *By: Rice University Source: Openstax CC BY-NC-SA*

The first entry reverses the bad debt write-off by increasing Accounts Receivable (debit) and decreasing Bad Debt Expense (credit) for the amount recovered. The second entry records the payment in full with Cash increasing (debit) and Accounts Receivable decreasing (credit) for the amount received of $15,000.

As you've learned, the delayed recognition of bad debt violates GAAP, specifically the matching principle. Therefore, the direct write-off method is not used for publicly traded company reporting; the allowance method is used instead.



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The allowance method is the more widely used method because it satisfies the matching principle. The allowance method estimates bad debt during a period, based on certain computational approaches. The calculation matches bad debt with related sales during the period. The estimation is made

from past experience and industry standards. When the estimation is recorded at the end of a period, the following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Bad Debt Expense	$$$	
	Allowance for Doubtful Accounts		$$$
	To record estimated bad debt		

$, *Credit Allowance for Doubtful Accounts*

$. Explanation: “To record estimated bad debt.”” width=”1299" height=”216" data-media-type=”image/jpeg” /> **Figure 3.25** By: Rice University Source: Openstax CC BY-NC-SA

The journal entry for the Bad Debt Expense increases (debit) the expense’s balance, and the Allowance for Doubtful Accounts increases (credit) the balance in the Allowance. The allowance for doubtful accounts is a contra asset account and is subtracted from Accounts Receivable to determine the Net Realizable Value of the Accounts Receivable account on the balance sheet. A contra account has an opposite normal balance to its paired account, thereby reducing or increasing the balance in the paired account at the end of a period; the adjustment can be an addition or a subtraction from a controlling account. In the case of the allowance for doubtful accounts, it is a contra account that is used to reduce the Controlling account, Accounts Receivable.

At the end of an accounting period, the Allowance for Doubtful Accounts reduces the Accounts Receivable to produce Net Accounts Receivable. Note that allowance for doubtful accounts reduces the overall accounts receivable account, not a specific accounts receivable assigned to a customer. Because it is an estimation, it means the exact account that is (or will become) uncollectible is not yet known.

To demonstrate the treatment of the allowance for doubtful

accounts on the balance sheet, assume that a company has reported an Accounts Receivable balance of $90,000 and a Balance in the Allowance of Doubtful Accounts of $4,800. The following table reflects how the relationship would be reflected in the current (short-term) section of the company's Balance Sheet.

Accounts Receivable	$90,000	
– Allowance for Doubtful Accounts	($4,800)	$85,200

Figure 3.26 *By: Rice University Source: Openstax CC BY-NC-SA*

There is one more point about the use of the contra account, Allowance for Doubtful Accounts. In this example, the $85,200 total is the net realizable value, or the amount of accounts anticipated to be collected. However, the company is owed $90,000 and will still try to collect the entire $90,000 and not just the $85,200.

Under the balance sheet method of calculating bad debt expenses, if there is already a balance in Allowance for Doubtful Accounts from a previous period and accounts written off in the current year, this must be considered before the adjusting entry is made. For example, if a company already had a credit balance from the prior period of $1,000, plus any accounts that have been written off this year, and a current period estimated balance of $2,500, the company would need to subtract the prior period's credit balance from the current period's estimated credit balance in order to calculate the amount to be added to the Allowance for Doubtful Accounts.

Current period	= $2,500 credit
Prior period	= $1,000 credit
Allowance for Doubtful Accounts	= $1,500 credit

Figure 3.27 *By: Rice University Source: Openstax CC BY-NC-SA*

Therefore, the adjusting journal entry would be as follows.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Bad Debt Expense	1,500	
	Allowance for Doubtful Accounts		1,500
	To record estimated bad debt		

Figure 3.28 *By: Rice University Source: Openstax CC BY-NC-SA*

If a company already had a debit balance from the prior period of $1,000, and a current period estimated balance of $2,500, the company would need to add the prior period's debit balance to the current period's estimated credit balance.

Current period	= $2,500 credit
Prior period	= $1,000 debit
Allowance for Doubtful Accounts	= $3,500 credit

Figure 3.29 *By: Rice University Source: Openstax CC BY-NC-SA*

Therefore, the adjusting journal entry would be as follows.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Bad Debt Expense Allowance for Doubtful Accounts *To record estimated bad debt*	3,500	3,500

Figure 3.30 *By: Rice University Source: Openstax CC BY-NC-SA*

When a specific customer has been identified as an uncollectible account, the following journal entry would occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Allowance for Doubtful Accounts Accounts Receivable: Customer *To record bad debt for specific customer*	$$$	$$$

$, credit Accounts Receivable : Customer

$. Explanation: "To record bad debt for specific customer."" width="1299" height="216" data-media-type="image/jpeg" /> ***Figure 3.31*** *By: Rice University Source: Openstax CC BY-NC-SA*

Allowance for Doubtful Accounts decreases (debit) and Accounts Receivable for the specific customer also decreases (credit). Allowance for doubtful accounts decreases because the bad debt amount is no longer unclear. Accounts receivable decreases because there is an assumption that no debt will be collected on the identified customer's account.

Let's say that the customer unexpectedly pays on the account in the future. The following journal entries would occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Accounts Receivable: Customer	$$$	
	Allowance for Doubtful Accounts		$$$
	To reinstate previously written-off bad debt		
	Cash	$$$	
	Accounts Receivable: Customer		$$$
	To record bad debt for specific customer		

$, *credit Allowance for Doubtful Accounts*

$. Explanation: "To reinstate previously written-off bad debit." Debit Cash

$, *credit Accounts Receivable : Customer*

$. Explanation: "To record bad debt for specific customer."" width="1299" height="321" data-media-type="image/jpeg" /> ***Figure 3.32*** *By: Rice University Source: Openstax CC BY-NC-SA*

The first entry reverses the previous entry where bad debt was written off. This reinstatement requires Accounts Receivable: Customer to increase (debit), and Allowance for Doubtful Accounts to increase (credit). The second entry records the payment on the account. Cash increases (debit) and Accounts Receivable: Customer decreases (credit) for the amount received.

To compute the most accurate estimation possible, a company may use one of three methods for bad debt expense recognition: the income statement method, balance sheet method, or balance sheet aging of receivables method.

Income Statement Method for Calculating Bad Debt Expenses

The income statement method (also known as the percentage of sales method) estimates bad debt expenses based on the assumption that at the end of the period, a certain percentage of sales during the period will not be collected. The estimation

is typically based on credit sales only, not total sales (which include cash sales). In this example, assume that any credit card sales that are uncollectible are the responsibility of the credit card company. It may be obvious intuitively, but, by definition, a cash sale cannot become a bad debt, assuming that the cash payment did not entail counterfeit currency. The income statement method is a simple method for calculating bad debt, but it may be more imprecise than other measures because it does not consider how long a debt has been outstanding and the role that plays in debt recovery.

To illustrate, let's continue to use Billie's Watercraft Warehouse (BWW) as the example. Billie's end-of-year credit sales totaled $458,230. BWW estimates that 5% of its overall credit sales will result in bad debt. The following adjusting journal entry for bad debt occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Bad Debt Expense	22,911.50	
	Allowance for Doubtful Accounts		22,911.50
	To record estimated bad debts, income statement method		

Figure 3.33 *By: Rice University Source: Openstax CC BY-NC-SA*

Bad Debt Expense increases (debit), and Allowance for Doubtful Accounts increases (credit) for $22,911.50 ($458,230 × 5%). This means that BWW believes $22,911.50 will be uncollectible debt. Let's say that on April 8, it was determined that Customer Robert Craft's account was uncollectible in the amount of $5,000. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 8	Allowance for Doubtful Accounts	5,000	
	Accounts Receivable: Craft		5,000
	To record known bad debt		

Figure 3.34 *By: Rice University Source: Openstax CC BY-NC-SA*

In this case, Allowance for Doubtful Accounts decreases (debit) and Accounts Receivable: Craft decreases (credit) for the known uncollectible amount of $5,000. On June 5, Craft unexpectedly makes a partial payment on his account in the amount of $3,000. The following journal entries show the reinstatement of bad debt and the subsequent payment.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jun. 5	Accounts Receivable: Craft	3,000	
	Allowance for Doubtful Accounts		3,000
	To reinstate previously written-off bad debt		
Jun. 5	Cash	3,000	
	Accounts Receivable: Craft		3,000
	To record bad debt for specific customer		

Figure 3.35 *By: Rice University Source: Openstax CC BY-NC-SA*

The outstanding balance of $2,000 that Craft did not repay will remain as bad debt.

Income Statement Approach: Percentage of Sales



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YOUR TURN

Heating and Air Company

You run a successful heating and air conditioning company.

Your net credit sales, accounts receivable, and allowance for doubtful accounts figures for year-end 2018, follow.

Net credit sales	$831,400
Accounts receivable	222,850
Allowance for doubtful accounts	0

Figure 3.36 *By: Rice University Source: Openstax CC BY-NC-SA*

A. Compute bad debt estimation using the income statement method, where the percentage uncollectible is 5%.
B. Prepare the journal entry for the income statement method of bad debt estimation.
C. Compute bad debt estimation using the balance sheet method of percentage of receivables, where the percentage uncollectible is 9%.
D. Prepare the journal entry for the balance sheet method bad debt estimation.

Solution

A. $41,570; $831,400 × 5%
B.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Bad Debt Expense	41,570	
	Allowance for Doubtful Accounts		41,570
	To record estimated bad debts, income statement method		

Figure 3.37 *By: Rice University Source: Openstax CC BY-NC-SA*

C. $20,056.50; $222,850 × 9%
D.

Date	Account	Debit	Credit
Dec. 31	Bad Debt Expense Allowance for Doubtful Accounts *To record estimated bad debts, balance sheet method*	20,056.50	20,056.50

Figure 3.38 *By: Rice University Source: Openstax CC BY-NC-SA*

Balance Sheet Method for Calculating Bad Debt Expenses

The balance sheet method (also known as the percentage of accounts receivable method) estimates bad debt expenses based on the balance in accounts receivable. The method looks at the balance of accounts receivable at the end of the period and assumes that a certain amount will not be collected. Accounts receivable is reported on the balance sheet; thus, it is called the balance sheet method. The balance sheet method is another simple method for calculating bad debt, but it too does not consider how long a debt has been outstanding and the role that plays in debt recovery. There is a variation on the balance sheet method, however, called the aging method that does consider how long accounts receivable have been owed, and it assigns a greater potential for default to those debts that have been owed for the longest period of time.

Continuing our examination of the balance sheet method, assume that BWW's end-of-year accounts receivable balance totaled $324,850. This entry assumes a zero balance in Allowance for Doubtful Accounts from the prior period. BWW estimates 15% of its overall accounts receivable will result in bad debt. The following adjusting journal entry for bad debt occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Bad Debt Expense	48,727.50	
	Allowance for Doubtful Accounts		48,727.50
	To record estimated bad debts, balance sheet method		

Figure 3.39 *By: Rice University Source: Openstax CC BY-NC-SA*

Bad Debt Expense increases (debit), and Allowance for Doubtful Accounts increases (credit) for $48,727.50 ($324,850 × 15%). This means that BWW believes $48,727.50 will be uncollectible debt. Let's consider that BWW had a $23,000 credit balance from the previous period. The adjusting journal entry would recognize the following.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Bad Debt Expense	25,727.50	
	Allowance for Doubtful Accounts		25,727.50
	To record estimated bad debts, balance sheet method		

Figure 3.40 *By: Rice University Source: Openstax CC BY-NC-SA*

This is different from the last journal entry, where bad debt was estimated at $48,727.50. That journal entry assumed a zero balance in Allowance for Doubtful Accounts from the prior period. This journal entry takes into account a credit balance of $23,000 and subtracts the prior period's balance from the estimated balance in the current period of $48,727.50.

Current period	= $48,727.50 credit
Prior period	= $23,000.00 credit
Allowance for Doubtful Accounts	= $25,727.50 credit

Figure 3.41 *By: Rice University Source: Openstax CC BY-NC-SA*

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Balance Sheet Aging of Receivables Method for Calculating Bad Debt Expenses

The balance sheet aging of receivables method estimates bad debt expenses based on the balance in accounts receivable, but it also considers the uncollectible time period for each account. The longer the time passes with a receivable unpaid, the lower the probability that it will get collected. An account that is 90 days overdue is more likely to be unpaid than an account that is 30 days past due.

With this method, accounts receivable is organized into categories by length of time outstanding, and an uncollectible percentage is assigned to each category. The length of uncollectible time increases the percentage assigned. For example, a category might consist of accounts receivable that is 0–30 days past due and is assigned an uncollectible percentage of 6%. Another category might be 31–60 days past due and is assigned an uncollectible percentage of 15%. All categories of estimated uncollectible amounts are summed to get a total estimated uncollectible balance. That total is reported in Bad Debt Expense and Allowance for Doubtful Accounts, if there is no carryover balance from a prior period. If there is a carryover balance, that must be considered before recording Bad Debt Expense. The balance sheet aging of receivables method is more complicated than the other two

methods, but it tends to produce more accurate results. This is because it considers the amount of time that accounts receivable has been owed, and it assumes that the longer the time owed, the greater the possibility that individual accounts receivable will prove to be uncollectible.

Looking at BWW, it has an accounts receivable balance of $324,850 at the end of the year. The company splits its past-due accounts into three categories: 0–30 days past due, 31–90 days past due, and over 90 days past due. The uncollectible percentages and the accounts receivable breakdown are shown here.

Past-Due Category	Accounts Receivable Total	Uncollectible Percentage	Total
0–30 days	$145,740	10%	$14,574
31–90 days	102,100	20%	20,420
Over 90 days	77,010	30%	23,103
		Total Estimated Uncollectible:	**$58,097**

Figure 3.42 *By: Rice University Source: Openstax CC BY-NC-SA*

For each of the individual categories, the accountant multiplies the uncollectible percentage by the accounts receivable total for that category to get the total balance of estimated accounts that will prove to be uncollectible for that category. Then all of the category estimates are added together to get one total estimated uncollectible balance for the period. The entry for bad debt would be as follows, if there was no carryover balance from the prior period.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Bad Debt Expense	58,097	
	Allowance for Doubtful Accounts		58,097
	To record estimated bad debts, balance sheet aging method		

Figure 3.43 *By: Rice University Source: Openstax CC BY-NC-SA*

Bad Debt Expense increases (debit) as does Allowance for Doubtful Accounts (credit) for $58,097. BWW believes that $58,097 will be uncollectible debt.

Let's consider a situation where BWW had a $20,000 debit balance from the previous period. The adjusting journal entry would recognize the following.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Bad Debt Expense	78,097	
	Allowance for Doubtful Accounts		78,097
	To record estimated bad debts, balance sheet aging method		

Figure 3.44 *By: Rice University Source: Openstax CC BY-NC-SA*

This is different from the last journal entry, where bad debt was estimated at $58,097. That journal entry assumed a zero balance in Allowance for Doubtful Accounts from the prior period. This journal entry takes into account a debit balance of $20,000 and adds the prior period's balance to the estimated balance of $58,097 in the current period.

Current period	= $58,097 credit
Prior period	= $20,000 debit
Allowance for Doubtful Accounts	= $78,097 credit

Figure 3.45 *By: Rice University Source: Openstax CC BY-NC-SA*

You may notice that all three methods use the same accounts for the adjusting entry; only the method changes the financial outcome. Also note that it is a requirement that the estimation method be disclosed in the notes of financial statements so stakeholders can make informed decisions.



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CONCEPTS IN PRACTICE

Generally Accepted Accounting Principles

As of January 1, 2018, GAAP requires a change in how health-care entities record bad debt expense. Before this change, these entities would record revenues for billed services, even if they did not expect to collect any payment from the patient. This uncollectible amount would then be reported in Bad Debt Expense. Under the new guidance, the bad debt amount may only be recorded if there is an unexpected circumstance that prevented the patient from paying the bill, and it may only be calculated from the amount that the providing entity anticipated collecting.

For example, a patient receives medical services at a local hospital that cost $1,000. The hospital knows in advance that the patient will pay only $100 of the amount owed. The previous GAAP rules would allow the company to write off $900 to bad debt. Under the current rule, the company may only consider revenue to be the expected amount of $100. For example, if the patient ran into an unexpected job loss and is able to pay only $20 of the $100 expected, the hospital would record the $20 to revenue and the $80 ($100 – $20) as a write-off to bad debt. This is a significant change in revenue reporting and bad

debt expense. Health-care entities will more than likely see a decrease in bad debt expense and revenues as a result of this change.[1]

Footnotes

- 1 Tara Bannow. "New Bad Debt Accounting Standards Likely to Remake Community Benefit Reporting." *Modern Healthcare*. March 17, 2018. http://www.modernhealthcare.com/article/20180317/NEWS/180319904

3.4 Bad Debts & the Allowance- Comprehensive Example

The following comprehensive example will illustrate the bad debt estimation process from the sales transaction to adjusting entry reporting for all three bad debt estimation methods: income statement, balance sheet, and balance sheet aging of receivables.

Furniture Direct sells office furniture to large scale businesses. Because the purchases are typically large, Furniture Direct allows customers to pay on credit using an in-house account. At the end of the year, Furniture Direct must estimate bad debt using one of the three estimation methods. It is currently using the income statement method and estimates bad debt at 5% of credit sales. If it were to switch to the balance sheet method, it would estimate bad debt at 8% of accounts receivable. If it were to use the balance sheet aging of receivables method, it would split its receivables into three categories: 0–30 days past due at 5%, 31–90 days past due at 10%, and over 90 days past due at 20%. There is currently a zero balance, transferred from the prior year's Allowance for Doubtful Accounts. The following information is available from the year-end income statement and balance sheet.

2018 Year-end Totals for Furniture Direct	
Credit sales	$1,350,000
Accounts receivable	745,000

Figure 3.46 *By: Rice University Source: Openstax CC BY-NC-SA*

There is also additional information regarding the distribution of accounts receivable by age.

Past-Due Category	Accounts Receivable Total
0–30 days	$485,000
31–90 days	180,000
Over 90 days	80,000

Figure 3.47 *By: Rice University Source: Openstax CC BY-NC-SA*

If the company were to maintain the income statement method, the total bad debt estimation would be $67,500 ($1,350,000 × 5%), and the following adjusting entry would occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Bad Debt Expense	67,500	
	Allowance for Doubtful Accounts		67,500
	To record estimated bad debts, income statement method		

Figure 3.48 *By: Rice University Source: Openstax CC BY-NC-SA*

If the company were to use the balance sheet method, the total bad debt estimation would be $59,600 ($745,000 × 8%), and the following adjusting entry would occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Bad Debt Expense	59,600	
	Allowance for Doubtful Accounts		59,600
	To record estimated bad debts, balance sheet method		

Figure 3.49 *By: Rice University Source: Openstax CC BY-NC-SA*

If the company were to use the balance sheet aging of receivables method, the total bad debt estimation would be $58,250, calculated as shown:

Past Due Category	Accounts Receivable Total	Uncollectible Percentage	Total
0–30 days	$485,000	5%	$24,250
31–90 days	180,000	10%	18,000
Over 90 days	80,000	20%	16,000
		Total Estimated Uncollectible:	**$58,250**

Figure 3.50 *By: Rice University Source: Openstax CC BY-NC-SA*

The adjusting entry recorded using the aging method is as follows.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Bad Debt Expense	58,250	
	Allowance for Doubtful Accounts		58,250
	To record estimated bad debts, balance sheet aging method		

Figure 3.51 *By: Rice University Source: Openstax CC BY-NC-SA*

As you can see, the methods provide different financial figures.

Bad Debt Estimation Method Comparison for Furniture Direct	
	Total Bad Debt Estimation
Income Statement Method	$67,500
Balance Sheet Method	59,600
Balance Sheet Aging of Receivables Method	58,250

Figure 3.52 *By: Rice University Source: Openstax CC BY-NC-SA*

While it is up to the company to determine which method best describes its financial position, a company may manage these methods and figures to present the best financial position possible.

3.5 Notes Receivable

So far, our discussion of receivables has focused solely on accounts receivable. Companies, however, can expand their business models to include more than one type of receivable. This receivable expansion allows a company to attract a more diverse clientele and increase asset potential to further grow the business.

As you've learned, accounts receivable is typically a more informal arrangement between a company and customer that is resolved within a year and does not include interest payments. In contrast, notes receivable (an asset) is a more formal legal contract between the buyer and the company, which requires a specific payment amount at a predetermined future date. The length of contract is typically over a year, or beyond one operating cycle. There is also generally an interest requirement because the financial loan amount may be larger than accounts receivable, and the length of contract is possibly longer. A note can be requested or extended in exchange for products and services or in exchange for cash (usually in the case of a financial lender). Several characteristics of notes receivable further define the contract elements and scope of use.

Table 3.3 Accounts and Notes Receivable By: Rice University
OpenStax CC BY-NC-SA 4.0

Accounts Receivable	Notes Receivable
• An informal agreement between customer and company • Receivable in less than one year or within a company's operating cycle • Does not include interest	• A legal contract with established payment terms • Receivable beyond one year and outside of a company's operating cycle • Includes interest

Characteristics of Notes Receivable

Notes receivable have several defining characteristics that include principal, length of contract terms, and interest. The principal of a note is the initial loan amount, not including interest, requested by the customer. If a customer approaches a lender, requesting $2,000, this amount is the principal. The date on which the security agreement is initially established is the issue date. A note's maturity date is the date at which the principal and interest become due and payable. The maturity date is established in the initial note contract. For example, when the previously mentioned customer requested the $2,000 loan on January 1, 2018, terms of repayment included a maturity date of 24 months. This means that the loan will mature in two years, and the principal and interest are due at that time. The following journal entries occur at the note's established start date. The first entry shows a note receivable in exchange for a product or service, and the second entry illustrates the note from the point of view that a $2,000 loan was issued by a financial institution to a customer (borrower).

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2018	Notes Receivable Sales Revenue *To record sale in exchange for notes receivable*	2,000	2,000

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2018	Notes Receivable Cash *To record notes receivable in exchange for a cash loan*	2,000	2,000

Figure 3.58 *By: Rice University Source: Openstax CC BY-NC-SA*

Before realization of the maturity date, the note is accumulating interest revenue for the lender. Interest is a

monetary incentive to the lender that justifies loan risk. An annual interest rate is established with the loan terms. The interest rate is the part of a loan charged to the borrower, expressed as an annual percentage of the outstanding loan amount. Interest is accrued daily, and this accumulation must be recorded periodically (each month for example). The Revenue Recognition Principle requires that the interest revenue accrued is recorded in the period when earned. Periodic interest accrued is recorded in Interest Revenue and Interest Receivable. To calculate interest, the company can use the following formulas. The following example uses months but the calculation could also be based on a 365-day year.

$$\text{Interest} = \text{Annual Interest Rate} \times \text{Loan Principle} \times \text{Part of Year}$$

where

$$\text{Part of Year} = \frac{\text{Number of Accrued Interest Months}}{\text{12 Months}}$$

Figure 3.59 *By: Rice University Source: Openstax CC BY-NC-SA*

Another common way to state the interest formula is Interest = Principal × Rate × Time. From the previous example, the company offered a $2,000 note with a maturity date of 24 months. The annual interest rate on the loan is 10%. Each period the company needs to record an entry for accumulated interest during the period. In this example, the first year's interest revenue accumulation is computed as 10% × $2,000 × (12 ÷ 12) = $200. The $200 is recognized in Interest Revenue and Interest Receivable.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2018	Interest Receivable	200	
	Interest Revenue		200
	To record interest accumulated after first 12 months		

Figure 3.60 *By: Rice University Source: Openstax CC BY-NC-SA*

When interest is due at the end of the note (24 months), the company may record the collection of the loan principal and the accumulated interest. These transactions can be recorded as one entry or two. The first set of entries show collection of principal, followed by collection of the interest.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Cash	2,000	
	Notes Receivable		2,000
	To record collection of note principal		
Dec. 31, 2019	Cash	400	
	Interest Receivable		200
	Interest Revenue		200
	To record interest collection after 24-month term		

Figure 3.61 *By: Rice University Source: Openstax CC BY-NC-SA*

Interest revenue from year one had already been recorded in 2018, but the interest revenue from 2019 is not recorded until the end of the note term. Thus, Interest Revenue is increasing (credit) by $200, the remaining revenue earned but not yet recognized. Interest Receivable decreasing (credit) reflects the 2018 interest owed from the customer that is paid to the company at the end of 2019. The second possibility is one entry recognizing principal and interest collection.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Cash	2,400	
	Notes Receivable		2,000
	Interest Receivable		200
	Interest Revenue		200
	To record collection of principal and accumulated interest		

Figure 3.62 *By: Rice University Source: Openstax CC BY-NC-SA*

If the note term does not exceed one accounting period, the entry showing note collection may not reflect interest receivable. For example, let's say the company's note maturity date was 12 months instead of 24 (payment in full occurs

December 31, 2018). The entry to record collection of the principal and interest follows.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2018	Cash	2,200	
	Notes Receivable		2,000
	Interest Revenue		200
	To record collection of principle and interest		

Figure 3.63 *By: Rice University Source: Openstax CC BY-NC-SA*



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The examples provided account for collection of the note in full on the maturity date, which is considered an honored note. But what if the customer does not pay within the specified contract length? This situation is considered a dishonored note. A lender will still pursue collection of the note but will not maintain a long-term receivable on its books. Instead, the lender will convert the notes receivable and interest due into an account receivable. Sometimes a company will classify and label the uncollected account as a Dishonored Note Receivable. Using our example, if the company was unable to collect the $2,000 from the customer at the 12-month maturity date, the following entry would occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2018	Accounts Receivable Notes Receivable Interest Revenue *To record conversion of note to Accounts Receivable*	2,200	 2,000 200

Figure 3.64 *By: Rice University Source: Openstax CC BY-NC-SA*

If it is still unable to collect, the company may consider selling the receivable to a collection agency. When this occurs, the collection agency pays the company a fraction of the note's value, and the company would write off any difference as a factoring (third-party debt collection) expense. Let's say that our example company turned over the $2,200 accounts receivable to a collection agency on March 5, 2019 and received only $500 for its value. The difference between $2,200 and $500 of $1,700 is the factoring expense.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Mar. 5, 2019	Cash Factoring Expense Accounts Receivable *To record sale of Accounts Receivable to third-party factor*	500 1,700	 2,200

Figure 3.65 *By: Rice University Source: Openstax CC BY-NC-SA*

Notes receivable can convert to accounts receivable, as illustrated, but accounts receivable can also convert to notes receivable. The transition from accounts receivable to notes receivable can occur when a customer misses a payment on a short-term credit line for products or services. In this case, the company could extend the payment period and require interest.

For example, a company may have an outstanding account receivable in the amount of $1,000. The customer negotiates with the company on June 1 for a six-month note maturity date,

12% annual interest rate, and $250 cash up front. The company records the following entry at contract establishment.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jun. 1	Cash	250	
	Notes Receivable	750	
	Accounts Receivable		1,000
	To record conversion of Accounts Receivable to Notes Receivable		

Figure 3.66 *By: Rice University Source: Openstax CC BY-NC-SA*



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Illustrated Examples of Notes Receivable

To illustrate notes receivable scenarios, let's return to Billie's Watercraft Warehouse (BWW) as the example. BWW has a customer, Waterways Corporation, that tends to have larger purchases that require an extended payment period. On January 1, 2018, Waterways purchased merchandise in the amount of $250,000. BWW agreed to lend the $250,000 purchase cost (sales price) to Waterways under the following conditions. First, BWW agrees to accept a note payable issued by Waterways. The conditions of the note are that the principal amount is $250,000, the maturity date on the note is 24 months, and the annual interest rate is 12%. On January 1, 2018, BWW records the following entry.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2018	Notes Receivable: Waterways Sales Revenue *To record sale in exchange for notes receivable, 24-month maturity, 12% interest rate*	250,000	250,000

Figure 3.67 *By: Rice University Source: Openstax CC BY-NC-SA*

Notes Receivable: Waterways increases (debit), and Sales Revenue increases (credit) for the principal amount of $250,000. On December 31, 2018, BWW records interest accumulated on the note for 12 months.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2018	Interest Receivable: Waterways Interest Revenue *To record interest accumulated after first 12 months*	30,000	30,000

Figure 3.68 *By: Rice University Source: Openstax CC BY-NC-SA*

Interest Receivable: Waterways increases (debit) as does Interest Revenue (credit) for 12 months of interest computed as $250,000 × 12% × (12 ÷ 12). On December 31, 2019, Waterways Corporation honors the note; BWW records this collection as a single entry.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Cash Notes Receivable: Waterways Interest Receivable: Waterways Interest Revenue *To record collection of principal and accumulated interest*	310,000	 250,000 30,000 30,000

Figure 3.69 *By: Rice University Source: Openstax CC BY-NC-SA*

Cash increases (debit) for the principal and interest total of $310,000, Notes Receivable: Waterways decreases (credit) for

the principal amount of $250,000, Interest Receivable: Waterways decreases (credit) for the 2018 accumulated interest amount of $30,000, and Interest Revenue increases (credit) for the 2019 interest collection amount of $30,000.

BWW does business with Sea Ferries Inc. BWW issued Sea Ferries a note in the amount of $100,000 on January 1, 2018, with a maturity date of six months, at a 10% annual interest rate. On July 2, BWW determined that Sea Ferries dishonored its note and recorded the following entry to convert this debt into accounts receivable.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jun. 2, 2018	Accounts Receivable: Sea Ferries	105,000	
	Notes Receivable: Sea Ferries		100,000
	Interest Revenue		5,000
	To record conversion of note to Accounts Receivable, dishonored note		

Figure 3.70 *By: Rice University Source: Openstax CC BY-NC-SA*

Accounts Receivable: Sea Ferries increases (debit) for the principal note amount plus interest, Notes Receivable: Sea Ferries decreases (credit) for the principal amount due, and Interest Revenue increases (credit) for interest earned at maturity. Interest is computed as $100,000 × 10% × (6 ÷ 12). On September 1, 2018, BWW determines that Sea Ferries's account will be uncollectible and sells the balance to a collection agency for a total of $35,000.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Sept. 1, 2018	Cash	35,000	
	Factoring Expense	70,000	
	Accounts Receivable: Sea Ferries		105,000
	To record sale of Accounts Receivable to third-party factor		

Figure 3.71 *By: Rice University Source: Openstax CC BY-NC-SA*

Cash increases (debit) for the agreed-upon discounted value of $35,000, Factoring Expense increases (debit) for the outstanding amount and the discounted sales price, and Accounts Receivable: Sea Ferries decreases (credit) for the original amount owed.

Alliance Cruises is a customer of BWW with an outstanding accounts receivable balance of $50,000. Alliance is unable to pay in full on schedule, so it negotiates with BWW on March 1 to convert its accounts receivable into a notes receivable. BWW agrees to the following terms: six-month note maturity date, 18% annual interest rate, and $10,000 cash up front. BWW records the following entry at contract establishment.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Mar. 1	Cash Notes Receivable: Alliance Accounts Receivable: Alliance *To record conversion of Accounts Receivable to Notes Receivable*	10,000 40,000	 50,000

Figure 3.72 *By: Rice University Source: Openstax CC BY-NC-SA*

Cash increases (debit) for the up-front collection of $10,000, Notes Receivable: Alliance increases (debit) for the principal amount on the note of $40,000, and Accounts Receivable: Alliance decreases (credit) for the original amount Alliance owed of $50,000.

3.6 Tangible v Intangible Assets

Assets are items a business owns.[3] For accounting purposes, assets are categorized as current versus long term, and tangible versus intangible. Assets that are expected to be used by the business for more than one year are considered long-term assets. They are not intended for resale and are anticipated to help generate revenue for the business in the future. Some common long-term assets are computers and other office machines, buildings, vehicles, software, computer code, and copyrights. Although these are all considered long-term assets, some are tangible and some are intangible.

Tangible Assets

An asset is considered a tangible asset when it is an economic resource that has physical substance—it can be seen and touched. Tangible assets can be either short term, such as inventory and supplies, or long term, such as land, buildings, and equipment. To be considered a long-term tangible asset, the item needs to be used in the normal operation of the business for more than one year, not be near the end of its useful life, and the company must have no plan to sell the item in the near future. The useful life is the time period over which an asset cost is allocated. Long-term tangible assets are known as fixed assets.

Businesses typically need many different types of these assets to meet their objectives. These assets differ from the company's products. For example, the computers that **Apple Inc.** intends to sell are considered inventory (a short-term

asset), whereas the computers **Apple**'s employees use for day-to-day operations are long-term assets. In Liam's case, the new silk-screening machine would be considered a long-term tangible asset as he plans to use it over many years to help him generate revenue for his business. Long-term tangible assets are listed as noncurrent assets on a company's balance sheet. Typically, these assets are listed under the category of Property, Plant, and Equipment (PP&E), but they may be referred to as fixed assets or plant assets.

Apple Inc. lists a total of $33,783,000,000 in total Property, Plant and Equipment (net) on its 2017 consolidated balance sheet (see Figure 3.73).[4] As shown in the figure, this net total includes land and buildings, machinery, equipment and internal-use software, and leasehold improvements, resulting in a gross PP&E of $75,076,000,000—less accumulated depreciation and amortization of $41,293,000,000—to arrive at the net amount of $33,783,000,000.

PROPERTY Plant and Equipment, Net (in millions)		
	2017	**2016**
Land and Buildings	$ 13,587	$ 10,185
Machinery, Equipment and Internal-use Software	54,210	44,543
Leasehold Improvements	7,279	6,517
Gross Property, Plant and Equipment	75,076	61,245
Accumulated Depreciation and Amortization	(41,293)	(34,235)
Total Property, Plant and Equipment, net	$ 33,783	$ 27,010

***Figure 3.73 Apple Inc.'s Property, Plant and Equipment, Net**. This report shows the company's consolidated financial statement details as of September 30, 2017, and September 24, 2016 (in millions) Apple Inc.'s Property, Plant and Equipment, Net. By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Intangible Assets

Companies may have other long-term assets used in the

operations of the business that they do not intend to sell, but that do not have physical substance; these assets still provide specific rights to the owner and are called intangible assets. These assets typically appear on the balance sheet following long-term tangible assets (see Figure 3.74.)[5] Examples of intangible assets are patents, copyrights, franchises, licenses, goodwill, sometimes software, and trademarks (Table 3.2). Because the value of intangible assets is very subjective, it is usually not shown on the balance sheet until there is an event that indicates value objectively, such as the purchase of an intangible asset.

A company often records the costs of developing an intangible asset internally as expenses, not assets, especially if there is ambiguity in the expense amounts or economic life of the asset. However, there are also conditions under which the costs can be allocated over the anticipated life of the asset. (The treatment of intangible asset costs can be quite complex and is taught in advanced accounting courses.)

APPLE INC.
Consolidated Balance Sheets
(in millions)

Assets	2017	2016
Current Assets:		
Cash and Cash Equivalents	$ 20,289	$ 20,484
Short-term Marketable Securities	53,892	46,671
Accounts Receivable, Allowances of $58 and $53, respectively	17,874	15,754
Inventories	4,855	2,132
Vendor Nontrade Receivables	17,799	13,545
Other Current Assets	13,936	8,283
Total Current Assets	128,645	106,869
Long-term Marketable Securities	194,714	170,430
Property, Plant, and Equipment, net	33,783	27,010
Goodwill	5,717	5,414
Acquired Intangible Assets, net	2,298	3,206
Other Noncurrent Assets	10,162	8,757
Total Assets	$375,319	$321,686

Figure 3.74 Consolidated Balance Sheets for Apple, Inc. in 2017 and 2016. *Types of Intangible Assets Consolidated Balance Sheets for Apple, Inc. in 2017 and 2016. By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Table 3.4 Accounts and Notes Receivable By: Rice University OpenStax CC BY-NC-SA 4.0

Asset	Useful Life
Patents	Twenty years
Trademarks	Renewable every ten years
Copyrights	Seventy years beyond death of creator
Goodwill	Indefinite

Patents

A patent is a contract that provides a company exclusive rights to produce and sell a unique product. The rights are granted to the inventor by the federal government and provide exclusivity from competition for twenty years. Patents are common within the pharmaceutical industry as they provide an opportunity for drug companies to recoup the significant financial investment on research and development of a new drug. Once the new drug is produced, the company can sell it for twenty years with no direct competition.

Trademarks and Copyrights

A company's trademark is the exclusive right to the name, term, or symbol it uses to identify itself or its products. Federal law allows companies to register their trademarks to protect them from use by others. Trademark registration lasts for ten years with optional 10-year renewable periods. This protection helps prevent impersonators from selling a product similar to another or using its name. For example, a burger joint could not start selling the "Big Mac." Although it has no physical substance, the exclusive right to a term or logo has value to a company and is therefore recorded as an asset.

A copyright provides the exclusive right to reproduce and sell artistic, literary, or musical compositions. Anyone who owns the copyright to a specific piece of work has exclusive rights to that work. Copyrights in the United States last seventy years beyond the death of the original author. While you might not be overly interested in what seems to be an obscure law, it actually directly affects you and your fellow students. It is one of the primary reasons that your copy of the *Collected Works of William Shakespeare* costs about $40 in your bookstore or online, while a textbook, such as *Principles of Biology* or *Principles of Accounting*, can run in the hundreds of dollars.

Goodwill

Goodwill is a unique intangible asset. Goodwill refers to the value of certain favorable factors that a business possesses that allows it to generate a greater rate of return or profit. Such factors include superior management, a skilled workforce, quality products or service, great geographic location, and overall reputation. Companies typically record goodwill when they acquire another business in which the purchase price is in excess of the fair value of the identifiable net assets. The difference is recorded as goodwill on the purchaser's balance sheet. For example, the goodwill of $5,717,000,000 that we see on Apple's consolidated balance sheets for 2017 (see Figure 3.74) was created when Apple purchased another business for a purchase price exceeding the book value of its net assets.

YOUR TURN

Classifying Long-Term Assets as Tangible or Intangible



An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://psu.pb.unizin.org/acctg211/?p=235#h5p-10

Long Descriptions

Property. Plant and Equipment, Net (in millions). For 2017 and 2016, respectively. Land and Buildings $13,587, $10,185; Machinery, Equipment, and Internal-use Software 54,210, 44,543; Leasehold Improvements 7,279, 6,517; Gross Property, Plant and Equipment 75,076, 61,245; Accumulated Depreciation and Amortization (41,293), (34,235); Total Property, Plant and Equipment, net $33,783, $27,010. Return

Apple Inc. Consolidated Balance Sheets (in millions). Assets for 2017 and 2016, respectively. Current Assets: Cash and Cash Equivalents $20,289, $20,484; Short-term Marketable Securities 53,892, 46,671; Accounts Receivable, Allowances of $58 and $53, respectively 17,874, 15,754; Inventories 4,855, 2,132; Vendor Nontrade Receivables 17,799, 13,545; Other Current Assets 13,936, 8,283; Total Current Assets 128,645, 106,869; Long-term Marketable Securities 194,714, 170,430; Property, Plant and

Equipment, net 33,783, 27,010; Goodwill 5,717, 5,414; Acquired Intangible Assets, net 2,298, 3,206; Other Noncurrent Assets 10,162, 8,757; Total Assets $375,319, $321,686. Return

Footnotes

- 3 The Financial Accounting Standards Board (FASB) defines assets as “probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events” (SFAC No. 6, p. 12).
- 4 Apple, Inc. U.S. Securities and Exchange Commission 10-K Filing. November 3, 2017. http://pdf.secdatabase.com/2624/0000320193-17-000070.pdf
- 5 Apple, Inc. U.S. Securities and Exchange Commission 10-K Filing. November 3, 2017. http://pdf.secdatabase.com/2624/0000320193-17-000070.pdf

3.7 Recording the Initial Purchase of an Asset

Assets are recorded on the balance sheet at cost, meaning that all costs to purchase the asset and to prepare the asset for operation should be included. Costs outside of the purchase price may include shipping, taxes, installation, and modifications to the asset.

The journal entry to record the purchase of a fixed asset (assuming that a note payable is used for financing and not a short-term account payable) is shown here.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Fixed Asset (truck, building, etc.) Cash/Notes Payable *To record purchase of fixed asset*	XXX	 XXX

Figure 3.76 *By: Rice University Source: Openstax CC BY-NC-SA*

Applying this to Liam's silk-screening business, we learn that he purchased his silk-screening machine for $5,000 by paying $1,000 cash and the remainder in a note payable over five years. The journal entry to record the purchase is shown here.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Equipment Cash Notes Payable *To recognize purchase of silk-screening machine*	5,000	 1,000 4,000

Figure 3.77 *By: Rice University Source: Openstax CC BY-NC-SA*



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=245#oembed-1

3.9 Depreciation: Allocation of Long-term Asset Cost

Fundamentals of Depreciation

As you have learned, when accounting for a long-term fixed asset, we cannot simply record an expense for the cost of the asset and record the entire outflow of cash in one accounting period. Like all other assets, when purchasing or acquiring a long-term asset, it must be recorded at the historical (initial) cost, which includes all costs to acquire the asset and put it into use. The initial recording of an asset has two steps:

1. Record the initial purchase on the date of purchase, which places the asset on the balance sheet (as property, plant, and equipment) at cost, and record the amount as notes payable, accounts payable, or an outflow of cash.
2. At the end of the period, make an adjusting entry to recognize the depreciation expense. Companies may record depreciation expense incurred annually, quarterly, or monthly.

Following GAAP and the expense recognition principle, the depreciation expense is recognized over the asset's estimated useful life.

CONCEPTS IN PRACTICE

Estimating Useful Life and Salvage Value

Useful life and salvage value are estimates made at the time an asset is placed in service. It is common and expected that the estimates are inaccurate with the uncertainty involved in estimating the future. Sometimes, however, a company may attempt to take advantage of estimating salvage value and useful life to improve earnings. A larger salvage value and longer useful life decrease annual depreciation expense and increase annual net income. An example of this behavior is **Waste Management**, which was disciplined by the Securities and Exchange Commission for fraudulently altering its estimates to reduce depreciation expense and overstate net income by $1.7 billion.[6]

Components Used in Calculating Depreciation

The expense recognition principle that requires that the cost of the asset be allocated over the asset's useful life is the process of depreciation. For example, if we buy a delivery truck to use for the next five years, we would allocate the cost and record depreciation expense across the entire five-year period. The calculation of the depreciation expense for a period is not based on anticipated changes in the fair market value of the asset; instead, the depreciation is based on the allocation of the cost of owning the asset over the period of its useful life.

The following items are important in determining and recording depreciation:

- **Book value**: the asset's original cost less accumulated depreciation.
- **Useful life**: the length of time the asset will be productively used within operations.
- Salvage (residual) value: the price the asset will sell for or be worth as a trade-in when its useful life expires. The determination of salvage value can be an inexact science, since it requires anticipating what will occur in the future. Often, the salvage value is estimated based on past experiences with similar assets.
- **Depreciable base (cost)**: the depreciation expense over the asset's useful life. For example, if we paid $50,000 for an asset and anticipate a salvage value of $10,000, the depreciable base is $40,000. We expect $40,000 in depreciation over the time period in which the asset was used, and then it would be sold for $10,000.

Depreciation records an expense for the value of an asset consumed and removes that portion of the asset from the balance sheet. The journal entry to record depreciation is shown here.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Depreciation Expense Accumulated Depreciation *To record depreciation on asset for period*	XXX	XXX

Figure 3.78 *By: Rice University Source: Openstax CC BY-NC-SA*

Depreciation expense is a common operating expense that appears on an income statement. Accumulated depreciation is a contra account, meaning it is attached to another account and is used to offset the main account balance that records

the total depreciation expense for a fixed asset over its life. In this case, the asset account stays recorded at the historical value but is offset on the balance sheet by accumulated depreciation. Accumulated depreciation is subtracted from the historical cost of the asset on the balance sheet to show the asset at book value. Book value is the amount of the asset that has not been allocated to expense through depreciation.

HARRY COMPANY Partial Balance Sheet December 31, 2020	
Assets	
Property, Plant and Equipment:	
Truck	$25,000
− Accumulated Depreciation	(5,000)
	$20,000

Figure 3.79 *By: Rice University Source: Openstax CC BY-NC-SA*

In this case, the asset's book value is $20,000: the historical cost of $25,000 less the accumulated depreciation of $5,000.

It is important to note, however, that not all long-term assets are depreciated. For example, land is not depreciated because depreciation is the allocating of the expense of an asset over its useful life. How can one determine a useful life for land? It is assumed that land has an unlimited useful life; therefore, it is not depreciated, and it remains on the books at historical cost.

Once it is determined that depreciation should be accounted for, there are three methods that are most commonly used to calculate the allocation of depreciation expense: the *straight-line method*, the *units-of-production method*, and the *double-declining-balance method*. A fourth method, the *sum-of-the-years-digits* method, is another *accelerated* option that has been losing popularity

and can be learned in intermediate accounting courses. Let's use the following scenario involving Kenzie Company to work through these three methods.

Assume that on January 1, 2019, Kenzie Company bought a printing press for $54,000. Kenzie pays shipping costs of $1,500 and setup costs of $2,500, assumes a useful life of five years or 960,000 pages. Based on experience, Kenzie Company anticipates a salvage value of $10,000.

Recall that determination of the costs to be depreciated requires including all costs that prepare the asset for use by the company. The Kenzie example would include shipping and setup costs. Any costs for maintaining or repairing the equipment would be treated as regular expenses, so the total cost would be $58,000, and, after allowing for an anticipated salvage value of $10,000 in five years, the business could take $48,000 in depreciation over the machine's economic life.

	Total Cost
Purchase Price	$ 54,000
Shipping Costs	1,500
Set-up Costs	2,500
Total Cost	$ 58,000
− Salvage Value	(10,000)
Depreciable Base	$ 48,000

Figure 3.80 *By: Rice University Source: Openstax CC BY-NC-SA*

CONCEPTS IN PRACTICE

Fixed Assets

You work for **Georgia-Pacific** as an accountant in charge of the fixed assets subsidiary ledger at a production and warehouse facility in Pennsylvania. The facility is in the process of updating and replacing several asset categories, including warehouse storage units, fork trucks, and equipment on the production line. It is your job to keep the information in the fixed assets subsidiary ledger up to date and accurate. You need information on original historical cost, estimated useful life, salvage value, depreciation methods, and additional capital expenditures. You are excited about the new purchases and upgrades to the facility and how they will help the company serve its customers better. However, you have been in your current position for only a few years and have never overseen extensive updates, and you realize that you will have to gather a lot of information at once to keep the accounting records accurate. You feel overwhelmed and take a minute to catch your breath and think through what you need. After a few minutes, you realize that you have many people and many resources to work with to tackle this project. Whom will you work with and how will you go about gathering what you need?

Straight-Line Depreciation

Straight-line depreciation is a method of depreciation that evenly splits the depreciable amount across the useful life of

the asset. Therefore, we must determine the yearly depreciation expense by dividing the depreciable base of $48,000 by the economic life of five years, giving an annual depreciation expense of $9,600. The journal entries to record the first two years of expenses are shown, along with the balance sheet information. Here are the journal entry and information for year one:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Depreciation Expense: Printing Press Accumulated Depreciation: Printing Press *To record depreciation on asset for period*	9,600	9,600

Figure 3.81 *By: Rice University Source: Openstax CC BY-NC-SA*

Printing Press	$58,000
− Accumulated Depreciation: Printing Press	(9,600)
Net Book Value	$48,400

Figure 3.82 *By: Rice University Source: Openstax CC BY-NC-SA*

After the journal entry in year one, the press would have a book value of $48,400. This is the original cost of $58,000 less the accumulated depreciation of $9,600. Here are the journal entry and information for year two:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2020	Depreciation Expense: Printing Press Accumulated Depreciation: Printing Press *To record depreciation on asset for period*	9,600	9,600

Figure 3.83 *By: Rice University Source: Openstax CC BY-NC-SA*

Printing Press	$ 58,000
– Accumulated Depreciation: Printing Press	(19,200)
Net Book Value	$ 38,800

Figure 3.84 *By: Rice University Source: Openstax CC BY-NC-SA*

Kenzie records an annual depreciation expense of $9,600. Each year, the accumulated depreciation balance increases by $9,600, and the press's book value decreases by the same $9,600. At the end of five years, the asset will have a book value of $10,000, which is calculated by subtracting the accumulated depreciation of $48,000 (5 × $9,600) from the cost of $58,000.

Units-of-Production Depreciation

Straight-line depreciation is efficient, accounting for assets used consistently over their lifetime, but what about assets that are used with less regularity? The units-of-production depreciation method bases depreciation on the actual usage of the asset, which is more appropriate when an asset's life is a function of usage instead of time. For example, this method could account for depreciation of a printing press for which the depreciable base is $48,000 (as in the straight-line method), but now the number of pages the press prints is important.

In our example, the press will have total depreciation of $48,000 over its useful life of 960,000 pages. Therefore, we would divide $48,000 by 960,000 pages to get a cost per page of $0.05. If Kenzie printed 180,000 pages in the first year, the depreciation expense would be 180,000 pages × $0.05 per page, or $9,000. The journal entry to record this expense would be the same as with straight-line depreciation: only the dollar amount would have changed. The presentation of

accumulated depreciation and the calculation of the book value would also be the same. Kenzie would continue to depreciate the asset until a total of $48,000 in depreciation was taken after printing 960,000 total pages.

Double-Declining-Balance Depreciation

The double-declining-balance depreciation method is the most complex of the three methods because it accounts for both time and usage and takes more expense in the first few years of the asset's life. Double-declining considers time by determining the percentage of depreciation expense that would exist under straight-line depreciation. To calculate this, divide 100% by the estimated life in years. For example, a five-year asset would be 100 ÷ 5, or 20% a year. A four-year asset would be 100 ÷ 4, or 25% a year. Next, because assets are typically more efficient and "used" more heavily early in their life span, the double-declining method takes usage into account by doubling the straight-line percentage. For a four-year asset, multiply 25% (100% ÷ 4-year life) × 2, or 50%. For a five-year asset, multiply 20% (100% ÷ 5-year life) × 2, or 40%.

One unique feature of the double-declining-balance method is that in the first year, the estimated salvage value is not subtracted from the total asset cost before calculating the first year's depreciation expense. Instead the total cost is multiplied by the calculated percentage. However, depreciation expense is not permitted to take the book value below the estimated salvage value, as demonstrated in the following text.

Year	Depreciation Expense	Accumulated Depreciation	Book Value
			$58,000
1: $58,000 × 40% =	$23,200	$23,200	34,800
2: $34,800 × 40% =	13,920	37,120	20,880
3: $20,880 × 40% =	8,352	45,472	12,528
4: $12,528 – $10,000 =	2,528	48,000	10,000
5	0	48,000	10,000
Total	$48,000	$48,000	$10,000

Figure 3.85 *By: Rice University Source: Openstax CC BY-NC-SA Long Description*

Notice that in year four, the remaining book value of $12,528 was not multiplied by 40%. This is because the expense would have been $5,011.20, and since we cannot depreciate the asset below the estimated salvage value of $10,000, the expense cannot exceed $2,528, which is the amount left to depreciate (difference between the book value of $12,528 and the salvage value of $10,000). Since the asset has been depreciated to its salvage value at the end of year four, no depreciation can be taken in year five.

In our example, the first year's double-declining-balance depreciation expense would be $58,000 × 40%, or $23,200. For the remaining years, the double-declining percentage is multiplied by the remaining book value of the asset. Kenzie would continue to depreciate the asset until the book value and the estimated salvage value are the same (in this case $10,000).

The net effect of the differences in straight-line depreciation versus double-declining-balance depreciation is that under the double-declining-balance method, the allowable depreciation expenses are greater in the earlier years than those allowed for straight-line depreciation. However, over the depreciable life of the asset, the total depreciation expense taken will be the same, no matter which method the entity chooses. For example, in the current example both straight-line and double-

declining-balance depreciation will provide a total depreciation expense of $48,000 over its five-year depreciable life.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=241#oembed-1

Summary of Depreciation

Table 3.3 compares the three methods discussed. Note that although each time-based (straight-line and double-declining balance) annual depreciation expense is different, after five years the total amount depreciated (accumulated depreciation) is the same. This occurs because at the end of the asset's useful life, it was expected to be worth $10,000: thus, both methods depreciated the asset's value by $48,000 over that time period.

The units of production method is different from the two above methods in that while those methods are based on time factors, the units of production is based on usage. However, the total amount of depreciation taken over an asset's economic life will still be the same. In our example, the total depreciation will be $48,000, even though the sum-of-the-years-digits method could take only two or three years or possibly six or seven years to be allocated.

Table 3.5 Accounts and Notes Receivable By: Rice University
OpenStax CC BY-NC-SA 4.0

Depreciation Method	Calculation
Straight line	(Cost – salvage value)/Useful life
Units of production	(Cost – salvage value) × (Units produced in current period/Estimated total units to be produced)
Double declining balance	Book value × Straight-line annual depreciation percentage × 2

Period	Straight-Line Depreciation Method	Units of Production Method	Double-Declining-Balance Method
Year 1	$ 9,600	(180,000 units) $ 9,000	$23,200
Year 2	9,600	(200,000 units) 10,000	13,920
Year 3	9,600	(210,000 units) 10,500	8,352
Year 4	9,600	(190,000 units) 9,500	2,528
Year 5	9,600	(180,000 units) 9,000	0
Total	$48,000	$48,000	$48,000

Figure 3.86 *By: Rice University Source: Openstax CC BY-NC-SA Long Description*

Partial-Year Depreciation

A company will usually only own depreciable assets for a portion of a year in the year of purchase or disposal. Companies must be consistent in how they record depreciation for assets owned for a partial year. A common method is to allocate depreciation expense based on the number of months the asset is owned in a year. For example, a company purchases an asset with a total cost of $58,000, a five-year useful life, and a salvage value of $10,000. The annual depreciation is $9,600 ([$58,000 – 10,000] ÷ 5). However, the asset is purchased at the beginning of the fourth month of the fiscal year. The company will own the asset for nine months of the first year. The depreciation expense of the first year is $7,200 ($9,600 × 9/

12). The company will depreciate the asset $9,600 for the next four years, but only $2,400 in the sixth year so that the total depreciation of the asset over its useful life is the depreciable amount of $48,000 ($7,200 + 9,600 + 9,600 + 9,600 + 9,600 + 2,400).

YOUR TURN

Calculating Depreciation Costs

Liam buys his silk screen machine for $10,000. He estimates that he can use this machine for five years or 100,000 presses, and that the machine will only be worth $1,000 at the end of its life. He also estimates that he will make 20,000 clothing items in year one and 30,000 clothing items in year two. Determine Liam's depreciation costs for his first two years of business under straight-line, units-of-production, and double-declining-balance methods. Also, record the journal entries.

Solution

Straight-line method: ($10,000 – $1,000) ÷ 5 = $1,800 per year for both years.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Depreciation Expense	1,800	
	Accumulated Depreciation		1,800

Figure 3.87 *By: Rice University Source: Openstax CC BY-NC-SA*

Units-of-production method: ($10,000 – $1,000) ÷ 100,000= $0.09 per press

Year 1 expense: $0.09 × 20,000 = $1,800

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Depreciation Expense Accumulated Depreciation	1,800	 1,800

Figure 3.88 *By: Rice University Source: Openstax CC BY-NC-SA*

Year 2 expense: $0.09 × 30,000 = $2,700

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Depreciation Expense Accumulated Depreciation	2,700	 2,700

Figure 3.89 *By: Rice University Source: Openstax CC BY-NC-SA*

Double-declining-balance method:

Year 1 expense: [($10,000 – 0) ÷ 5] × 2 = $4,000

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Depreciation Expense Accumulated Depreciation	4,000	 4,000

Figure 3.90 *By: Rice University Source: Openstax CC BY-NC-SA*

Year 2 expense: [($10,000 – $4,000) ÷ 5] × 2 = $2,400

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Depreciation Expense Accumulated Depreciation	2,400	 2,400

Figure 3.91 *By: Rice University Source: Openstax CC BY-NC-SA*

Special Issues in Depreciation

While you've now learned thebasic foundationof the major available depreciation methods, there are a few special issues. Until now, we have assumed a definite physical or economically functional useful life for the depreciable assets. However, in some situations, depreciable assets can be used beyond their useful life. If so desired, the company could continue to use the asset beyond the original estimated economic life. In this case, a new remaining depreciation expense would be calculated based on the remaining depreciable base and estimated remaining economic life.

Assume in the earlier Kenzie example that after five years and $48,000 in accumulated depreciation, the company estimated that it could use the asset for two more years, at which point the salvage value would be $0. The company would be able to take an additional $10,000 in depreciation over the extended two-year period, or $5,000 a year, using the straight-line method.

As with the straight-line example, the asset could be used for more than five years, with depreciation recalculated at the end of year five using the double-declining balance method. While the process of calculating the additional depreciation for the double-declining-balance method would differ from that of the straight-line method, it would also allow the company to take an additional $10,000 after year five, as with the other methods, so long as the cost of $58,000 is not exceeded.

As a side note, there often is a difference in useful lives for assets when following GAAP versus the guidelines for depreciation under federal tax law, as enforced by the Internal Revenue Service (IRS). This difference is not unexpected when you consider that tax law is typically determined by the United States Congress, and there often is an economic reason for tax policy.

For example, if we want to increase investment in real estate,

shortening the economic lives of real estate for taxation calculations can have a positive increasing effect on new construction. If we want to slow down new production, extending the economic life can have the desired slowing effect. In this course, we concentrate on financial accounting depreciation principles rather than tax depreciation.

Fundamentals of Depletion of Natural Resources

Another type of fixed asset is natural resources, assets a company owns that are consumed when used. Examples include lumber, mineral deposits, and oil/gas fields. These assets are considered natural resources while they are still part of the land; as they are extracted from the land and converted into products, they are then accounted for as inventory (raw materials). Natural resources are recorded on the company's books like a fixed asset, at cost, with total costs including all expenses to acquire and prepare the resource for its intended use.

As the resource is consumed (converted to a product), the cost of the asset must be expensed: this process is called depletion. As with depreciation of nonnatural resource assets, a contra account called accumulated depletion, which records the total depletion expense for a natural resource over its life, offsets the natural resource asset account. Depletion expense is typically calculated based on the number of units extracted from cutting, mining, or pumping the resource from the land, similar to the units-of-production method. For example, assume a company has an oil well with an estimated 10,000 gallons of crude oil. The company purchased this well for $1,000,000, and the well is expected to have no salvage value once it is pumped dry. The depletion cost per gallon will

be $1,000,000 ÷ 10,000 = $100. If the company extracts 4,000 gallons of oil in a given year, the depletion expense will be $400,000.

Fundamentals of Amortization of an Intangible

Recall that intangible assets are recorded as long-term assets at their cost. As with tangible assets, many intangible assets have a finite (limited) life span so their costs must be allocated over their useful lives: this process is amortization. Depreciation and amortization are similar in nature but have some important differences. First, amortization is typically only done using the straight-line method. Second, there is usually no salvage value for intangible assets because they are completely used up over their life span. Finally, an accumulated amortization account is not required to record yearly expenses (as is needed with depreciation); instead, the intangible asset account is written down each period.

For example, a company called Patents-R-Us purchased a product patent for $10,000, granting the company exclusive use of that product for the next twenty years. Therefore, unless the company does not think the product will be useful for all twenty years (at that point the company would use the shorter useful life of the product), the company will record amortization expense of $500 a year or ($10,000 ÷ 20 years). Assuming that it was placed into service on October 1, 2019, the journal entry would be as follows:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 1, 2019	Amortization Expense	125	
	Patent		125
	To record amortization on patent for period		

Figure 3.92 *By: Rice University Source: Openstax CC BY-NC-SA*

Long Descriptions

Columns labeled left to right: Year, Depreciation Expense, Accumulated Depreciation, Book Value. Line 1: $58,000 in the Book Value column. Line 2: 1: $58,000 times 40 percent equals $23,200, $23,200, 34,800. Line 3: 2: $34,800 times 40 percent equals $13,920, 37,120, 20,880. Line 4: 3: $20,880 times 40 percent equals 8,352, 45,472, 12,528. Line 5: 4: $12,528 minus $10,000 equals 2,528, 48,000, 10,000. Line 6: 5, 0, 48,000, 10.000. Line 7: Total, $48,000, $48,000, $10,000. Return

Columns labeled left to right: Period, Straight-Line Depreciation Method, Units of Production Method, Double-Declining Balance Method. Year 1, $9,600, (180,000 units) $9,000, $23,200. Year 2, 9,600, (200,000 units) 10,000, 13,920. Year 3, 9,600, (210,000 units) 10,500, 8,352. Year 4, 9,600, (190,000 units) 9,500, 2,528. Year 5, 9,600, (180,000 units) 9,000, 0. Total, $48,000, $48,000, $48,000." Return

Footnotes

- 6 U.S. Securities and Exchange Commission. "Judge Enters Final Judgment against Former CFO of Waste Management, Inc. Following Jury Verdict in SEC's Favor." January 3, 2008. https://www.sec.gov/news/press/2008/2008-2.htm

3.8 Capitalized Costs v. Expenses

When a business purchases a long-term asset (used for more than one year), it classifies the asset based on whether the asset is used in the business's operations. If a long-term asset is used in the business operations, it will belong in property, plant, and equipment or intangible assets. In this situation the asset is typically capitalized. Capitalization is the process by which a long-term asset is recorded on the balance sheet and its allocated costs are expensed on the income statement over the asset's economic life.

In short- CAPITALIZE means to record the item as an ASSET on the BALANCE SHEET.

EXPENSE items that do not have long-term, future value or are immaterial (small dollars).

Long-term assets that are not used in daily operations are typically classified as an investment. For example, if a business owns land on which it operates a store, warehouse, factory, or offices, the cost of that land would be included in property, plant, and equipment. However, if a business owns a vacant piece of land on which the business conducts no operations (and assuming no current or intermediate-term plans for development), the land would be considered an investment.

YOUR TURN! Select the best option for each scenario.



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here:
https://psu.pb.unizin.org/acctg211/?p=239#h5p-9

Property, Plant, and Equipment (Fixed Assets)

Why are the costs of putting a long-term asset into service capitalized and written off as expenses (depreciated) over the economic life of the asset? Let's return to Liam's start-up business as an example. Liam plans to buy a silk-screening machine to help create clothing that he will sell. The machine is a long-term asset, because it will be used in the business's daily operation for many years. If the machine costs Liam $5,000 and it is expected to be used in his business for several years, generally accepted accounting principles (GAAP) require the allocation of the machine's costs over its useful life, which is the period over which it will produce revenues. Overall, in determining a company's financial performance, we would not expect that Liam should have an expense of $5,000 this year and $0 in expenses for this machine for future years in which it is being used. GAAP addressed this through the *expense recognition* (*matching*) principle, which states that expenses should be recorded in the same period with the revenues that the expense helped create. In Liam's case, the $5,000 for this machine should be allocated over the years in which it helps to generate revenue for the business. Capitalizing the machine allows this to occur. As stated previously, to capitalize is to record a long-term asset on the balance sheet and expense

its allocated costs on the income statement over the asset's economic life. Therefore, when Liam purchases the machine, he will record it as an asset on the financial statements.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Machine Cash	5,000	 5,000

Figure 3.75 *By: Rice University Source: Openstax CC BY-NC-SA*

When capitalizing an asset, the total cost of acquiring the asset is included in the cost of the asset. This includes additional costs beyond the purchase price, such as shipping costs, taxes, assembly, and legal fees. For example, if a real estate broker is paid $8,000 as part of a transaction to purchase land for $100,000, the land would be recorded at a cost of $108,000.

Over time as the asset is used to generate revenue, Liam will need to depreciate the asset.

Depreciation is the process of allocating the cost of a tangible asset over its useful life, or the period of time that the business believes it will use the asset to help generate revenue.

Investments

A short-term or long-term asset that is not used in the day-to-day operations of the business is considered an investment and is not expensed, since the company does not expect to use up the asset over time. On the contrary, the company hopes that the assets (investment) would grow in value over time. Short-term investments are investments that are expected to be sold within a year and are recorded as current assets.

CONCEPTS IN PRACTICE

Vehicle Repairs and Enhancements

Automobiles are a useful way of looking at the difference between repair and maintenance expenses and capitalized modifications. Routine repairs such as brake pad replacements are recorded as repair and maintenance expense. They are an expected part of owning a vehicle. However, a car may be modified to change its appearance or performance. For example, if a supercharger is added to a car to increase its horsepower, the car's performance is increased, and the cost should be included as a part of the vehicle asset. Likewise, if replacing the engine of an older car extends its useful life, that cost would also be capitalized.

Repair and Maintenance Costs of Property, Plant, and Equipment

Long-term assets may have additional costs associated with them over time. These additional costs may be capitalized or expensed based on the nature of the cost. For example, **Walmart**'s financial statements explain that major improvements are capitalized, while costs of normal repairs and maintenance are charged to expense as incurred.

An amount spent is considered a current expense, or an amount charged in the current period, if the amount incurred did not help to extend the life of or improve the asset. For example, if a service company cleans and maintains Liam's silk-screening machine every six months, that service does not

extend the useful life of the machine beyond the original estimate, increase the capacity of the machine, or improve the quality of the silk-screening performed by the machine. Therefore, this maintenance would be expensed within the current period. In contrast, if Liam had the company upgrade the circuit board of the silk-screening machine, thereby increasing the machine's future capabilities, this would be capitalized and depreciated over its useful life.

3.10 Intangible Assets

Intangible assets can be difficult to understand and incorporate into the decision-making process. In this section we explain them in more detail and provide examples of how to amortize each type of intangible asset.

Fundamentals of Intangible Assets

Intangibles are recorded at their acquisition cost, as are tangible assets. The costs of internally generated intangible assets, such as a patent developed through research and development, are recorded as expenses when incurred. An exception is legal costs to register or defend an intangible asset. For example, if a company incurs legal costs to defend a patent it has developed internally, the costs associated with developing the patent are recorded as an expense, but the legal costs associated with defending the patent would be capitalized as a patent intangible asset.

Amortization of intangible assets is handled differently than depreciation of tangible assets. Intangible assets are typically amortized using the straight-line method; there is typically no salvage value, as the usefulness of the asset is used up over its lifetime, and no accumulated amortization account is needed. Additionally, based on regulations, certain intangible assets are restricted and given limited life spans, while others are infinite in their economic life and not amortized.

Copyrights

While copyrights have a finite life span of 70 years beyond the author's death, they are amortized over their estimated useful life. Therefore, if a company acquired a copyright on a new graphic novel for $10,000 and estimated it would be able to sell that graphic novel for the next ten years, it would amortize $1,000 a year ($10,000 ÷ ten years), and the journal entry would be as shown. Assume that the novel began sales on January 1, 2019.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Amortization Expense	1,000	
	Copyright		1,000

Figure 3.93 *By: Rice University Source: Openstax CC BY-NC-SA*

Patents

Patents are issued to the inventor of the product by the federal government and last twenty years. All costs associated with creating the product being patented (such as research and development costs) are expensed; however, direct costs to obtain the patent could be capitalized. Otherwise, patents are capitalized only when purchased. Like copyrights, patents are amortized over their useful life, which can be shorter than twenty years due to changing technology. Assume Mech Tech purchased the patent for a new pump system. The patent cost $20,000, and the company expects the pump to be a useful product for the next twenty years. Mech Tech will then amortize the $20,000 over the next twenty years, which is $1,000 a year.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Amortization Expense	1,000	
	Patent		1,000

Figure 3.94 *By: Rice University Source: Openstax CC BY-NC-SA*

Trademarks

Companies can register their trademarks with the federal government for ten years with the opportunity to renew the trademark every ten years. Trademarks are recorded as assets only when they are purchased from another company and are valued based on market price at the time of purchase. In this case, these trademarks are amortized over the expected useful life. In some cases, the trademark may be seen as having an indefinite life, in which case there would be no amortization.

Goodwill

From an accounting standpoint, goodwill is internally generated and is not recorded as an asset unless it is purchased during the acquisition of another company. The purchase of goodwill occurs when one company buys another company for an amount greater than the total value of the company's net assets. The value difference between net assets and the purchase price is then recorded as goodwill on the purchaser's financial statements. For example, say the London Hoops professional basketball team was sold for $10 million. The new owner received net assets of $7 million, so the goodwill (value of the London Hoops above its net assets) is $3 million. The following journal entry shows how the new owner would record this purchase.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1, 2019	Net Assets Goodwill Cash	7,000,000 3,000,000	 10,000,000

Figure 3.95 *By: Rice University Source: Openstax CC BY-NC-SA*

Goodwill does not have an expected life span and therefore is not amortized. However, a company is required to compare the book value of goodwill to its market value at least annually to determine if it needs to be adjusted. This comparison process is called *testing for impairment*. If the market value of goodwill is found to be lower than the book value, then goodwill needs to be reduced to its market value. If goodwill is impaired, it is reduced with a credit, and an impairment loss is debited. Goodwill is never increased beyond its original cost. For example, if the new owner of London Hoops assesses that London Hoops now has a fair value of $9,000,000 rather than the $10,000,000 of the original purchase, the owner would need to record the impairment as shown in the following journal entry.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Impairment Loss Goodwill	1,000,000	 1,000,000

Figure 3.96 *By: Rice University Source: Openstax CC BY-NC-SA*

CONCEPTS IN PRACTICE

Microsoft's Goodwill

In 2016, **Microsoft** bought **LinkedIn** for $25 billion. **Microsoft** wanted the brand, website platform, and software, which are intangible assets of **LinkedIn**, and therefore **Microsoft** only received $4 billion in net assets. The overpayment by **Microsoft** is not necessarily a bad business decision, but rather the premium or value of those intangible assets that **LinkedIn** owned and **Microsoft** wanted. The $21 billion difference will be listed on **Microsoft**'s balance sheet as goodwill.

3.11 Sale of an Asset

When an asset is sold, the company must account for its depreciation up to the date of sale. This means companies may be required to record a depreciation entry before the sale of the asset to ensure it is current. After ensuring that the net book value of an asset is current, the company must determine if the asset has sold at a gain, at a loss, or at book value. We look at examples of each accounting alternative using the Kenzie Company data.

Recall that Kenzie's press has a depreciable base of $48,000 and an economic life of five years. If Kenzie sells the press at the end of the third year, the company would have taken three years of depreciation amounting to $28,800 ($9,600 × 3 years). With an original cost of $58,000, and after subtracting the accumulated depreciation of $28,800, the press would have a book value of $29,200. If the company sells the press for $31,000, it would realize a gain of $1,800, as shown.

Cost of Press	$ 58,000
− Accumulated Depreciation: Printing Press	(28,800)
Book Value	$ 29,200
Sales Price	$ 31,000
− Book Value	(29,200)
Gain on Sale of Printing Press	$ 1,800

Figure 3.97 *By: Rice University Source: Openstax CC BY-NC-SA*

The journal entry to record the sale is shown here.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Cash Accumulated Depreciation: Printing Press Printing Press Gain on Sale: Printing Press	31,000 28,800	 58,000 1,800

Figure 3.98 *By: Rice University Source: Openstax CC BY-NC-SA*

If Kenzie sells the printing press for $27,100, what would the journal entries be? The book value of the press is $29,200, so Kenzie would be selling the press at a loss. The journal entry to record the sale is shown here.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Cash Accumulated Depreciation: Printing Press Loss on Sale of Printing Press Printing Press	27,100 28,800 2,100	 58,000

Figure 3.99 *By: Rice University Source: Openstax CC BY-NC-SA*

What if Kenzie sells the press at exactly book value? In this case, the company will realize neither a gain nor a loss. Here is the journal entry to record the sale.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31, 2019	Cash Accumulated Depreciation: Printing Press Printing Press	29,200 28,800	 58,000

Figure 3.100 *By: Rice University Source: Openstax CC BY-NC-SA*

While it would be ideal to estimate a salvage value that provides neither a gain nor a loss upon the retirement and sale of a long-term asset, this type of accuracy is virtually impossible to reach, unless you negotiate a fixed future sales price. For

example, you might buy a truck for $80,000 and lock in a five-year life with 100,000 or fewer miles driven. Under these conditions, the dealer might agree to pay you $20,000 for the truck in five years.

Under these conditions, you could justify calculating your depreciation over a five-year period, using a depreciable base of $60,000. Under the straight-line method, this would provide an annual depreciation amount of $12,000. Also, when you sell the truck to the dealer after five years, the sales price will be $20,000, and the book value will be $20,000, so there would be neither a gain nor a loss on the sale.

In the Kenzie example where the asset was sold for $31,000 after three years, Kenzie should have recorded a total of $27,000 in depreciation (cost of $58,000 less the sales value of $31,000). However, the company recorded $28,800 in depreciation over the three-year period. Subtracting the gain of $1,800 from the total depreciation expense of $28,800 shows the true cost of using the asset as $27,000, and not the depreciation amount of $28,800.

When the asset was sold for $27,100, the accounting records would show $30,900 in depreciation (cost of $58,000 less the sales price of $27,100). However, depreciation is listed as $28,800 over the three-year period. Adding the loss of $2,100 to the total depreciation expense of $28,800 results in a cost of $30,900 for use of the asset rather than the $28,800 depreciation.

If the asset sells for exactly the book value, its depreciation expense was estimated perfectly, and there is no gain or loss. If it sells for $29,200 and had a book value of $29,200, its depreciation expense of $28,800 matches the original estimate.





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CHAPTER 4- INTERNAL CONTROLS

Ethics, Professional Standards & Fraud

4.1 Analyzing Fraud in the Accounting Workplace

In this chapter, one of the major issues examined is the concept of fraud. Fraud can be defined in many ways, but for the purposes of this course we define it as the act of intentionally deceiving a person or organization or misrepresenting a relationship in order to secure some type of benefit, either financial or nonfinancial. We initially discuss it in a broader sense and then concentrate on the issue of fraud as it relates to the accounting environment and profession.

Workplace fraud is typically detected by anonymous tips or by accident, so many companies use the fraud triangle to help in the analysis of workplace fraud. Donald Cressey, an American criminologist and sociologist, developed the fraud triangle to help explain why law-abiding citizens sometimes commit serious workplace-related crimes. He determined that people who embezzled money from banks were typically otherwise law-abiding citizens who came into a "non-sharable financial problem." A non-sharable financial problem is when a trusted individual has a financial issue or problem that he or she feels can't be shared. However, it is felt that the problem can be alleviated by surreptitiously violating the position of trust through some type of illegal response, such as embezzlement or other forms of misappropriation. The guilty party is typically able to rationalize the illegal action. Although they committed serious financial crimes, for many of them, it was their first offense.

The fraud triangle consists of three elements: incentive, opportunity, and rationalization (Figure 4.1). When an

employee commits fraud, the elements of the fraud triangle provide assistance in understanding the employee's methods and rationale. Each of the elements needs to be present for workplace fraud to occur.

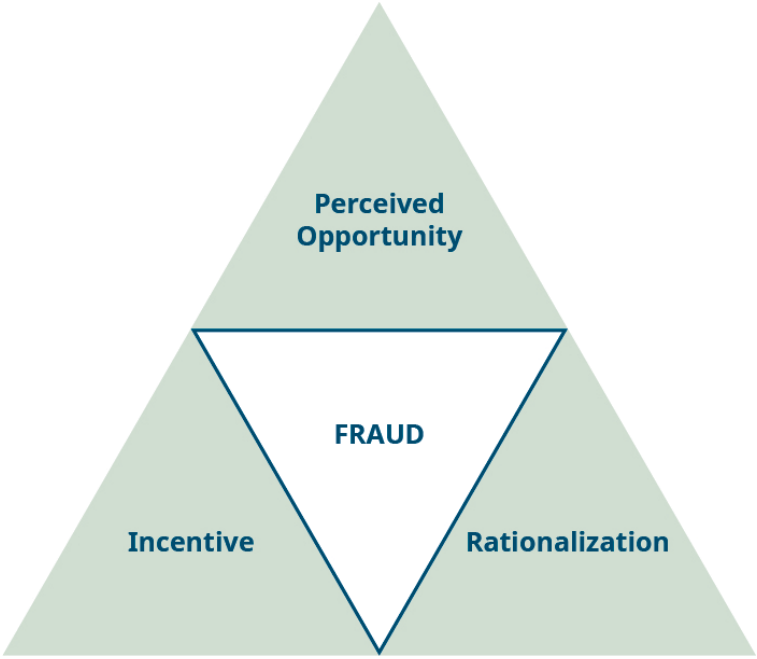


Figure 4.1 Fraud Triangle *The three components identified in the fraud triangle are perceived opportunity, incentive, and rationalization. Fraud Triangle. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Perceived opportunity is when a potential fraudster thinks that the internal controls are weak or sees a way to override them. This is the area in which an accountant has the greatest ability to mitigate fraud, as the accountant can review and test internal controls to locate weaknesses. After identifying a weak, circumvented, or nonexistent internal control, management,

along with the accountant, can implement stronger internal controls.

Rationalization is a way for the potential fraudster to internalize the concept that the fraudulent actions are acceptable. A typical fraudster finds ways to personally justify his or her illegal and unethical behavior. Using rationalization as a tool to locate or combat fraud is difficult, because the outward signs may be difficult to recognize.

Incentive (or pressure) is another element necessary for a person to commit fraud. The different types of pressure are typically found in (1) vices, such as gambling or drug use; (2) financial pressures, such as greed or living beyond their means; (3) work pressure, such as being unhappy with a job; and (4) other pressures, such as the desire to appear successful. Pressure may be more recognizable than rationalization, for instance, when coworkers seem to be living beyond their means or complain that they want to get even with their employer because of low pay or other perceived slights.

Typically, all three elements of the triangle must be in place for an employee to commit fraud, but companies usually focus on the opportunity aspect of mitigating fraud because, they can develop internal controls to manage the risk. The rationalization and pressure to commit fraud are harder to understand and identify. Many organizations may recognize that an employee may be under pressure, but many times the signs of pressure are missed.

Virtually all types of businesses can fall victim to fraudulent behavior. For example, there have been scams involving grain silos in Texas inflating their inventory, the sale of mixed oils labeled as olive oil across the globe, and the tens of billions of dollars that Bernie Madoff swindled out of investors and not-for-profits.

To demonstrate how a fraud can occur, let's examine a sample case in a little more detail. In 2015, a long-term employee of the **SCICAP Federal Credit Union** in Iowa was

convicted of stealing over $2.7 million in cash over a 37-year period. The employee maintained two sets of financial records: one that provided customers with correct information as to how much money they had on deposit within their account, and a second set of books that, through a complex set of transactions, moved money out of customer accounts and into the employee's account as well as those of members of her family. To ensure that no other employee within the small credit union would have access to the duplicate set of books, the employee never took a vacation over the 37-year period, and she was the only employee with password-protected access to the system where the electronic records were stored.

There were, at least, two obvious violations of solid internal control principles in this case. The first was the failure to require more than one person to have access to the records, which the employee was able to maintain by not taking a vacation. Allowing the employee to not share the password-protected access was a second violation. If more than one employee had access to the system, the felonious employee probably would have been caught much earlier. What other potential failures in the internal control system might have been present? How does this example of fraud exhibit the three components of the fraud triangle?

Unfortunately, this is one of many examples that occur on a daily basis. In almost any city on almost any day, there are articles in local newspapers about a theft from a company by its employees. Although these thefts can involve assets such as inventory, most often, employee theft involves cash that the employee has access to as part of his or her day-to-day job.

4.2 Internal Controls - Overview

Internal controls are the systems used by an organization to manage risk and diminish the occurrence of fraud. The internal control structure is made up of the control environment, the accounting system, and procedures called *control activities*. Several years ago, the Committee of Sponsoring Organizations (COSO), which is an independent, private-sector group whose five sponsoring organizations periodically identify and address specific accounting issues or projects, convened to address the issue of internal control deficiencies in the operations and accounting systems of organizations. They subsequently published a report that is known as COSO's *Internal Control-Integrated Framework*. The five components that they determined were necessary in an effective internal control system make up the components in the internal controls triangle shown in Figure 4.2.

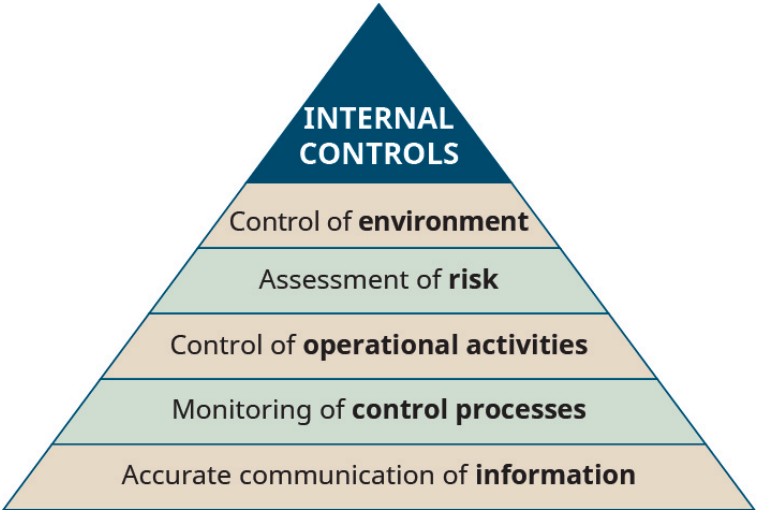


Figure 4.2 The Internal Control Environment *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Here we address some of the practical aspects of internal control systems. The internal control system consists of the formal policies and procedures that do the following:

- ensure assets are properly used
- ensure that the accounting system is functioning properly
- monitor operations of the organization to ensure maximum efficiency
- ensure that assets are kept secure
- ensure that employees are in compliance with corporate policies

A properly designed and functioning internal control system will not eliminate the risk of loss, but it will reduce the risk.

Different organizations face different types of risk, but when internal control systems are lacking, the opportunity arises for fraud, misuse of the organization's assets, and employee or

workplace corruption. Part of an accountant's function is to understand and assist in maintaining the internal control in the organization.

Internal control keeps the assets of a company safe and keeps the company from violating any laws, while fairly recording the financial activity of the company in the accounting records. Proper accounting records are used to create the financial statements that the owners use to evaluate the operations of a company, including all company and employee activities. Internal controls are more than just reviews of how items are recorded in the company's accounting records; they also include comparing the accounting records to the actual operations of the company.

For example, a movie theater earns most of its profits from the sale of popcorn and soda at the concession stand. The prices of the items sold at the concession stand are typically high, even though the costs of popcorn and soda are low. Internal controls allow the owners to ensure that their employees do not give away the profits by giving away sodas and popcorn.

If you were to go to the concession stand and ask for a cup of water, typically, the employee would give you a clear, small plastic cup called a courtesy cup. This internal control, the small plastic cup for nonpaying customers, helps align the accounting system and the theater's operations. A movie theater does not use a system to directly account for the sale of popcorn, soda, or ice used. Instead, it accounts for the containers. A point-of-sale system compares the number of soda cups used in a shift to the number of sales recorded in the system to ensure that those numbers match. The same process accounts for popcorn buckets and other containers. Providing a courtesy cup ensures that customers drinking free water do not use the soda cups that would require a corresponding sale to appear in the point-of-sale system. The cost of the popcorn, soda, and ice will be recorded in the accounting system as an

inventory item, but the internal control is the comparison of the recorded sales to the number of containers used. This is just one type of internal control. As we discuss the internal controls, we see that the internal controls are used both in accounting, to provide information for management to properly evaluate the operations of the company, and in business operations, to reduce fraud.

It should be clear how important internal control is to all businesses, regardless of size. An effective internal control system allows a business to monitor its employees, but it also helps a company protect sensitive customer data. Consider the 2017 massive data breach at **Equifax** that compromised data of over 143 million people. With proper internal controls functioning as intended, there would have been protective measures to ensure that no unauthorized parties had access to the data. Not only would internal controls prevent outside access to the data, but proper internal controls would protect the data from corruption, damage, or misuse.

YOUR TURN

Bank Fraud in Enid, Oklahoma

The retired mayor of Enid, Oklahoma, Ernst Currier, had a job as a loan officer and then as a senior vice president at **Security National Bank**. In his bank job, he allegedly opened 61 fraudulent loans. He used the identities of at least nine real people as well as eight fictitious people and stole about $6.2 million.[1] He was sentenced to 13 years in prison on 33 felony counts.

Currier was able to circumvent one of the most important internal controls: segregation of duties. The American Institute

of Certified Public Accountants (AICPA) states that segregation of duties "is based on shared responsibilities of a key process that disperses the critical functions of that process to more than one person or department. Without this separation in key processes, fraud and error risks are far less manageable."[2] Currier used local residents' identities and created false documents to open loans for millions of dollars and then collect the funds himself, without any oversight by any other employee. Creating these loans allowed him to walk up to the bank vault and take cash out of the bank without anyone questioning him. There was no segregation of duties for opening loans, or if there was, he was able to easily override those internal controls.

How could internal controls have helped prevent Currier's bank fraud in Enid, Oklahoma?

Solution

Simply having someone else confirm the existence of the borrower and make the payment for the loan directly to the borrower would have saved this small bank millions of dollars.

Consider a bank that has to track deposits for thousands of customers. If a fire destroys the building housing the bank's servers, how can the bank find the balances of each customer? Typically, organizations such as banks mirror their servers at several locations around the world as an internal control. The bank might have a main server in Tennessee but also mirror all data in real time to identical servers in Arizona, Montana, and even offshore in Iceland. With multiple copies of a server at multiple locations across the country, or even the world, in the event of disaster to one server, a backup server can take control of operations, protecting customer data and avoiding any service interruptions.

Internal controls are the basic components of an internal control system, the sum of all internal controls and policies

within an organization that protect assets and data. A properly designed system of internal controls aims to ensure the integrity of assets, allows for reliable accounting information and financial reporting, enhances efficiency within an organization, and provides guidelines and possible consequences for dealing with breaches. Internal controls drive many decisions and overall operational procedures within an organization. A properly designed internal control system will not prevent all loss from occurring, but it will significantly reduce the risk of loss and increase the chance of identifying the responsible party.

The Role of Internal Controls

The accounting system is the backbone of any business entity, whether it is profit based or not. It is the responsibility of management to link the accounting system with other functional areas of the business and ensure that there is communication among employees, managers, customers, suppliers, and all other internal and external users of financial information. With a proper understanding of internal controls, management can design an internal control system that promotes a positive business environment that can most effectively serve its customers.

For example, a customer enters a retail store to purchase a pair of jeans. As the cashier enters the jeans into the point-of-sale system, the following events occur internally:

1. A sale is recorded in the company's journal, which increases revenue on the income statement. If the transaction occurred by credit card, the bank typically transfers the funds into the store's bank account in a timely manner.
2. The pair of jeans is removed from the inventory of the

store where the purchase was made.
3. A new pair of jeans is ordered from the distribution center to replace what was purchased from the store's inventory.
4. The distribution center orders a new pair of jeans from the factory to replace its inventory.
5. Marketing professionals can monitor over time the trend and volume of jeans sold in a specific size. If an increase or decrease in sales volume of a specific size is noted, store inventory levels can be adjusted.
6. The company can see in real time the exact inventory levels of all products in all stores at all times, and this can ensure the best customer access to products.

Because many systems are linked through technology that drives decisions made by many stakeholders inside and outside of the organization, internal controls are needed to protect the integrity and ensure the flow of information. An internal control system also assists all stakeholders of an organization to develop an understanding of the organization and provide assurance that all assets are being used efficiently and accurately.

Environment Leading to the Sarbanes-Oxley Act

Internal controls have grown in their importance as a component of most business decisions. This importance has grown as many company structures have grown in complexity. Despite their importance, not all companies have given maintenance of controls top priority. Additionally, many small businesses do not have adequate understanding of internal controls and therefore use inferior internal control systems. Many large companies have nonformalized processes, which can lead to systems that are not as efficient as they could

be. The failure of the **SCICAP Credit Union** discussed earlier is a direct result of a small financial institution having a substandard internal control system leading to employee theft. One of the largest corporate failures of all time was **Enron**, and the failure can be directly attributed to poor internal controls.

Enron was one of the largest energy companies in the world in the late twentieth century. However, a corrupt management attempted to hide weak financial performance by manipulating revenue recognition, valuation of assets on the balance sheet, and other financial reporting disclosures so that the company appeared to have significant growth. When this practice was uncovered, the owners of **Enron** stock lost $40 billion as the stock price dropped from $91 per share to less than $1 per share, as shown in Figure 4.3.[3] This failure could have been prevented had proper internal controls been in place.

For example, **Enron** and its accounting firm, **Arthur Andersen**, did not maintain an adequate degree of independence. **Arthur Andersen** provided a significant amount of services in both auditing and consulting, which prevented them from approaching the audit of **Enron** with a proper degree of independence. Also, among many other violations, **Enron** avoided the proper use of several acceptable reporting requirements.

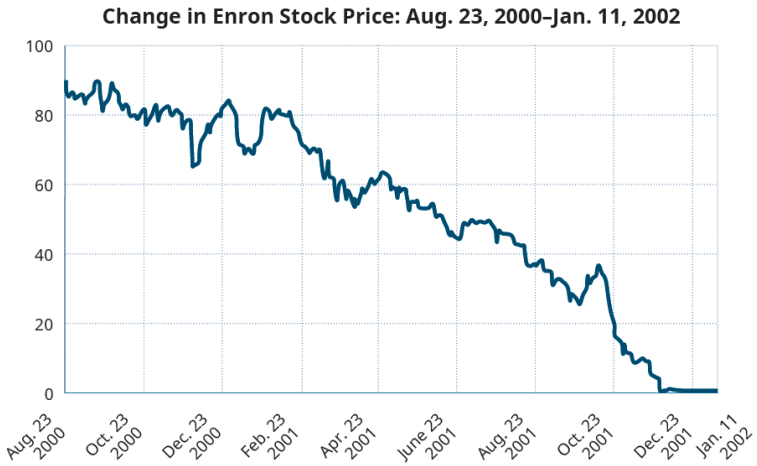


Figure 4.3 Change in Enron Stock Price *The Enron scandal was one of the largest frauds in the history of modern business. It was the main fraud that was responsible for creation of the Sarbanes-Oxley Act as well as the Public Company Accounting Oversight Board (PCAOB). Change in Enron Stock Price. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

As a result of the **Enron** failure and others that occurred during the same time frame, Congress passed the Sarbanes-Oxley Act (SOX) to regulate practice to manage conflicts of analysts, maintain governance, and impose guidelines for criminal conduct as well as sanctions for violations of conduct. It ensures that internal controls are properly documented, tested, and used consistently. The intent of the act was to ensure that corporate financial statements and disclosures are accurate and reliable. It is important to note that SOX only applies to public companies. A publicly traded company is one whose stock is traded (bought and sold) on an organized stock exchange. Smaller companies still struggle with internal control development and compliance due to a variety of reasons, such as cost and lack of resources.

Major Accounting Components of the Sarbanes-Oxley Act

As it pertains to internal controls, the SOX requires the certification and documentation of internal controls. Specifically, the act requires that the auditor do the following:

1. Issue an internal control report following the evaluation of internal controls.
2. Limit nonaudit services, such as consulting, that are provided to a client.
3. Rotate who can lead the audit. The person in charge of the audit can serve for a period of no longer than seven years without a break of two years.

Additionally, the work conducted by the auditor is to be overseen by the Public Company Accounting Oversight Board (PCAOB). The PCAOB is a congressionally established, nonprofit corporation. Its creation was included in the Sarbanes-Oxley Act of 2002 to regulate conflict, control disclosures, and set sanction guidelines for any violation of regulations. The PCAOB was assigned the responsibilities of ensuring independent, accurate, and informative audit reports, monitoring the audits of securities brokers and dealers, and maintaining oversight of the accountants and accounting firms that audit publicly traded companies.

Any employee found to violate SOX standards can be subject to very harsh penalties, including $5 million in fines and up to 20 to 25 years in prison. The penalty is more severe for securities fraud (25 years) than for mail or wire fraud (20 years).

The SOX is relatively long and detailed, with Section 404 having the most application to internal controls. Under Section 404, management of a company must perform annual audits to assess and document the effectiveness of all internal controls that have an impact on the financial reporting of the

organization. Also, selected executives of the firm under audit must sign the audit report and state that they attest that the audit fairly represents the financial records and conditions of the company.

The financial reports and internal control system must be audited annually. The cost to comply with this act is very high, and there is debate as to how effective this regulation is. Two primary arguments that have been made against the SOX requirements is that complying with their requirements is expensive, both in terms of cost and workforce, and the results tend not to be conclusive. Proponents of the SOX requirements do not accept these arguments.

One available potential response to mandatory SOX compliance is for a company to decertify (remove) its stock for trade on the available stock exchanges. Since SOX affects publicly traded companies, decertifying its stock would eliminate the SOX compliance requirement. However, this has not proven to be a viable option, primarily because investors enjoy the protection SOX provides, especially the requirement that the companies in which they invest undergo a certified audit prepared by CPAs employed by national or regional accounting firms. Also, if a company takes its stock off of an organized stock exchange, many investors assume that a company is in trouble financially and that it wants to avoid an audit that might detect its problems.

YOUR TURN

The Growing Importance of the Report on Internal Controls

Internal controls have become an important aspect of financial reporting. As part of the financial statements, the auditor has to issue a report with an opinion on the financial statements, as well as internal controls. Use the internet and locate the annual report of a company, specifically the report on internal controls. What does this report tell the user of financial information?

Solution

The annual report informs the user about the financial results of the company, both in discussion by management as well as the financial statements. Part of the financial statements involves an independent auditor's report on the integrity of the financial statements as well as the internal controls.

Footnotes

- 1 Jack Money. "Fraudulent Loans Lead to Enid Banker's Arrest on Numerous Felony Complaints." *The Oklahoman*. November 15, 2017. https://newsok.com/article/5572195/fraudulent-loans-lead-to-enid-bankers-arrest-on-numerous-felony-complaints
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4.3 Elements of Internal Control

The use of internal controls differs significantly across organizations of different sizes. In the case of small businesses, implementation of internal controls can be a challenge, due to cost constraints, or because a small staff may mean that one manager or owner will have full control over the organization and its operations. An owner in charge of all functions has enough knowledge to keep a close eye on all aspects of the organization and can track all assets appropriately. In smaller organizations in which responsibilities are delegated, procedures need to be developed in order to ensure that assets are tracked and used properly.

When an owner cannot have full oversight and control over an organization, internal control systems need to be developed. When an appropriate internal control system is in place, it is interlinked to all aspects of the entity's operations. An appropriate internal control system links the accounting, finance, operations, human resources, marketing, and sales departments within an organization. It is important that the management team, as well as employees, recognize the importance of internal controls and their role in preventing losses, monitoring performance, and planning for the future.

Elements of Internal Control

A strong internal control system is based on the same consistent elements:

- establishment of clear responsibilities

- proper documentation
- adequate insurance
- separation of assets from custody
- separation of duties
- use of technology

Establishment of Clear Responsibilities

A properly designed system of internal control clearly dictates responsibility for certain roles within an organization. When there is a clear statement of responsibility, issues that are uncovered can be easily traced and responsibility placed where it belongs.

As an example, imagine that you are the manager of the Galaxy's Best Yogurt. On any shift, you have three employees working in the store. One employee is designated as the shift supervisor who oversees the operations of the other two employees on the shift and ensures that the store is presented and functioning properly. Of the other two employees, one may be solely responsible for management of the cash register, while the others serve the customers. When only one employee has access to an individual cash register, if there is an overage or shortage of cash, it can be traced to the one employee who is in charge of the cash register.

Proper Documentation

An effective internal control system maintains proper documentation, including backups, to trace all transactions. The documentation can be paper copies, or documents that are computer generated and stored, on flash drives or in the cloud, for example. Given the possibility of some type of natural

(tornado or flood) or man-made (arson) disasters, even the most basic of businesses should create backup copies of documentation that are stored off-site.

In addition, any documentation generated by daily operations should be managed according to internal controls. For example, when the Galaxy's Best Yogurt closes each day, one employee should close out and reconcile the cash drawer using prenumbered forms in pen to ensure that no forms can be altered or changed by another employee who may have access to the cash. In case of an error, the employee responsible for making the change should initial any changes on the form. If there are special orders for cakes or other products, the order forms should be prenumbered. The use of prenumbered documents provides assurance that all sales are recorded. If a form is not prenumbered, an order can be prepared, and the employee can then take the money without ringing the order into the cash register, leaving no record of the sale.

Adequate Insurance

Insurance may be a significant cost to an organization (especially liability coverage), but it is necessary. With adequate insurance on an asset, if it is lost or destroyed, an outside party will recoup the company for the loss. If assets are lost to fraud or theft, an insurance company will investigate the loss and will press criminal charges against any employee found to be involved. Very often, the employer will be hesitant to pursue criminal charges against an employee due to the risk of lawsuit or bad publicity. For example, an employee might assume that the termination was age related and is going to sue the company. Also, there might be a situation where the company experienced a loss, such as theft, and it does not want to let the

general public know that there are potential deficiencies in its security system.

If the insurance company presses charges on behalf of the company, this protects the organization and also acts as a deterrent if employees know that the insurance company will always prosecute theft. For example, suppose the manager of the Galaxy's Best Yogurt stole $10,000 cash over a period of two years. The owner of the yogurt store will most likely file an insurance claim to recover the $10,000 that was stolen. With proper insurance, the insurance company will reimburse the yogurt store for the money but then has the right to press charges and recover its losses from the employee who was caught stealing. The store owner will have no control over the insurance company's efforts to recover the $10,000 and will likely be forced to fire the employee in order to keep the insurance policy.

Separation of Assets from Custody

Separation of assets from custody ensures that the person who controls an asset cannot also keep the accounting records. This action prevents one employee from taking income from the business and entering a transaction on the accounting records to cover it up. For example, one person within an organization may open an envelope that contains a check, but a different person would enter the check into the organization's accounting system. In the case of the Galaxy's Best Yogurt, one employee may count the money in the cash register drawer at the end of the night and reconcile it with the sales, but a different employee would recount the money, prepare the bank deposit, and ensure that the deposit is made at the bank.

Separation of Duties

A properly designed internal control system assures that at least two (if not more) people are involved with most transactions. The purpose of separating duties is to ensure that there is a check and balance in place. One common internal control is to have one employee place an inventory order and a different employee receive the order as it is delivered. For example, assume that an employee at the Galaxy's Best Yogurt places an inventory order. In addition to the needed inventory, the employee orders an extra box of piecrusts. If that employee also receives the order, he or she can take the piecrusts home, and the store will still pay for them. Check signing is another important aspect of separation of duties. Typically, the person who writes a check should not also sign the check. Additionally, the person who places supply orders should not write checks to pay the bills for these supplies.

Use of Technology

Technology has made the process of internal control simpler and more approachable to all businesses. There are two reasons that the use of technology has become more prevalent. The first is the development of more user-friendly equipment, and the second is the reduction in costs of security resources. In the past, if a company wanted a security system, it often had to go to an outside security firm, and the costs of providing and monitoring the system were prohibitive for many small businesses. Currently, security systems have become relatively inexpensive, and not only do many small businesses now have them, they are now commonly used by residential homeowners.

In terms of the application of security resources, some

businesses use surveillance cameras focused on key areas of the organization, such as the cash register and areas where a majority of work is performed. Technology also allows businesses to use password protection on their data or systems so that employees cannot access systems and change data without authorization. Businesses may also track all employee activities within an information technology system.

Even if a business uses all of the elements of a strong internal control system, the system is only as good as the oversight. As responsibilities, staffing, and even technology change, internal control systems need to be constantly reviewed and refined. Internal control reviews are typically not conducted by inside management but by internal auditors who provide an impartial perspective of where controls are working and where they can be improved.

Purposes of Internal Controls within a Governmental Entity

Internal controls apply not only to public and private corporations but also to governmental entities. Often, a government controls one of the most important assets of modern times: data. Unprotected financial information, including tax data, social security, and governmental identifications, could lead to identity theft and could even provide rogue nations access to data that could compromise the security of our country. Governmental entities require their contractors to have proper internal controls and to maintain proper codes of ethics.

Purposes of Internal Controls within a Not-for-Profit

Not-for-profit (NFP) organizations have the same needs for internal control as many traditional for-profit entities. At the same time, there are unique challenges that these entities face. Based on the objectives and charters of NFP organizations, in many cases, those who run the organizations are volunteers. As volunteers, leaders of NFPs may not have the same training background and qualifications as those in a similar for-profit position. Additionally, a volunteer leader often splits time between the organization and a full-time career. For these reasons, internal controls in an NFP often are not properly implemented, and there may be a greater risk of control lapse. A control lapse occurs when there is a deviation from standard control protocol that leads to a failure in the internal control and/or fraud prevention processes or systems. A failure occurs in a situation when results did not achieve predetermined goals or meet expectations.

Not-for-profit organizations have an extra category of finances that need protection, in addition to their assets. They need to ensure that incoming donations are used as intended. For example, many colleges and universities are classified as NFP organizations, and donations are a significant source of revenue. However, donations are often directed to a specific source. For example, suppose an alumnus of Alpha University wants to make a $1,000,000 donation to the business school for undergraduate student scholarships. Internal controls would track that donation to ensure it paid for scholarships for undergraduate students in the business school and was not used for any other purpose at the school, in order to avoid potential legal issues.

Identify and Apply Principles of Internal Controls to the Receipt and Disbursement of Cash

Cash can be a major part of many business operations. Imagine a Las Vegas casino, or a large grocery store, such as **Publix Super Markets**, **Wegmans Food Markets**, or **ShopRite**; in any of these settings, millions of dollars in cash can change hands within a matter of minutes, and it can pass through the hands of thousands of employees. Internal controls ensure that all of this cash reaches the bank account of the business entity. The first control is monitoring. Not only are cameras strategically placed throughout the store to prevent shoplifting and crime by customers, but cameras are also located over all areas where cash changes hands, such as over every cash register, or in a casino over every gaming table. These cameras are constantly monitored, often offsite at a central location by personnel who have no relationship with the employees who handle the cash, and all footage is recorded. This close monitoring makes it more difficult for misuse of cash to occur.

Additionally, access to cash is tightly controlled. Within a grocery store, each employee has his or her own cash drawer with a set amount of cash. At any time, any employee can reconcile the sales recorded within the system to the cash balance that should be in the drawer. If access to the drawer is restricted to one employee, that employee is responsible when cash is missing. If one specific employee is consistently short on cash, the company can investigate and monitor the employee closely to determine if the shortages are due to theft or if they are accidental, such as if they resulted from errors in counting change. Within a casino, each time a transaction occurs and when there is a shift change for the dealers, cash is counted in real time. Casino employees dispersed on the

gaming floor are constantly monitoring play, in addition to those monitoring cameras behind the scenes.

Technology plays a major role in the maintenance of internal controls, but other principles are also important. If an employee makes a mistake involving cash, such as making an error in a transaction on a cash register, the employee who made the mistake typically cannot correct the mistake. In most cases, a manager must review the mistake and clear it before any adjustments are made. These changes are logged to ensure that managers are not clearing mistakes for specific employees in a pattern that could signify collusion, which is considered to be a private cooperation or agreement primarily for a deceitful, illegal, or immoral cause or purpose. Duties are also separated to count cash on hand and ensure records are accurate. Often, at the end of the shift, a manager or employee other than the person responsible for the cash is responsible for counting cash on hand within the cash drawer. For example, at a grocery store, it is common for an employee who has been checking out customers for a shift to then count the money in the register and prepare a document providing the counts for the shift. This employee then submits the counted tray to a supervisor, such as a head cashier, who then repeats the counting and documentation process. The two counts should be equal. If there is a discrepancy, it should immediately be investigated. If the store accepts checks and credit/debit card payments, these methods of payments are also incorporated into the verification process.

In many cases, the sales have also been documented either by a paper tape or by a computerized system. The ultimate goal is to determine if the cash, checks, and credit/debit card transactions equal the amount of sales for the shift. For example, if the shift's register had sales of $800, then the documentation of counted cash and checks, plus the credit/debit card documentation should also add up to $800.

Despite increased use of credit cards by consumers, our

economy is still driven by cash. As cash plays a very important role in society, efforts must be taken to control it and ensure that it makes it to the proper areas within an organization. The cost of developing, maintaining, and monitoring internal controls is significant but important. Considering the millions of dollars of cash that can pass through the hands of employees on any given day, the high cost can be well worth it to protect the flow of cash within an organization.

4.4 SOX & Management's Responsibility for Maintaining Control

Because internal controls do protect the integrity of financial statements, large companies have become highly regulated in their implementation. In addition to Section 404 of the SOX, which addresses reporting and testing requirements for internal controls, there are other sections of the act that govern management responsibility for internal controls. Although the auditor reviews internal controls and advises on the improvement of controls, ultimate responsibility for the controls is on the management of the company. Under SOX Section 302, in order to provide additional assurance to the financial markets, the chief executive officer (CEO), who is the executive within a company with the highest-ranking title and the overall responsibility for management of the company, and the chief financial officer (CFO), who is the corporation officer who reports to the CEO and oversees all of the accounting and finance concerns of a company, must personally certify that (1) they have reviewed the internal control report provided by the auditor; (2) the report does not contain any inaccurate information; and (3) they believe that all financial information fairly states the financial conditions, income, and cash flows of the entity. The sign-off under Section 302 makes the CEO and CFO personally responsible for financial reporting as well as internal control structure.

While the executive sign-offs seem like they would be just a formality, they actually have a great deal of power in court

cases. Prior to SOX, when an executive swore in court that he or she was not aware of the occurrence of some type of malfeasance, either committed by his or her firm or against his or her firm, the executive would claim a lack of knowledge of specific circumstances. The typical response was, "I can't be expected to know everything." In fact, in virtually all of the trials involving potential malfeasance, this claim was made and often was successful in a not-guilty verdict.

The initial response to the new SOX requirements by many people was that there was already sufficient affirmation by the CEO and CFO and other executives to the accuracy and fairness of the financial statements and that the SOX requirements were unnecessary. However, it was determined that the SOX requirements provided a degree of legal responsibility that previously might have been assumed but not actually stated.

Even if a company is not public and not governed by the SOX, it is important to note that the tone is set at the managerial level, called the *tone at the top*. If management respects the internal control system and emphasizes the importance of maintaining proper internal controls, the rest of the staff will follow and create a cohesive environment. A proper tone at the top demonstrates management's commitment toward openness, honesty, integrity, and ethical behavior.

YOUR TURN

Defending the Sarbanes-Oxley Act

You are having a conversation with the CFO of a public company. Imagine that the CFO complains that there is no benefit to Sections 302 and 404 of the Sarbanes-Oxley Act relative to the cost, as "our company has always valued internal

controls before this regulation and never had an issue." He believes that this regulation is an unnecessary overstep. How would you respond and defend the need for Sections 302 and 404 of the Sarbanes-Oxley Act?

Solution

I would tell the CFO the following:

1. Everyone says that they have always valued internal controls, even those who did not.
2. Better security for the public is worth the cost.
3. The cost of compliance is more than recovered in the company's market price for its stock.

Financial statements are the end result of an accountant's work and are the responsibility of management. Proper internal controls help the accountant determine that the financial statements fairly present the financial position and performance of a company. Financial statement fraud occurs when the financial statements are used to conceal the actual financial condition of a company or to hide specific transactions that may be illegal. Financial statement fraud may take on many different methods, but it is generally called cooking the books. This issue may occur for many purposes.

A common reason to cook the books is to create a false set of a company's books used to convince investors or lenders to provide money to the company. Investors and lenders rely on a properly prepared set of financial statements in making their decision to provide the company with money. Another reason to misstate a set of financial statements is to hide corporate looting such as excessive retirement perks of top executives, unpaid loans to top executives, improper stock options, and any other wrongful financial action. Yet another reason to misreport a company's financial data is to drive the stock price higher. Internal controls assist the accountant in locating and

identifying when management of a company wants to mislead the inventors or lenders.

The financial accountant or members of management who set out to cook the books are intentionally attempting to deceive the user of the financial statements. The actions of upper management are being concealed, and in most cases, the entire financial position of the company is being purposely misreported. Regardless of the reason for misstating the true condition of a company's financial position, doing so misleads any person using the financial statements of a company to evaluate the company and its operations.

How Companies Cook the Books to Misrepresent Their Financial Condition

One of the most common ways companies cook the books is by manipulating revenue accounts or accounts receivables. Proper revenue recognition involves accounting for revenue when the company has met its obligation on a contract. Financial statement fraud involves early revenue recognition, or recognizing revue that does not exist, and receivable accountings, used in tandem with false revenue reporting. **HealthSouth** used a combination of false revenue accounts and misstated accounts receivable in a direct manipulation of the revenue accounts to commit a multibillion-dollar fraud between 1996 and 2002. Several chief financial officers and other company officials went to prison as a result.[4]

CONCEPTS IN PRACTICE

Internal Controls at HealthSouth

The fraud at **HealthSouth** was possible because some of the internal controls were ignored. The company failed to maintain standard segregation of duties and allowed management override of internal controls. The fraud required the collusion of the entire accounting department, concealing hundreds of thousands of fraudulent transactions through the use of falsified documents and fraudulent accounting schemes that included revenue recognition irregularities (such as recognizing accounts receivables to be recorded as revenue before collection), misclassification of expenses and asset acquisitions, and fraudulent merger and acquisition accounting. The result was billions of dollars of fraud. Simply implementing and following proper internal control procedures would have stopped this massive fraud.[5]

Many companies may go to great lengths to perpetuate financial statement fraud. Besides the direct manipulation of revenue accounts, there are many other ways fraudulent companies manipulate their financial statements. Companies with large inventory balances can misrepresent their inventory account balances and use this misrepresentation to overstate the amount of their assets to get larger loans or use the increased balance to entice investors through claims of exaggerated revenues. The inventory accounts can also be used to overstate income. Such inventory manipulations can include the following:

- Channel stuffing: encouraging customers to buy products under favorable terms. These terms include allowing the customer to return or even not pick up goods sold,

without a corresponding reserve to account for the returns.
- Sham sales: sales that have not occurred and for which there are no customers.
- Bill-and-hold sales: recognition of income before the title transfers to the buyer, and holding the inventory in the seller's warehouse.
- Improper cutoff: recording sales of inventory in the wrong period and before the inventory is sold; this is a type of early revenue recognition.
- Round-tripping: selling items with the promise to buy the items back, usually on credit, so there is no economic benefit.

These are just a few examples of the way an organization might manipulate inventory or sales to create false revenue.

One of the most famous financial statement frauds involved **Enron**, as discussed previously. **Enron** started as an interstate pipeline company, but then branched out into many different ventures. In addition to the internal control deficiencies discussed earlier, the financial statement fraud started when the company began to attempt to hide its losses.

The fraudulent financial reporting schemes included building assets and immediately taking as income any projected profits on construction and hiding the losses from operating assets in an off-the-balance sheet transaction called special purpose entities, which are separate, often complicated legal entities that are often used to absorb risk for a corporation. **Enron** moved assets that were losing money off of its books and onto the books of the Special Purpose Entity. This way, **Enron** could hide its bad business decisions and continue to report a profit, even though its assets were losing money. **Enron**'s financial statement fraud created false revenues with the misstatement of assets and liability balances. This was further supported by inadequate balance

sheet footnotes and the related disclosures. For example, required disclosures were ramped up as a result of these special purpose entities.

Sarbanes-Oxley Act Compliance Today

The **Enron** scandal and related financial statement frauds led to investors requiring that public companies maintain better internal controls and develop stronger governance systems, while auditors perform a better job at auditing public companies. These requirements, in turn, led to the regulations developed under SOX that were intended to protect the investing public.

Since SOX was first passed, it has adapted to changing technology and now requires public companies to protect their accounting and financial data from hackers and other outside or internal forces through stronger internal controls designed to protect the data. The *Journal of Accountancy* supported these new requirements and reported that the results of SOX have been positive for both companies and investors.

As discussed in the *Journal of Accountancy* article,[6] there are three conditions that are increasingly affecting compliance with SOX requirements:

- **PCAOB requirements.** The PCAOB has increased the requirements for inspection reports, with a greater emphasis on deficiency evaluation.
- **Revenue recognition**. The Financial Accounting Standards Board has introduced a new standard for revenue recognition. This requirement has led to the need for companies to update control documentation.
- **Cybersecurity**. Cybersecurity is the practice of protecting software, hardware, and data from digital attacks. As would be expected in today's environment, the number of

recent cybersecurity disclosures has significantly grown.

Under current guidelines, instead of the SOX requiring compliance with just the financial component of reporting and internal control, the guidelines now allow application to information technology (IT) activities as well. A major change under the SOX guidelines involves the method of storage of a company's electronic records. While the act did not specifically require a particular storage method, it did provide guidance on which records were to be stored and for how long they should be stored.

The SOX now requires that all business records, electronic records, and electronic messages must be stored for at least five years. The penalties for noncompliance include either imprisonment or fines, or a combination of the two options.

Footnotes

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CHAPTER 5- LIABILITIES & EQUITY

Liabilities.... who do we owe?

5.1 Current Liabilities

To assist in understanding current liabilities, assume that you own a landscaping company that provides landscaping maintenance services to clients. As is common for landscaping companies in your area, you require clients to pay an initial deposit of 25% for services before you begin working on their property. Asking a customer to pay for services before you have provided them creates a current liability transaction for your business. As you've learned, liabilities require a future disbursement of assets or services resulting from a prior business activity or transaction. For companies to make more informed decisions, liabilities need to be classified into two specific categories: current liabilities and noncurrent (or long-term) liabilities. The differentiating factor between current and long-term is when the liability is due.

Fundamentals of Current Liabilities

A current liability is a debt or obligation due within a company's standard operating period, typically a year, although there are exceptions that are longer or shorter than a year. A company's typical operating period (sometimes called an operating cycle) is a year, which is used to delineate current and noncurrent liabilities, and current liabilities are considered short term and are typically due within a year or less.

Noncurrent liabilities are long-term obligations with payment typically due in a subsequent operating period. Current liabilities are reported on the classified balance sheet, listed before noncurrent liabilities. Changes in current liabilities from the beginning of an accounting period to the end are reported on the statement of cash flows as part of the cash

flows from operations section. An increase in current liabilities over a period increases cash flow, while a decrease in current liabilities decreases cash flow.

Table 5.1 A delineator between current and noncurrent liabilities is one year or the company's operating period, whichever is longer. By: Rice University OpenStax CC BY-NC-SA 4.0

Current Liabilities	Noncurrent Liabilities
Due within one year or less for a typical one-year operating period	Due in more than one year or longer than one operating period
Short-term accounts such as: • Accounts Payable • Salaries Payable • Unearned Revenues • Interest Payable • Taxes Payable • Notes Payable within one operating period • Current portion of a longer-term account such as Notes Payable or Bonds Payable	Long-term portion of obligations such as: • Noncurrent portion of a longer-term account such as Notes Payable or Bonds Payable

Examples of Current Liabilities

Common current liabilities include accounts payable, unearned revenues, the current portion of a note payable, and taxes payable. Each of these liabilities is current because it results from a past business activity, with a disbursement or payment due within a period of less than a year.

Accounts Payable

Accounts payable accounts for financial obligations owed to suppliers after purchasing products or services on credit. This

account may be an open credit line between the supplier and the company. An open credit line is a borrowing agreement for an amount of money, supplies, or inventory. The option to borrow from the lender can be exercised at any time within the agreed time period.

An account payable is usually a less formal arrangement than a promissory note for a current note payable. Long-term debt is covered in depth in An invoice from the supplier (such as the one shown in Figure 5.1) detailing the purchase, credit terms, invoice date, and shipping arrangements will suffice for this contractual relationship. In many cases, accounts payable agreements do not include interest payments, unlike notes payable. Long-Term Liabilities. For now, know that for some debt, including short-term or current, a formal contract might be created. This contract provides additional legal protection for the lender in the event of failure by the borrower to make timely payments. Also, the contract often provides an opportunity for the lender to actually sell the rights in the contract to another party.

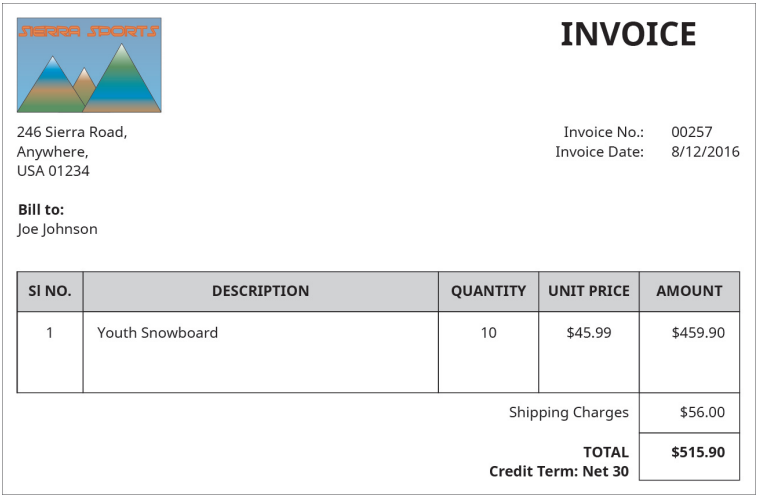


Figure 5.1 Accounts Payable *Contract terms for accounts payable transactions are usually listed on an invoice. Accounts Payable. By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

For example, assume the owner of a clothing boutique purchases hangers from a manufacturer on credit. The organizations may establish an ongoing purchase agreement, which includes purchase details (such as hanger prices and quantities), credit terms (2/10, n/60), an invoice date, and shipping charges (free on board [FOB] shipping) for each order.

On August 1, Sierra Sports purchases $12,000 of soccer equipment from a manufacturer (supplier) on credit. Assume for the following examples that Sierra Sports uses the perpetual inventory method, which uses the Inventory account when the company buys, sells, or adjusts the inventory balance, such as in the following example where they qualified for a discount. In the current transaction, credit terms are 2/10, n/30, the invoice date is August 1, and shipping charges are FOB shipping point (which is included in the purchase cost).

Recall that credit terms of 2/10, n/30 signal the payment terms and discount, and FOB shipping point establishes the point of merchandise ownership, the responsibility during transit, and which entity pays shipping charges. Therefore, 2/10, n/30 means Sierra Sports has ten days to pay its balance due to receive a 2% discount, otherwise Sierra Sports has net thirty days, in this case August 31, to pay in full but not receive a discount. FOB shipping point signals that since Sierra Sports takes ownership of the merchandise when it leaves the manufacturer, it takes responsibility for the merchandise in transit and will pay the shipping charges.

Sierra Sports would make the following journal entry on August 1.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 1	Inventory	12,000	
	Accounts Payable		12,000
	To recognize the purchase of equipment on credit, terms 2/10, n/30, invoice date Aug. 1		

Figure 5.2 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The merchandise is purchased from the supplier on credit. In this case, Accounts Payable would increase (a credit) for the full amount due. Inventory, the asset account, would increase (a debit) for the purchase price of the merchandise.

If Sierra Sports pays the full amount owed on August 10, it qualifies for the discount, and the following entry would occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 10	Accounts Payable	12,000	
	Inventory		240
	Cash		11,760
	To recognize payment of the amount due, less discount		

Figure 5.3 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Assume that the payment to the manufacturer occurs within the discount period of ten days (2/10, n/30) and is recognized in the entry. Accounts Payable decreases (debit) for the original amount due, Inventory decreases (credit) for the discount amount of $240 ($12,000 × 2%), and Cash decreases (credit) for the remaining balance due after discount.

Note that Inventory is decreased in this entry because the value of the merchandise (soccer equipment) is reduced. When applying the perpetual inventory method, this reduction is required by generally accepted accounting principles (GAAP) (under the cost principle) to reflect the actual cost of the merchandise.

A second possibility is that Sierra will return part of the purchase before the ten-day discount window has expired. Assume in this example that $1,000 of the $12,000 purchase was returned to the seller on August 8 and the remaining account payable due was paid by Sierra to the seller on August 10, which means that Sierra qualified for the remaining eligible discount. The following two journal entries represent the return of inventory and the subsequent payment for the remaining account payable owed. The initial journal entry from August 1

will still apply, because we assume that Sierra intended to keep the full $12,000 of inventory when the purchase was made.

When the $1,000 in inventory was returned on August 8, the accounts payable account and the inventory accounts should be reduced by $1,000 as demonstrated in this journal entry.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 8	Accounts Payable	1,000	
	Inventory		1,000
	To recognize return of inventory purchased		

Figure 5.4 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

After this transaction, Sierra still owed $11,000 and still had $11,000 in inventory from the purchase, assuming that Sierra had not sold any of it yet.

When Sierra paid the remaining balance on August 10, the company qualified for the discount. However, since Sierra only owed a remaining balance of $11,000 and not the original $12,000, the discount received was 2% of $11,000, or $220, as demonstrated in this journal entry. Since Sierra owed $11,000 and received a discount of $220, the supplier was paid $10,780. This second journal entry is the same as the one that would have recognized an original purchase of $11,000 that qualified for a discount.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 8	Accounts Payable	11,000	
	Inventory		220
	Cash		10,780
	To recognize payment of remaining accounts payable balance after qualifying for the discount		

Figure 5.5 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Remember that since we are assuming that Sierra was using the perpetual inventory method, purchases, payments, and

adjustments in goods available for sale are reflected in the company's Inventory account. In our example, one of the potential adjustments is that discounts received are recorded as reductions to the Inventory account.

To demonstrate this concept, after buying $12,000 in inventory, returning $1,000 in inventory, and then paying for the remaining balance and qualifying for the discount, Sierra's Inventory balance increased by $10,780, as shown.

SIERRA SPORTS Inventory Account	
Initial inventory purchase (Aug. 1)	$12,000
Return of inventory (Aug. 8)	(1,000)
Subtotal (Aug. 8)	$11,000
Discount allowed Aug. 10 (reduction in inventory)	(220)
Final Inventory after Account Payable	$10,780

Figure 5.6 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

If Sierra had bought $11,000 of inventory on August 1 and paid cash and taken the discount, after taking the $220 discount, the increase of Inventory on their balance sheet would have been $10,780, as it finally ended up being in our more complicated set of transactions on three different days. The important factor is that the company qualified for a 2% discount on inventory that had a retail price before discounts of $11,000.

In a final possible scenario, assume that Sierra Sports remitted payment outside of the discount window on August 28, but inside of thirty days. In this case, they did not qualify for the discount, and assuming that they made no returns they paid the full, undiscounted balance of $12,000.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 28	Accounts Payable Cash *To recognize payment of the amount due, no discount applied*	12,000	12,000

Figure 5.7 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

If this occurred, both Accounts Payable and Cash decreased by $12,000. Inventory is not affected in this instance because the full cost of the merchandise was paid; so, the increase in value for the inventory was $12,000, and not the $11,760 value determined in our beginning transactions where they qualified for the discount.

Unearned Revenue

Unearned revenue, also known as deferred revenue, is a customer's advance payment for a product or service that has yet to be provided by the company. Some common unearned revenue situations include subscription services, gift cards, advance ticket sales, lawyer retainer fees, and deposits for services. As you learned when studying the accounting cycle, we are applying the principles of accrual accounting when revenues and expenses are recognized in different months or years. Under accrual accounting, a company does not record revenue as earned until it has provided a product or service, thus adhering to the revenue recognition principle. Until the customer is provided an obligated product or service, a liability exists, and the amount paid in advance is recognized in the Unearned Revenue account. As soon as the company provides all, or a portion, of the product or service, the value is then recognized as earned revenue.

For example, assume that a landscaping company provides

services to clients. The company requires advance payment before rendering service. The customer's advance payment for landscaping is recognized in the Unearned Service Revenue account, which is a liability. Once the company has finished the client's landscaping, it may recognize all of the advance payment as earned revenue in the Service Revenue account. If the landscaping company provides part of the landscaping services within the operating period, it may recognize the value of the work completed at that time.

Perhaps at this point a simple example might help clarify the treatment of unearned revenue. Assume that the previous landscaping company has a three-part plan to prepare lawns of new clients for next year. The plan includes a treatment in November 2019, February 2020, and April 2020. The company has a special rate of $120 if the client prepays the entire $120 before the November treatment. In real life, the company would hope to have dozens or more customers. However, to simplify this example, we analyze the journal entries from one customer. Assume that the customer prepaid the service on October 15, 2019, and all three treatments occur on the first day of the month of service. We also assume that $40 in revenue is allocated to each of the three treatments.

Before examining the journal entries, we need some key information. Because part of the service will be provided in 2019 and the rest in 2020, we need to be careful to keep the recognition of revenue in its proper period. If all of the treatments occur, $40 in revenue will be recognized in 2019, with the remaining $80 recognized in 2020. Also, since the customer could request a refund before any of the services have been provided, we need to ensure that we do not recognize revenue until it has been earned. While it is nice to receive funding before you have performed the services, in essence, all you have received when you get the money is a liability (unearned service revenue), with the hope of it eventually becoming revenue. The following journal entries are

built upon the client receiving all three treatments. First, for the prepayment of future services and for the revenue earned in 2019, the journal entries are shown.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 15, 2019	Cash	120	
	Unearned Revenue: Landscaping		120
	To recognize prepayment of future landscaping services		
Nov. 1, 2019	Unearned Revenue: Landscaping	40	
	Earned Revenue: Landscaping		40
	To record landscaping revenue earned		

Figure 5.8 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

For the revenue earned in 2020, the journal entries would be.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Feb. 1, 2020	Unearned Revenue: Landscaping	40	
	Earned Revenue: Landscaping		40
	To record landscaping revenue earned		
Apr. 1, 2020	Unearned Revenue: Landscaping	40	
	Earned Revenue: Landscaping		40
	To record landscaping revenue earned		

Figure 5.9 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*



Figure 5.10 Fans in Razorback Stadium *Advance Ticket Sales. Season ticket sales are considered unearned revenue because customers pay for them in advance of any games played. Fans in Razorback Stadium (Fayetteville, AR). By: Rmcclen Source: wikimediacommons CC BY-NC-SA 4.0*

CONCEPTS IN PRACTICE

Thinking about Unearned Revenue

When thinking about unearned revenue, consider the example of **Amazon.com, Inc**. **Amazon** has a large business portfolio that includes a widening presence in the online product and service space. **Amazon** has two services in particular that contribute to their unearned revenue account: Amazon Web Services and Prime membership.

According to *Business Insider*, **Amazon** had $4.8 billion in unearned revenue recognized in their fourth quarter report (December 2016), with most of that contribution coming from

Amazon Web Services.[1] This is an increase from prior quarters. The growth is due to larger and longer contracts for web services. The advance payment for web services is transferred to revenue over the term of the contract. The same is true for Prime membership. **Amazon** receives $99 in advance pay from customers, which is amortized over the twelve-month period of the service agreement. This means that each month, Amazon only recognizes $8.25 per Prime membership payment as earned revenue.

Sierra Sports has contracted with a local youth football league to provide all uniforms for participating teams. The league pays for the uniforms in advance, and Sierra Sports provides the customized uniforms shortly after purchase. The following situation shows the journal entry for the initial purchase with cash. Assume the league pays Sierra Sports for twenty uniforms (cost per uniform is $30, for a total of $600) on April 3.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 3	Cash	600	
	Unearned Uniform Revenue		600
	To recognize advanced payment for 20 uniforms at $30 each		

Figure 5.11 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Sierra Sports would see an increase to Cash (debit) for the payment made from the football league. The revenue from the sale of the uniforms is $600 (20 uniforms × $30 per uniform). Unearned Uniform Revenue accounts reflect the prepayment from the league, which cannot be recognized as earned revenue until the uniforms are provided. Unearned Uniform Revenue is a current liability account that increases (credit) with the increase in outstanding product debt.

Sierra provides the uniforms on May 6 and records the following entry.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
May 6	Unearned Revenue: Uniforms	600	
	Revenue: Uniforms		600
	To recognize uniform revenue as earned		
May 6	Cost of Goods Sold	280	
	Inventory		280
	To recognize cost of goods sold of uniform sales		

Figure 5.12 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Now that Sierra has provided all of the uniforms, the unearned revenue can be recognized as earned. This satisfies the revenue recognition principle. Therefore, Unearned Uniform Revenue would decrease (debit), and Uniform Revenue would increase (credit) for the total amount.

Let's say that Sierra only provides half the uniforms on May 6 and supplies the rest of the order on June 2. The company may not recognize revenue until a product (or a portion of a product) has been provided. This means only half the revenue can be recognized on May 6 ($300) because only half of the uniforms were provided. The rest of the revenue recognition will have to wait until June 2. Since only half of the uniforms were delivered on May 6, only half of the costs of goods sold would be recognized on May 6. The other half of the costs of goods sold would be recognized on June 2 when the other half of the uniforms were delivered. The following entries show the separate entries for partial revenue recognition.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
May 6	Unearned Revenue: Uniforms	300	
	Revenue: Uniforms		300
	To recognize partial uniform revenue as earned		
May 6	Cost of Goods Sold	140	
	Inventory		140
	To recognize cost of goods sold of uniform sales		
Jun. 2	Unearned Revenue: Uniforms	300	
	Revenue: Uniforms		300
	To recognize partial uniform revenue as earned		
Jun. 2	Cost of Goods Sold	140	
	Inventory		140
	To recognize cost of goods sold of uniform sales		

Figure 5.13 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

In another scenario using the same cost information, assume that on April 3, the league contracted for the production of the uniforms on credit with terms 5/10, n/30. They signed a contract for the production of the uniforms, so an account receivable was created for Sierra, as shown.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 3	Accounts Receivable	600	
	Unearned Revenue: Uniforms		600
	To recognize advanced payment on credit for 20 uniforms (5/10, n/30)		

Figure 5.14 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Sierra and the league have worked out credit terms and a discount agreement. As such, the league can delay cash payment for ten days and receive a discount, or for thirty days with no discount assessed. Instead of cash increasing for Sierra, Accounts Receivable increases (debit) for the amount the football league owes.

The league pays for the uniforms on April 15, and Sierra provides all uniforms on May 6. The following entry shows the payment on credit.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 15	Cash Accounts Receivable *To recognize payment of the amount due; no discount applied*	600	600

Figure 5.15 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The football league made payment outside of the discount period, since April 15 is more than ten days from the invoice date. Thus, they do not receive the 5% discount. Cash increases (debit) for the $600 paid by the football league, and Accounts Receivable decreases (credit).

In the next example, let's assume that the league made payment within the discount window, on April 13. The following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 13	Cash Sales Discount Accounts Receivable *To recognize league payment with 5 percent discount*	570 30	 600

Figure 5.16 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

In this case, Accounts Receivable decreases (credit) for the original amount owed, Sales Discount increases (debit) for the discount amount of $30 ($600 × 5%), and Cash increases (debit) for the $570 paid by the football league less discount.

When the company provides the uniforms on May 6, Unearned Uniform Revenue decreases (debit) and Uniform Revenue increases (credit) for $600.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
May 6	Unearned Revenue: Uniforms	600	
	Revenue: Uniforms		600
	To recognize uniform revenue as earned		

Figure 5.17 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Unearned Revenue Tutorial
Unearned Revenue Interactive Practice

Current Portion of a Note Payable

A note payable is a debt to a lender with specific repayment terms, which can include principal and interest. A note payable has written contractual terms that make it available to sell to another party. The principal on a note refers to the initial borrowed amount, not including interest. In addition to repayment of principal, interest may accrue. Interest is a monetary incentive to the lender, which justifies loan risk.

Let's review the concept of interest. Interest is an expense that you might pay for the use of someone else's money. For example, if you have a credit card and you owe a balance at the end of the month it will typically charge you a percentage, such as 1.5% a month (which is the same as 18% annually) on the balance that you owe. Assuming that you owe $400, your interest charge for the month would be $400 × 1.5%, or $6.00. To pay your balance due on your monthly statement would require $406 (the $400 balance due plus the $6 interest expense).

We make one more observation about interest: interest rates are typically quoted in annual terms. For example, if you borrowed money to buy a car, your interest expense might be quoted as 9%. Note that this is an annual rate. If you are making monthly payments, the monthly charge for interest would be

9% divided by twelve, or 0.75% a month. For example, if you borrowed $20,000, and made sixty equal monthly payments, your monthly payment would be $415.17, and your interest expense component of the $415.17 payment would be $150.00. The formula to calculate interest on either an annual or partial-year basis is:

Interest = Principal (amount borrowed) × Interest Rate × Period of Time

Figure 5.18 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

In our example this would be
$20,000×9%×112=$150

The good news is that for a loan such as our car loan or even a home loan, the loan is typically what is called *fully amortizing*. At this point, you just need to know that in our case the amount that you owe would go from a balance due of $20,000 down to $0 after the twentieth payment and the part of your $415.17 monthly payment allocated to interest would be less each month. For example, your last (sixtieth) payment would only incur $3.09 in interest, with the remaining payment covering the last of the principle owed. See Figure 5.18 for an exhibit that demonstrates this concept.

A note payable is usually classified as a long-term (noncurrent) liability if the note period is longer than one year or the standard operating period of the company. However, during the company's current operating period, any portion of the long-term note due that will be paid in the current period is considered a current portion of a note payable. The outstanding balance note payable during the current period remains a noncurrent note payable. Note that this does not include the interest portion of the payments. On the balance sheet, the current portion of the noncurrent liability is

separated from the remaining noncurrent liability. No journal entry is required for this distinction, but some companies choose to show the transfer from a noncurrent liability to a current liability.

For example, a bakery company may need to take out a $100,000 loan to continue business operations. The bakery's outstanding note principal is $100,000. Terms of the loan require equal annual principal repayments of $10,000 for the next ten years. Payments will be made on July 1 of each of the ten years. Even though the overall $100,000 note payable is considered long term, the $10,000 required repayment during the company's operating cycle is considered current (short term). This means $10,000 would be classified as the current portion of a noncurrent note payable, and the remaining $90,000 would remain a noncurrent note payable.

The portion of a note payable due in the current period is recognized as current, while the remaining outstanding balance is a noncurrent note payable. For example, Figure 5.19 shows that $18,000 of a $100,000 note payable is scheduled to be paid within the current period (typically within one year). The remaining $82,000 is considered a long-term liability and will be paid over its remaining life.

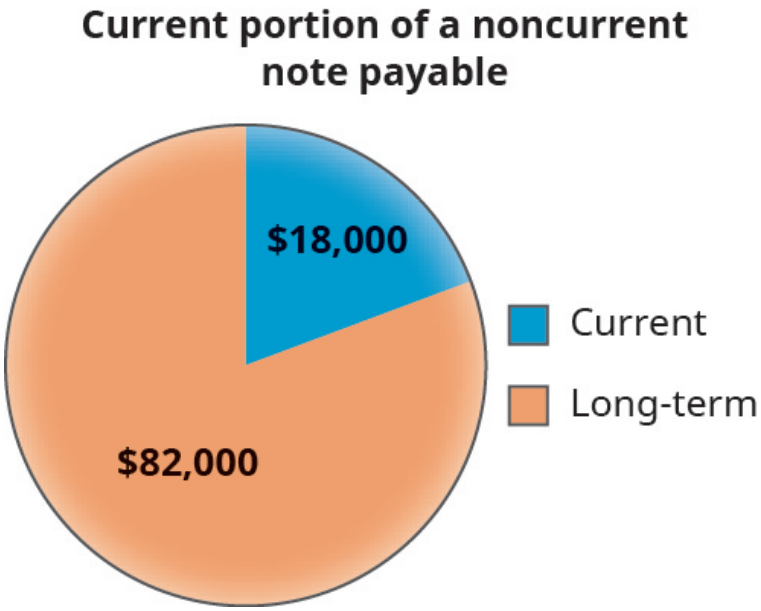


Figure 5.19 Current Portion of a Noncurrent Note Payable *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

In addition to the $18,000 portion of the note payable that will be paid in the current year, any accrued interest on both the current portion and the long-term portion of the note payable that is due will also be paid. Assume, for example, that for the current year $7,000 of interest will be accrued. In the current year the debtor will pay a total of $25,000—that is, $7,000 in interest and $18,000 for the current portion of the note payable. A similar type of payment will be paid each year for as long as any of the note payable remains; however, the annual interest expense would be reduced since the remaining note payable owed will be reduced by the previous payments.

Interest payable can also be a current liability if accrual of interest occurs during the operating period but has yet to be paid. An annual interest rate is established as part of the loan

terms. Interest accrued is recorded in Interest Payable (a credit) and Interest Expense (a debit). To calculate interest, the company can use the following equations. This method assumes a twelve-month denominator in the calculation, which means that we are using the calculation method based on a 360-day year. This method was more commonly used prior to the ability to do the calculations using calculators or computers, because the calculation was easier to perform. However, with today's technology, it is more common to see the interest calculation performed using a 365-day year. We will demonstrate both methods.

$$\text{Interest Payable} = \text{Annual Interest Rate} \times \text{Loan Principal} \times \text{Part of Year}$$

$$\text{Part of Year} = \frac{\text{Number of Months of Accrued Interest}}{\text{12 Months}}$$

Figure 5.20 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

For example, we assume the bakery has an annual interest rate on its loan of 7%. The loan interest began accruing on July 1 and it is now December 31. The bakery has accrued six months of interest and would compute the interest liability as $\$100{,}000 \times 7\% \times \frac{6}{12} = \$3{,}500$

The $3,500 is recognized in Interest Payable (a credit) and Interest Expense (a debit).

Taxes Payable

Taxes payable refers to a liability created when a company collects taxes on behalf of employees and customers or for tax obligations owed by the company, such as sales taxes or income taxes. A future payment to a government agency is

required for the amount collected. Some examples of taxes payable include sales tax and income taxes.

Sales taxes result from sales of products or services to customers. A percentage of the sale is charged to the customer to cover the tax obligation (see Figure 5.21). The sales tax rate varies by state and local municipalities but can range anywhere from 1.76% to almost 10% of the gross sales price. Some states do not have sales tax because they want to encourage consumer spending. Those businesses subject to sales taxation hold the sales tax in the Sales Tax Payable account until payment is due to the governing body.



Figure 5.21 Sales Tax *Many businesses are required to charge a sales tax on products or services sold. Sales Tax. By: Kerry Ceszyk Source: Flickr CC BY 4.0*

For example, assume that each time a shoe store sells a $50

pair of shoes, it will charge the customer a sales tax of 8% of the sales price. The shoe store collects a total of $54 from the customer. The $4 sales tax is a current liability until distributed within the company's operating period to the government authority collecting sales tax.

Income taxes are required to be withheld from an employee's salary for payment to a federal, state, or local authority (hence they are known as *withholding taxes*). This withholding is a percentage of the employee's gross pay.

Let's consider our previous example where Sierra Sports purchased $12,000 of soccer equipment in August. Sierra now sells the soccer equipment to a local soccer league for $18,000 cash on August 20. The sales tax rate is 6%. The following revenue entry would occur.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 20	Cash	19,080	
	Sales Tax Payable		1,080
	Sales		18,000
	To recognize soccer equipment sale, tax rate 6%		

Figure 5.22 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Cash increases (debit) for the sales amount plus sales tax. Sales Tax Payable increases (credit) for the 6% tax rate ($18,000 × 6%). Sierra's tax liability is owed to the State Tax Board. Sales increases (credit) for the original amount of the sale, not including sales tax. If Sierra's customer pays on credit, Accounts Receivable would increase (debit) for $19,080 rather than Cash.

When Sierra remits payment to the State Tax Board on October 1, the following entry occurs.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 1	Sales Tax Payable	1,080	
	Cash		1,080
	To recognize State Tax Board payment		

Figure 5.23 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Sales Tax Payable and Cash decrease for the payment amount of $1,080. Sales tax is not an expense to the business because the company is holding it on account for another entity.

YOUR TURN

Accounting for Purchase Discounts

You own a shipping and packaging facility and provide shipping services to customers. You have worked out a contract with a local supplier to provide your business with packing materials on an ongoing basis. Terms of your agreement allow for delayed payment of up to thirty days from the invoice date, with an incentive to pay within ten days to receive a 5% discount on the packing materials. On April 3, you purchase 1,000 boxes (Box Inventory) from this supplier at a cost per box of $1.25. You pay the amount due to the supplier on April 11. Record the journal entries to recognize the initial purchase on April 3, and payment of the amount due on April 11.

Solution

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Apr. 3	Box Inventory	1,250	
	Accounts Payable		1,250
	To recognize purchases of boxes, 5/10, n/30		
Apr. 11	Accounts Payable	1,250	
	Box Inventory		62.50
	Cash		1,187.50
	To recognize payment, less discount		

Figure 5.24 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Long Descriptions

Invoice document from the company Sierra Sports, located on 246 Sierra Road, Anywhere, USA 01234. Invoice no. is 00257; invoice date is August 12, 2016. Joe Johnson is the customer that is billed. SI NO 1; Description of item is Youth Snowboard, Quantity of 10, Unit Price of $45.99, and the Amount is $459.90. Shipping charges are $56. Total is $515.90. Credit term: Net 30. Return

The first journal entry is made on October 15 in 2019 and shows a Debit to Cash for $120, and a credit to unearned landscape revenue for $120, with the note “to recognize prepayment of future landscaping services.” The second journal entry is made on November 1 in 2019 and shows a debit to unearned landscape revenue for $40, and a credit to Landscaping revenue earned for $40, with the note “to record landscaping revenue earned. Return

The first journal entry is made on February 1 in 2020 and shows a Debit to Unearned landscape revenue for $40, and a credit to Landscaping revenue earned for $40, with the note “To record landscaping revenue earned.” The second journal entry is made on April 1 in 2020 and shows a debit to unearned landscape revenue for $40, and a credit to Landscaping revenue earned for $40, with the note “To record landscaping revenue earned. Return

A journal entry is made on May 6 and shows a Debit to Unearned uniform revenue for $300, and a credit to Uniform revenue for $300, with the note “To recognize partial uniform revenue as earned.” A second journal entry on May 6 shows a Debit to Cost of goods sold for $140, and a credit to Inventory for $140, with the note “To recognize cost of goods sold of uniform sales.” A second journal entry is made on June 2 and shows a Debit to Unearned uniform revenue for $300, and a credit to Uniform revenue for $300, with the note “To recognize partial uniform revenue as earned.” A second journal entry on May 6 shows a Debit to Cost of goods sold for $140, and a credit to Inventory for $140, with the note “To recognize cost of goods sold of uniform sales.” Return

Footnotes

- 1 Eugene Kim. “An Overlooked Part of Amazon Will Be in the Spotlight When the Company Reports Earnings.” *Business Insider*. April 28, 2016. https://www.businessinsider.com/amazon-unearned-revenue-growth-shows-why-it-spent-more-on-shipping-last-quarter-2016-4

5.2 Types of Long-term Funding

Businesses have several ways to secure financing and, in practice, will use a combination of these methods to finance the business. As you've learned, net income does not necessarily mean cash. In some cases, in the long-run, profitable operations will provide businesses with sufficient cash to finance current operations and to invest in new opportunities. However, situations might arise where the cash flow generated is insufficient to cover future anticipated expenses or expansion, and the company might need to secure additional funding.

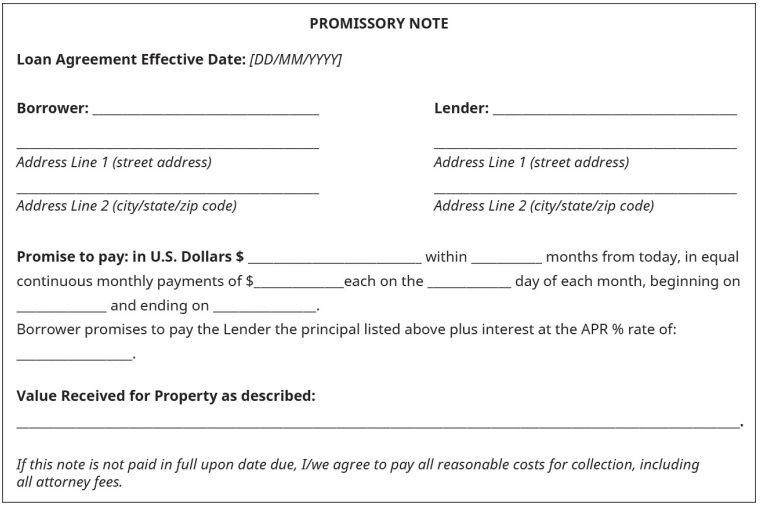
If the extra amount needed is somewhat temporary or small, a short-term source, such as a loan, might be appropriate. When additional long-term funding needs arise, a business can choose to sell stock in the company (equity-based financing) or obtain a long-term liability (debt-based financing), such as a loan that is spread over a period longer than a year.

Types of Long-Term Funding

If a company needs additional funding for a major expenditure, such as expansion, the source of funding would typically be repaid over several years, or in the case of equity-based financing, over an indefinite period of time. With equity-based financing, the company sells an interest in the company's ownership by issuing shares of the company's common stock. This financing option is equity financing, and it will be addressed in detail in the next chapter. Here, we will focus on

two major long-term debt-based options: long-term loans and bonds.

Debt as an option for financing is an important source of funding for businesses. If a company chooses a debt-based option, the business can borrow money on an intermediate (typically two to four years) or long-term (longer than four years) basis from lenders. In the case of bonds, the funds would be provided by investors. While loans and bonds are similar in that they borrow money on which the borrower will pay interest and eventually repay the lenders, they have some important differences. First, a company can raise funds by borrowing from an individual, bank, or other lender, while a bond is typically sold to numerous investors. When a company chooses a loan, the business signs what is known as a note, and a legal relationship called a note payable is created between the borrower and the lender. The document lists the conditions of the financial arrangement, a fixed predetermined interest rate (or, if the agreement allows, a variable interest rate), the amount borrowed, the borrowing costs to be charged, and the timing of the payments. In some cases, companies will secure an interest-only loan, which means that for the life of the loan the organization pays only the interest expense that has accrued and upon maturity repays the original amount that it borrowed and still owes. For individuals a student loan, car loan, or a mortgage can all be types of notes payable.



PROMISSORY NOTE

Loan Agreement Effective Date: *[DD/MM/YYYY]*

Borrower: _____

_____
Address Line 1 (street address)

_____
Address Line 2 (city/state/zip code)

Lender: _____

_____
Address Line 1 (street address)

_____
Address Line 2 (city/state/zip code)

Promise to pay: in U.S. Dollars $ _____ within _____ months from today, in equal continuous monthly payments of $_____each on the _____ day of each month, beginning on _____ and ending on _____.
Borrower promises to pay the Lender the principal listed above plus interest at the APR % rate of: _____.

Value Received for Property as described:

_____.

If this note is not paid in full upon date due, I/we agree to pay all reasonable costs for collection, including all attorney fees.

Figure 5.35 Promissary Note *A personal loan agreement is a formal contract between a lender and borrower. The document lists the conditions of the loan, including the amount borrowed, the borrowing costs to be charged, and the timing of the payments. Promissary Note. By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

If debt instruments are created with a variable interest rate that can fluctuate up or down, depending upon predetermined factors, an inflation measurement must also be included in the documentation. The Federal Funds Rate, for example, is a commonly used tool for potential adjustments in interest rates. To keep our discussion simple, we will use a fixed interest rate in our subsequent calculations.

Another difference between loans and bonds is that the note payable creates an obligation for the borrower to repay the lender on a specified date. To demonstrate the mechanics of a loan, with loans, a note payable is created for the borrower when the loan is initiated. This example assumes the loan will be paid in full by the maturity or due date. Typically, over the life of the loan, payments will be composed of both principal and

interest components. The principal component paid typically reduces the amount that the borrower owes the lender.

Typical long-term loans have other characteristics. For example, most long-term notes are held by one entity, meaning one party provides all of the financing. If a company bought heavy-duty equipment from Caterpillar, it would be common for the seller of the equipment to also have a division that would provide the financing for the transaction. An additional characteristic of a long-term loan is that in many, if not most, situations, the initial creator of the loan will hold it and receive and process payments until it matures.

Returning to the differences between long-term debt and bonds, another difference is that the process for issuing (selling) bonds can be very complicated, especially for companies that are subject to regulation. The bond issue must be approved by the appropriate regulatory agency, and then outside parties such as investment banks sell the bonds to, typically, a large audience of investors. It is not unusual for several months to pass between the time that the company's board of directors approves the bond offering, gets regulatory approval, and then markets and issues the bonds. This additional time is often the reason that the market rate for similar bonds in the outside business environment is higher or lower than the stated interest rate that the company committed to pay when the bond process was first begun. This difference can lead to bonds being issued (sold) at a discount or premium.

Finally, while loans can normally be paid off before they are due, in most cases bonds must be held by an owner until they mature. Because of this last characteristic, a bond, such as a thirty-year bond, might have several owners over its lifetime, while most long-term notes payable will only have one owner.

YOUR TURN

Current versus Long-Term Liabilities

Below is a portion of the 2017 Balance Sheet of **Emerson, Inc.** (shown in millions of dollars).[2] There are several observations we can make from this information.

	2016	2017
Current liabilities		
Short-term borrowings and current maturities of long-term debt	$2,584	862
Long-term debt	4,051	3,794

Figure 5.36 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Notice the company lists separately the Current Liabilities (listed as "Short-term borrowings and current maturities of long-term debt") and Long-term Liabilities (listed as "Long-term debt"). Also, under the "Current liabilities" heading, notice the "Short-term borrowings and current maturities of long-term debt" decreased significantly from 2016 to 2017. In 2016, Emerson held $2.584 billion in short-term borrowings and current maturities of long-term debt. This amount decreased by $1.722 billion in 2017, which is a 67% decrease. During the same timeframe, long-term debt decreased $257 million, going from $4.051 billion to $3.794 billion, which is a 6.3% decrease.

Thinking about the primary purpose of accounting, why do you think accountants separate liabilities into current liabilities and long-term liabilities?

Solution

The primary purpose of accounting is to provide stakeholders

with financial information that is useful for decision making. It is important for stakeholders to understand how much cash will be required to satisfy liabilities within the next year (liquidity) as well as how much will be required to satisfy long-term liabilities (solvency). Stakeholders, especially lenders and owners, are concerned with both liquidity and solvency of the business.

Fundamentals of Bonds

Now let us look at bonds in more depth. A bond is a type of financial instrument that a company issues directly to investors, bypassing banks or other lending institutions, with a promise to pay the investor a specified rate of interest over a specified period of time. When a company borrows money by selling bonds, it is said the company is "issuing" bonds. This means the company exchanges cash for a promise to repay the cash, along with interest, over a set period of time. As you've learned, bonds are formal legal documents that contain specific information related to the bond. In short, it is a legal contract—called a bond certificate (as shown in Figure 5.37) or an indenture—between the issuer (the business borrowing the money) and the lender (the investor lending the money). Bonds are typically issued in relatively small denominations, such as $1,000 so they can be placed in the market and are accessible to a greater market of investors compared to notes. The bond indenture is a contract that lists the features of the bond, such as the amount of money that will be repaid in the future, called the principal (also called face value or maturity value); the maturity date, the day the bond holder will receive the principal amount; and the stated interest rate, which is the

rate of interest the issuer agrees to pay the bondholder throughout the term of the bond.



Figure 5.37 Bond Certificate *If you bought this $1,000 bond on July 1, 2018 and received this bond certificate, it had three important pieces of information: the maturity date (June 30, 2023, 5 years from the issue date when the company will pay back the $1,000; the principal amount ($1,000) which is the amount you will receive in 2023; and the stated annual interest rate (5%) which they will use to determine how much cash to send you each year (0.05 × $1,000 = $50 interest a year for 5 years). Bond Certificate. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

For a typical bond, the issuer commits to paying a stated interest rate either once a year (annually) or twice a year (semiannually). It is important to understand that the stated rate will not go up or down over the life of the bond. This means the borrower will pay the same semiannual or annual interest payment on the same dates for the life of the bond. In other words, when an investor buys a typical bond, the investor will receive, in the future, two major cash flows: periodic interest payments paid either annually or semiannually based on the stated rate of the bond, and the maturity value, which is the

total amount paid to the owner of the bond on the maturity date.

The process of preparing a bond issuance for sale and then selling on the primary market is lengthy, complex, and is usually performed by underwriters—finance professionals who specialize in issuing bonds and other financial instruments. Here, we will only examine transactions concerning issuance, interest payments, and the sale of existing bonds.

There are two other important characteristics of bonds to discuss. First, for most companies, the total value of bonds issued can often range from hundreds of thousands to several million dollars. The primary reason for this is that bonds are typically used to help finance significant long-term projects or activities, such as the purchase of equipment, land, buildings, or another company.

CONCEPTS IN PRACTICE

Apple Inc. Issues Bonds

On May 11, 2017, **Apple Inc.** issued bonds to get cash. **Apple Inc.** submitted a form to the Securities and Exchange Commission (www.sec.gov) to announce their intentions.

Apple Bonds Issued May 11, 2017		
Maturity	**Interest Rate**	**Bond Amount**
2020	Floating rate (variable)	$ 500,000,000.00
2022	Floating rate (variable)	750,000,000.00
2020	1.80% fixed	1,000,000,000.00
2022	2.30% fixed	1,000,000,000.00
2024	2.85% fixed	1,750,000,000.00
2027	3.20% fixed	2,000,000,000.00
		$7,000,000,000.00

Figure 5.38 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

On May 3 of the same year, **Apple Inc.** had issued their 10-Q (quarterly report) that showed the following assets.

APPLE INC. Condensed Consolidated Balance Sheets (Unaudited) (In millions, except number of shares which are reflected in thousands and par value)		
Assets	**April 1, 2017**	**September 24, 2016**
Current assets:		
Cash and cash equivalents	$15,157	$20,484

Figure 5.39 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Apple Inc. reported it had $15 billion dollars in cash and a total of $101 billion in Current Assets. Why did it need to issue bonds to raise $7 billion more?

Analysts suggested that **Apple** would use the cash to pay shareholder dividends. Even though **Apple** reported billions of dollars in cash, most of the cash was in foreign countries because that was where the products had been sold. Tax laws vary by country, but if **Apple** transferred the cash to a US bank account, they would have to pay US income tax on it, at a tax

rate as high as 39%. So, **Apple** was much better off borrowing and paying 3.2% interest, which is tax deductible, than bringing the cash to the US and paying a 39% income tax.

However, it's important to remember that in the United States, Congress can change tax laws at any time, so what was then current tax law when this transaction occurred could change in the future.

The second characteristic of bonds is that bonds are often sold to several investors instead of to one individual investor.

When establishing the stated rate of interest the business will pay on a bond, bond underwriters consider many factors, including the interest rates on government treasury bonds (which are assumed to be risk-free), rates on comparable bond offerings, and firm-specific factors related to the business's risk (including its ability to repay the bond). The more likely the possibility that a company will default on the bond, meaning they either miss an interest payment or do not return the maturity amount to the bond's owner when it matures, the higher the interest rate is on the bond. It is important to understand that the stated rate will not change over the life of any one bond once it is issued. However, the stated rate on future new bonds may change as economic circumstances and the company's financial position changes.

Bonds themselves can have different characteristics. For example, a debenture is an unsecured bond issued based on the good name and reputation of the company. These companies are not pledging other assets to cover the amount in case they fail to pay the debt, or default. The opposite of a debenture is a secured bond, meaning the company is pledging a specific asset as collateral for the bond. With a secured bond, if the company goes under and cannot pay back the bond, the pledged asset would be sold, and the proceeds would be distributed to the bondholders.

There are term bonds, or single-payment bonds, meaning the entire bond will be repaid all at once, rather than in a series of payments. And there are serial bonds, or bonds that will mature over a period of time and will be repaid in a series of payments.

A callable bond (also known as a redeemable bond) is one that can be repurchased or "called" by the issuer of the bond. If a company sells callable bonds with an 8% interest rate and the interest rate the bank is offering subsequently drops to 5%, the company can borrow at that new rate of 5%, call the 8% bonds, and pay them off (even if the purchaser does not want to sell them back). In essence, the institution would be lowering its rate of interest to borrow money from 8% to 5% by calling the bond.

Putable bonds give the bondholder the right to decide whether to sell it back early or keep it until it matures. It is essentially the opposite of a callable bond.

A convertible bond can be converted to common stock in a one-way, one-time conversion. Under what conditions would it make sense to convert? Suppose the face-value interest rate of the bond is 8%. If the company is doing well this year, such that there is an expectation that shareholders will receive a significant dividend and the stock price will rise, the stock might appear to be more valuable than the return on the bond.

Long Description

Picture of a Promissory note, formatted with the following information: Loan Agreement Effective Date: [D D / M M / Y Y Y Y]; Borrower; Lender; Address Line 1 (street address); Address Line 1 (street Address); Address Line 2 (city, state, zip code); Address Line 2 (city, state, zip code); Promise to pay: a certain amount in U.S. Dollars within a set number of months from today, in equal continuous monthly payments of a certain

amount each on a certain day of each month, with beginning and ending dates. Borrower promises to pay the Lender the principal listed above plus interest at a certain APR%. Value Received for Properety is described. If this note is not paid in full upon date due, the borrower agrees to pay all reasonable cost for collection, including all attorney fees. Return

Apple Bonds Issued May 11, 2017. Maturity, Interest Rate, Bond Amount (respectively): 2020, Floating rate (variable), $500,000,000.00; 2022, Floating rate (variable), $750,000,000.00; 2020, 1.80 percent fixed, $1,000,000,000.00; 2022, 2.30 percent fixed, $1,000,000,000.00; 2024, 2.85 percent fixed, $1,750,000,000.00; 2027, 3.20 percent fixed, $2,000,000,000.00; Total Bond Amount $7,000,000,000.00. Return

Footnotes

2 Emerson. 2017 Annual Report. Emerson Electric Company. 2017. https://www.emerson.com/documents/corporate/2017emersonannualreport-en-2883292.pdf

5.3 Bond Entries

Summary of Bond Principles

As we conclude our discussion of bonds, there are two principles that are worth noting. The first principle is there is an inverse relationship between the market rate of interest and the price of the bond. That is, when the market interest rate increases, the price of the bond decreases. This is due to the fact that the stated rate of the bond does not change.[3] As we discussed, when the market interest rate is higher than the stated interest rate of the bond, the bond will sell at a discount to attract investors and to compensate for the interest rate earned between similar bonds. When, on the other hand, the market interest rate is lower than the stated interest rate, the bond will sell at a premium, which also compensates for the interest rate earned between similar bonds. It may be helpful to think of the inverse relationship between the market interest rate and the bond price in terms of analogies such as a teeter-totter in a park or a balance scale, as shown in Figure 5.40.

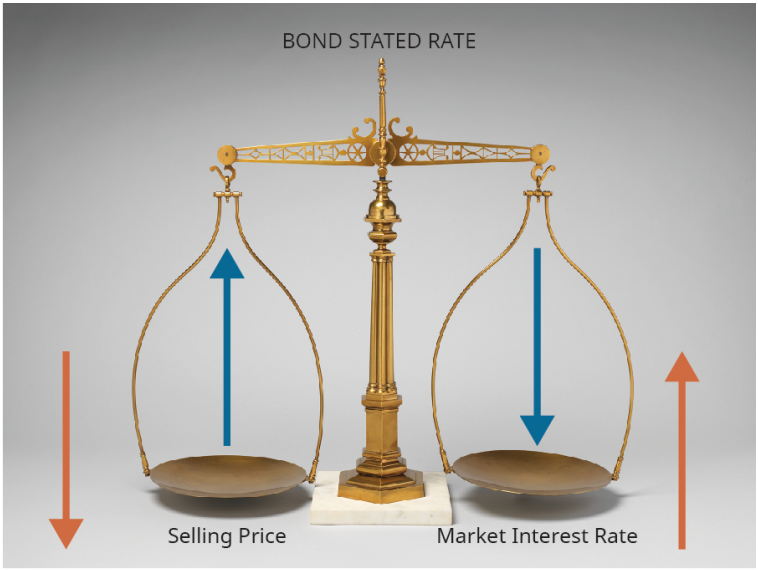


Figure 5.40 Balance Scale *Bond Stated Rate. This illustration demonstrates the relationship between the market interest rate and the selling price of bonds. When the market interest rate goes down, the selling price goes up. The opposite is also true. Balance Scale. By: Mr. and Mrs. Stuart P. Field Source: wikimediacommons CC0 1.0*

In reality, the market interest rate will be above or below the stated interest rate and is rarely equal to the stated rate. The point of this illustration is to help demonstrate the inverse relationship between the market interest rate and the bond selling price.

A second principle relating to bonds involves the relationship of the bond carrying value relative to its face value. By reviewing the amortization tables for bonds sold at a discount and bonds sold at a premium it is clear that the carrying value of bonds will always move toward the face value of the bond. This occurs because interest expense (using the effective-interest method) is calculated using the bond carrying value, which changes each period.

For example, earlier we explored a 5-year, $100,000 bond that sold for $104,460. Return to the amortization table in Figure 5.88 and notice the ending value on the bond is equal to the bond face value of $100,000 (ignoring the rounding difference). The same is true for bonds sold at a discount. In our example, the $100,000 bond sold at $91,800 and the carrying value in year five was $100,000. Understanding that the carrying value of bonds will always move toward the bond face value is one trick students can use to ensure the amortization table and related accounting are correct. If, on the maturity date, the bond carrying value does not equal the bond face value, something is incorrect.

Let's summmarize bond characteristics, When businesses borrow money from banks or other investors, the terms of the arrangement, which include the frequency of the periodic interest payments, the interest rate, and the maturity value, are specified in the bond indentures or loan documents. Recall, too, that when the bonds are issued, the bond indenture only specifies how much the borrower will repay the lender on the maturity date. The amount of money received by the business (borrower) during the issue is called the bond proceeds. The bond proceeds can be impacted by the market interest rate at the time the bonds are sold. Also, because of the lag time between preparing a bond issuance and selling the bonds, the market dynamics may cause the stated interest rate to change. Rarely, the market rate is equal to the stated rate when the bonds are sold, and the bond proceeds will equal the face value of the bonds. More commonly, the market rate is not equal to the stated rate. If the market rate is higher than the stated rate when the bonds are sold, the bonds will be sold at a discount. If the market rate is lower than the stated rate when the bonds are sold, the bonds will be sold at a premium. Figure 5.40 illustrates this rule: that bond prices are inversely related to the market interest rate.

For fun.... here's James Bond 007 treatment of bond entries:



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=285#oembed-1

Footnotes

3 Another reason for the inverse relationship between the market interest rate and bond prices is due to the time value of money.

5.4 Debt v. Equity

Let's consider Maria, who wants to buy a business. The venture is for sale for $1 million, but she only has $200,000. What are her options? In this situation, a business owner can use debt financing by borrowing money or equity financing by selling part of the company, or she can use a combination of both.

Debt financing means borrowing money that will be repaid on a specific date in the future. Many companies have started by incurring debt. To decide whether this is a viable option, the owners need to determine whether they can afford the monthly payments to repay the debt. One positive to this scenario is that interest paid on the debt is tax deductible and can lower the company's tax liability. On the other hand, businesses can struggle to make these payments every month, especially as they are starting out.

With equity financing, a business owner sells part of the business to obtain money to finance business operations. With this type of financing, the original owner gives up some portion of ownership in the company in return for cash. In Maria's case, partners would supplement her $200,000 and would then own a share of the business. Each partner's share is based on their financial or other contributions.

If a business owner forms a corporation, each owner will receive shares of stock. Typically, those making the largest financial investment have the largest say in decisions about business operations. The issuance of dividends should also be considered in this set-up. Paying dividends to shareholders is not tax deductible, but dividend payments are also not required. Additionally, a company does not have to buy back any stock it sells.

Equity Financing

For a corporation, equity financing involves trading or selling shares of stock in the business to raise funds to run the business. For a sole proprietorship, selling part of the business means it is no longer a sole proprietorship: the subsequent transaction could create either a corporation or partnership. The owners would choose which of the two to create. Equity means ownership. However, business owners can be creative in selling interest in their venture. For example, Maria might sell interest in the building housing her candy store and retain all revenues for herself, or she may decide to share interest in the operations (sales revenues) and retain sole ownership of the building.

The main benefit of financing with equity is that the business owner is not required to pay back the invested funds, so revenue can be re-invested in the company's growth. Companies funded this way are also more likely to succeed through their initial years. The Small Business Administration suggests a new business should have access to enough cash to operate for six months without having to borrow. The disadvantages of this funding method are that someone else owns part of the business and, depending on the arrangement, may have ideas that conflict with the original owner's ideas but that cannot be disregarded.

The following characteristics are specific to equity financing:

1. No required payment to owners or shareholders; dividends or other distributions are optional. Stock owners typically invest in stocks for two reasons: the dividends that many stocks pay or the appreciation in the market value of the stocks. For example, a stock holder might buy Walmart stock for $100 per share with the expectation of selling it for much more than $100 per share at some point in the future.

2. Ownership interest held by the original or current owners can be diluted by issuing additional new shares of common stock.
3. Unlike bonds that mature, common stocks do not have a definite life. To convert the stock to cash, some of the shares must be sold.
4. In the past, common stocks were typically sold in even 100-share lots at a given market price per share. However, with Internet brokerages today, investors can buy any particular quantity they want.

Debt Financing

As you have learned, debt is an obligation to pay back an amount of money at some point in the future. Generally, a term of less than one year is considered short-term, and a term of one year or longer is considered long-term. Borrowing money for college or a car with a promise to pay back the amount to the lender generates debt. Formal debt involves a signed written document with a due date, an interest rate, and the amount of the loan. A student loan is an example of a formal debt.

The following characteristics are specific to debt financing:

1. The company is required to make timely interest payments to the holders of the bonds or notes payable.
2. The interest in cash that is to be paid by the company is generally locked in at the agreed-upon rate, and thus the same dollar payments will be made over the life of the bond. Virtually all bonds will have a maturity point. When the bond matures, the maturity value, which was the same as the contract or issuance value, is paid to whoever owns the bond.
3. The interest paid is deductible on the company's income

tax return.

4. Bonds or notes payable do not dilute the company's ownership interest. The holders of the long-term liabilities do not have an ownership interest.
5. Bonds are typically sold in $1,000 increments.

CONCEPTS IN PRACTICE

Short-Term Debt

Businesses sometimes offer lines of credit (short-term debt) to their customers. For example, **Wilson Sporting Goods** offers open credit to tennis clubs around the country. When the club needs more tennis balls, a club manager calls **Wilson** and says, "I'd like to order some tennis balls." The person at **Wilson** says, "What's your account number," and takes the order. **Wilson** does not ask the manager to sign a note but does expect to be paid back. If the club does not pay within 120 days, **Wilson** will not let them order more items until the bill is paid. Ordering on open credit makes transactions simpler for the club and for **Wilson**, since there is not a need to formalize every order. But collecting on the amount might be difficult for **Wilson** if the club delays payment. For this reason, typically customers must fill out applications, or have a history with the vendor to go on open credit.



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view them online here: https://psu.pb.unizin.org/acctg211/?p=280#oembed-1

When deciding whether to raise capital by issuing debt or equity, a corporation needs to consider dilution of ownership, repayment of debt, cash obligations, budgeting impacts, administrative costs, and credit risks.

Dilution of Ownership

The most significant consideration of whether a company should seek funding using debt or equity financing is the effect on the company's financial position. Issuance of debt does not dilute the company's ownership as no additional ownership shares are issued. Issuing debt, or borrowing, creates an increase in cash, an asset, and an increase in a liability, such as notes payable or bonds payable. Because borrowing is independent of an owner's ownership interest in the business, it has no effect on stockholders' equity, and ownership of the corporation remains the same as illustrated in the accounting equation in Figure 5.41.

Assets	=	Liabilities	+	Stockholders' Equity
↑		↑		No effect

Figure 5.41 Debt Financing *Debt financing increases assets and liabilities but has no effect on stockholders' equity. Debt Financing. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

On the other hand, when a corporation issues stock, it is financing with equity. The same increase in cash occurs, but financing causes an increase in a capital stock account in stockholders' equity as illustrated in the accounting equation in Figure 5.42.

Assets	=	Liabilities	+	Stockholders' Equity
↑		No effect		↑

Figure 5.42 Equity Financing *Equity financing increases assets and stockholders' equity but has no effect on liabilities. Equity Financing. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

This increase in stockholders' equity implies that more shareholders will be allowed to vote and will participate in the distribution of profits and assets upon liquidation.

Repayment of Debt

A second concern when choosing between debt and equity financing relates to the repayment to the lender. A lender is a debt holder entitled to repayment of the original principal amount of the loan plus interest. Once the debt is paid, the corporation has no additional obligation to the lender. This allows owners of a corporation to claim a larger portion of the future earnings than would be possible if more stock were sold to investors. In addition, the interest component of the debt is an expense, which reduces the amount of income on which a company's income tax liability is calculated, thereby lowering the corporation's tax liability and the actual cost of the loan to the company.

Cash Obligations

The most obvious difference between debt and equity financing is that with debt, the principal and interest must be repaid, whereas with equity, there is no repayment requirement. The decision to declare dividends is solely up to the board of directors, so if a company has limitations on cash, it can skip or defer the declaration of dividends. When a company obtains capital through debt, it must have sufficient cash available to cover the repayment. This can put pressure on the company to meet debt obligations when cash is needed for other uses.

Budgeting

Except in the case of variable interest loans, loan and interest payments are easy to estimate for the purpose of budgeting cash payments. Loan payments do not tend to be flexible; instead the principal payment is required month after month. Moreover, interest costs incurred with debt are an additional fixed cost to the company, which raises the company's break-even point (total revenue equals total costs) as well as its cash flow demands.

Cost Differences

Issuing debt rather than equity may reduce additional administration costs associated with having additional shareholders. These costs may include the costs for informational mailings, processing and direct-depositing dividend payments, and holding shareholder meetings. Issuing debt also saves the time associated with shareholder

controversies, which can often defer certain management actions until a shareholder vote can be conducted.

Risk Assessment by Creditors

Borrowing commits the borrower to comply with debt covenants that can restrict both the financing options and the opportunities that extend beyond the main business function. This can limit a company's vision or opportunities for change. For example, many debt covenants restrict a corporation's debt-to-equity ratio, which measures the portion of debt used by a company relative to the amount of stockholders' equity, calculated by dividing total debt by total equity.

$$\text{Debt-to-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

Figure 5.43 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

When a company borrows additional funds, its total debt (the numerator) rises. Because there is no change in total equity, the denominator remains the same, causing the debt-to-equity ratio to increase. Because an increase in this ratio usually means that the company will have more difficulty in repaying the debt, lenders and investors consider this an added risk. Accordingly, a business is limited in the amount of debt it can carry. A debt agreement may also restrict the company from borrowing additional funds.

To increase the likelihood of debt repayment, a debt agreement often requires that a company's assets serve as

collateral, or for the company's owners to guarantee repayment. Increased risks to the company from high-interest debt and high amounts of debt, particularly when the economy is unstable, include obstacles to growth and the potential for insolvency resulting from the costs of holding debt. These important considerations should be assessed prior to determining whether a company should choose debt or equity financing.

Owners' Equity: Capital & Shareholders

5.5 Corporate Business Structure

A corporation is a legal business structure involving one or more individuals (owners) who are legally distinct (separate) from the business that is created under state laws. The owners of a corporation are called stockholders (or shareholders) and may or may not be employees of the corporation. Most corporations rely on a combination of debt (liabilities) and equity (stock) to raise capital. Both debt and equity financing have the goal of obtaining funding, often referred to as capital, to be used to acquire other assets needed for operations or expansion. Capital consists of the total cash and other assets owned by a company found on the left side of the accounting equation. The method of financing these assets is evidenced by looking at the right side of the accounting equation, either recorded as liabilities or shareholders' equity.

The Organization of a Corporation

Incorporation is the process of forming a company into a corporate legal entity. The advantages of incorporating are available to a corporation regardless of size, from a corporation with one shareholder to those with hundreds of thousands of shareholders. To issue stock, an entity must first be incorporated in a state.

The process of incorporating requires filing the appropriate paperwork and receiving approval from a governmental entity to operate as a corporation. Each state has separate requirements for creating a corporation, but ultimately, each state grants a corporation the right to conduct business in the

respective state in which the corporation is formed. The steps to incorporate are similar in most states:

1. The founders (incorporators) choose an available business name that complies with the state's corporation rules. A state will not allow a corporation to choose a name that is already in use or that has been in use in recent years. Also, similar names might be disallowed.
2. The founders of a corporation prepare articles of incorporation called a "charter," which defines the basic structure and purpose of the corporation and the amount of capital stock that can be issued or sold.
3. The founders file the articles of incorporation with the Department of State of the state in which the incorporation is desired. Once the articles are filed and any required fees are paid, the government approves the incorporation.
4. The incorporators hold an organizational meeting to elect the board of directors. Board meetings must be documented with formal board minutes (a written record of the items discussed, decisions made, and action plans resulting from the meeting). The board of directors generally meets at least annually. **Microsoft**, for example, has 14 directors on its board.[4] Boards may have more or fewer directors than this, but most boards have a minimum of at least three directors.
5. The board of directors prepares and adopts corporate bylaws. These bylaws lay out the operating rules for the corporation. Templates for drawing up corporate bylaws are usually available from the state to ensure that they conform with that state's requirements.
6. The board of directors agrees upon a par value price for the stock. Par value is a legal concept discussed later in this section. The price that the company receives (the initial market value) will be determined by what the

purchasing public is willing to pay. For example, the company might set the par value at $1 per share, while the investing public on the day of issuance might be willing to pay $30 per share for the stock.

CONCEPTS IN PRACTICE

Deciding Where to Incorporate

With 50 states to choose from, how do corporations decide where to incorporate? Many corporations are formed in either Delaware or Nevada for several reasons. Delaware is especially advantageous for large corporations because it has some of the most flexible business laws in the nation and its court system has a division specifically for handling business cases that operates without juries. Additionally, companies formed in Delaware that do not transact business in the state do not need to pay state corporate income tax. Delaware imposes no personal tax for non-residents, and shareholders can be non-residents. In addition, stock shares owned by non-Delaware residents are not subject to Delaware state taxation.

Because of these advantages, Delaware dominated the share of business incorporation for several decades. In recent years, though, other states are seeking to compete for these businesses by offering similarly attractive benefits of incorporation. Nevada in particular has made headway. It has no state corporate income tax and does not impose any fees on shares or shareholders. After the initial set up fees, Nevada has no personal or franchise tax for corporations or their shareholders. Nevada, like Delaware, does not require shareholders to be state residents. If a corporation chooses to

incorporate in Delaware, Nevada, or any state that is not its home state, it will need to register to do business in its home state. Corporations that transact in states other than their state of incorporation are considered *foreign* and may be subject to fees, local taxes, and annual reporting requirements that can be time consuming and expensive.

Advantages of the Corporate Form

Compared to other forms of organization for businesses, corporations have several advantages. A corporation is a separate legal entity, it provides limited liability for its owner or owners, ownership is transferable, it has a continuing existence, and capital is generally easy to raise.

Separate Legal Entity

A sole proprietorship, a partnership, and a corporation are different types of business entities. However, only a corporation is a legal entity. As a separate legal entity, a corporation can obtain funds by selling shares of stock, it can incur debt, it can become a party to a contract, it can sue other parties, and it can be sued. The owners are separate from the corporation. This separate legal status complies with one of the basic accounting concepts—the accounting entity concept, which indicates that the economic activity of an entity (the corporation) must be kept separate from the personal financial affairs of the owners.

Limited Liability

Many individuals seek to incorporate a business because they want the protection of limited liability. A corporation usually limits the liability of an investor to the amount of his or her investment in the corporation. For example, if a corporation enters into a loan agreement to borrow a sum of money and is unable to repay the loan, the lender cannot recover the amount owed from the shareholders (owners) unless the owners signed a personal guarantee. This is the opposite of partnerships and sole proprietorships. In partnerships and sole proprietorships, the owners can be held responsible for any unpaid financial obligations of the business and can be sued to pay obligations.

Transferable Ownership

Shareholders in a corporation can transfer shares to other parties without affecting the corporation's operations. In effect, the transfer takes place between the parties outside of the corporation. In most corporations, the company generally does not have to give permission for shares to be transferred to another party. No journal entry is recorded in the corporation's accounting records when a shareholder sells his or her stock to another shareholder. However, a memo entry must be made in the corporate stock ownership records so any dividends can be issued to the correct shareholder.

Continuing Existence

From a legal perspective, a corporation is granted existence forever with no termination date. This legal aspect falls in line

with the basic accounting concept of the going concern assumption, which states that absent any evidence to the contrary, a business will continue to operate in the indefinite future. Because ownership of shares in a corporation is transferrable, re-incorporation is not necessary when ownership changes hands. This differs from a partnership, which ends when a partner dies, or from a sole proprietorship, which ends when the owner terminates the business.

Ease of Raising Capital

Because shares of stock can be easily transferred, corporations have a sizeable market of investors from whom to obtain capital. More than 65 million American households[5] hold investments in the securities markets. Compared to sole proprietorships (whose owners must obtain loans or invest their own funds) or to partnerships (which must typically obtain funds from the existing partners or seek other partners to join; although some partnerships are able borrow from outside parties), a corporation will find that capital is relatively easy to raise.

Disadvantages of the Corporate Form

As compared to other organizations for businesses, there are also disadvantages to operating as a corporation. They include the costs of organization, regulation, and taxation.

Costs of Organization

Corporations incur costs associated with organizing the

corporate entity, which include attorney fees, promotion costs, and filing fees paid to the state. These costs are debited to an account called organization costs. Assume that on January 1, Rayco Corporation made a payment for $750 to its attorney to prepare the incorporation documents and paid $450 to the state for filing fees. Rayco also incurred and paid $1,200 to advertise and promote the stock offering. The total organization costs are $2,400 ($750 + $450 + $1,200). The journal entry recorded by Rayco is a $2,400 debit to Organization Costs and a $2,400 credit to Cash.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1	Organization Costs Expense	2,400	
	Cash		2,400
	To record organization costs		

Figure 5.44 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Organization costs are reported as part of the operating expenses on the corporation's income statement.

Regulation

Compared to partnerships and sole proprietorships, corporations are subject to considerably more regulation both by the states in which they are incorporated and the states in which they operate. Each state provides limits to the powers that a corporation may exercise and specifies the rights and liabilities of shareholders. The Securities and Exchange Commission (SEC) is a federal agency that regulates corporations whose shares are listed and traded on security exchanges such as the New York Stock Exchange (NYSE), the National Association of Securities Dealers Automated Quotations Exchange (NASDAQ), and others; it accomplishes

this through required periodic filings and other regulations. States also require the filing of periodic reports and payment of annual fees.

Taxation

As legal entities, typical corporations (C corporations, named after the specific subchapter of the Internal Revenue Service code under which they are taxed), are subject to federal and state income taxes (in those states with corporate taxes) based on the income they earn. Stockholders are also subject to income taxes, both on the dividends they receive from corporations and any gains they realize when they dispose of their stock. The income taxation of both the corporate entity's income and the stockholder's dividend is referred to as double taxation because the income is taxed to the corporation that earned the income and then taxed again to stockholders when they receive a distribution of the corporation's income.

Corporations that are closely held (with fewer than 100 stockholders) can be classified as S corporations, so named because they have elected to be taxed under subchapter S of the Internal Revenue Service code. For the most part, S corporations pay no income taxes because the income of the corporation is divided among and passed through to each of the stockholders, each of whom pays income taxes on his or her share. Both Subchapter S (Sub S) and similar Limited Liability Companies (LLCs) are not taxed at the business entity but instead pass their taxable income to their owners.

Footnotes

- 4 Microsoft Corporation. "Board of Directors."

https://www.microsoft.com/en-us/Investor/corporate-governance/board-of-directors.aspx

- 5 Financial Samurai. “What Percent of Americans Hold Stocks?” February 18, 2019. https://www.financialsamurai.com/what-percent-of-americans-own-stocks/

5.6 How Stocks Work

The Securities and Exchange Commission (SEC) (www.sec.gov) is a government agency that regulates large and small public corporations. Its mission is "to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation."[8] The SEC identifies these as its five primary responsibilities:

- Inform and protect investors
- Facilitate capital information
- Enforce federal securities laws
- Regulate securities markets
- Provide data

Under the Securities Act of 1933,[9] all corporations that make their shares available for sale publicly in the United States are expected to register with the SEC. The SEC's registration requirement covers all securities—not simply shares of stock—including most tradable financial instruments. The Securities Act of 1933, also known as the "truth in securities law," aims to provide investors with the financial data they need to make informed decisions. While some companies are exempt from filing documents with the SEC, those that offer securities for sale in the U.S. and that are not exempt must file a number of forms along with financial statements audited by certified public accountants.

Private versus Public Corporations

Both private and public corporations become incorporated in the same manner through the state governmental agencies

that handles incorporation. The journal entries and financial reporting are the same whether a company is a public or a private corporation. A private corporation is usually owned by a relatively small number of investors. Its shares are not publicly traded, and the ownership of the stock is restricted to only those allowed by the board of directors.

The SEC defines a publicly traded company as a company that "discloses certain business and financial information regularly to the public" and whose "securities trade on public markets."[10] A company can initially operate as private and later decide to "go public," while other companies go public at the point of incorporation. The process of going public refers to a company undertaking an initial public offering (IPO) by issuing shares of its stock to the public for the first time. After its IPO, the corporation becomes subject to public reporting requirements and its shares are frequently listed on a stock exchange.[11]

CONCEPTS IN PRACTICE

Spreading the Risk

The **East India Company** became the world's first publicly traded company as the result of a single factor—risk. During the 1600s, single companies felt it was too risky to sail from the European mainland to the East Indies. These islands held vast resources and trade opportunities, enticing explorers to cross the Atlantic Ocean in search of fortunes. In 1600, several shipping companies joined forces and formed "Governor and Company of Merchants of London trading with the East Indies," which was referred to as the **East India Company**. This arrangement allowed the shipping companies—the

investors—to purchase shares in multiple companies rather than investing in a single voyage. If a single ship out of a fleet was lost at sea, investors could still generate a profit from ships that successfully completely their voyages.[12]

The Secondary Market

A corporation's shares continue to be bought and sold by the public after the initial public offering. Investors interested in purchasing shares of a corporation's stock have several options. One option is to buy stock on the secondary market, an organized market where previously issued stocks and bonds can be traded after they are issued. Many investors purchase through stock exchanges like the New York Stock Exchange or NASDAQ using a brokerage firm. A full-service brokerage firm provides investment advice as well as a variety of financial planning services, whereas a discount brokerage offers a reduced commission and often does not provide investment advice. Most of the stock trading—buying and selling of shares by investors—takes place through brokers, registered members of the stock exchange who buy and sell stock on behalf of others. Online access to trading has broadened the secondary market significantly over the past few decades. Alternatively, stocks can be purchased from investment bankers, who provide advice to companies wishing to issue new stock, purchase the stock from the company issuing the stock, and then resell the securities to the public.[13]

Marketing a Company's Stock

Once a corporation has completed the incorporation process,

it can issue stock. Each share of stock sold entitles the shareholder (the investor) to a percentage of ownership in the company. Private corporations are usually owned by a small number of investors and are not traded on a public exchange. Regardless of whether the corporation is public or private, the steps to finding investors are similar:

1. Have a trusted and reliable management team. These should be experienced professionals who can guide the corporation.
2. Have a financial reporting system in place. Accurate financial reporting is key to providing potential investors with reliable information.
3. Choose an investment banker to provide advice and to assist in raising capital. Investment bankers are individuals who work in a financial institution that is primarily in the business of raising capital for corporations.
4. Write the company's story. This adds personality to the corporation. What is the mission, why it will be successful, and what sets the corporation apart?
5. Approach potential investors. Selecting the right investment bankers will be extremely helpful with this step.

Capital Stock

A company's corporate charter specifies the classes of shares and the number of shares of each class that a company can issue. There are two classes of capital stock—common stock and preferred stock. The two classes of stock enable a company to attract capital from investors with different risk preferences. Both classes of stock can be sold by either public or non-public companies; however, if a company issues only one class, it must be common stock. Companies report both common and

preferred stock in the stockholders' equity section of the balance sheet.

Common Stock

A company's primary class of stock issued is common stock, and each share represents a partial claim to ownership or a share of the company's business. For many companies, this is the only class of stock they have authorized. Common stockholders have four basic rights.

1. Common stockholders have the right to vote on corporate matters, including the selection of corporate directors and other issues requiring the approval of owners. Each share of stock owned by an investor generally grants the investor one vote.
2. Common stockholders have the right to share in corporate net income proportionally through dividends.
3. If the corporation should have to liquidate, common stockholders have the right to share in any distribution of assets after all creditors and any preferred stockholders have been paid.
4. In some jurisdictions, common shareholders have a preemptive right, which allows shareholders the option to maintain their ownership percentage when new shares of stock are issued by the company. For example, suppose a company has 1,000 shares of stock issued and plans to issue 200 more shares. A shareholder who currently owns 50 shares will be given the right to buy a percentage of the new issue equal to his current percentage of ownership. His current percentage of ownership is 5%:

Original ownership percentage=501,000=5%

This shareholder will be given the right to buy 5% of the new issue, or 10 new shares.
Number of new shares to be
purchases=5%×200shares=10shares

Should the shareholder choose not to buy the shares, the company can offer the shares to other investors. The purpose of the preemptive right is to prevent new issuances of stock from reducing the ownership percentage of the current shareholders. If the shareholder in our example is not offered the opportunity to buy 5% of the additional shares (his current ownership percentage) and the new shares are sold to other investors, the shareholder's ownership percentage will drop because the total shares issued will increase.

New ownership percentage=501,200=4.17%

The shareholder would now own only 4.17% of the corporation, compared to the previous 5%.

Preferred Stock

A company's charter may authorize more than one class of stock. Preferred stock has unique rights that are "preferred," or more advantageous, to shareholders than common stock. The classification of preferred stock is often a controversial area in accounting as some researchers believe preferred stock has characteristics closer to that of a stock/bond hybrid security, with characteristics of debt rather than a true equity item. For example, unlike common stockholders, preferred shareholders typically do not have voting rights; in this way, they are similar to bondholders. In addition, preferred shares do not share in the common stock dividend distributions. Instead, the "preferred" classification entitles shareholders to a dividend

that is fixed (assuming sufficient dividends are declared), similar to the fixed interest rate associated with bonds and other debt items. Preferred stock also mimics debt in that preferred shareholders have a priority of dividend payments over common stockholders. While there may be characteristics of both debt and equity, preferred stock is still reported as part of stockholders' equity on the balance sheet.

Not every corporation authorizes and issues preferred stock, and there are some important characteristics that corporations should consider when deciding to issue preferred stock. The price of preferred stock typically has less volatility in the stock market. This makes it easier for companies to more reliably budget the amount of the expected capital contribution since the share price is not expected to fluctuate as freely as for common stock. For the investor, this means there is less chance of large gains or losses on the sale of preferred stock.

The Status of Shares of Stock

The corporate charter specifies the number of authorized shares, which is the maximum number of shares that a corporation can issue to its investors as approved by the state in which the company is incorporated. Once shares are sold to investors, they are considered issued shares. Shares that are issued and are currently held by investors are called outstanding shares because they are "out" in the hands of investors. Occasionally, a company repurchases shares from investors. While these shares are still issued, they are no longer considered to be outstanding. These repurchased shares are called treasury stock.

Assume that Waystar Corporation has 2,000 shares of capital stock authorized in its corporate charter. During May, Waystar issues 1,500 of these shares to investors. These investors are now called stockholders because they "hold" shares of stock.

Because the other 500 authorized shares have not been issued they are considered unissued shares. Now assume that Waystar buys back 100 shares of stock from the investors who own the 1,500 shares. Only 1,400 of the issued shares are considered outstanding, because 100 shares are now held by the company as treasury shares.

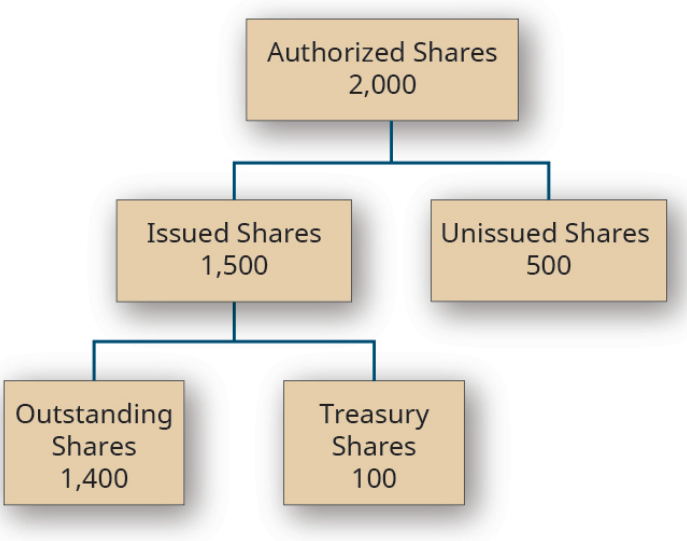


Figure 5.52 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Stock Values

Two of the most important values associated with stock are market value and par value. The market value of stock is the price at which the stock of a public company trades on the stock market. This amount does not appear in the corporation's accounting records, nor in the company's financial statements.

Most corporate charters specify the par value assigned to each share of stock. This value is printed on the stock

certificates and is often referred to as a face value because it is printed on the "face" of the certificate. Incorporators typically set the par value at a very small arbitrary amount because it is used internally for accounting purposes and has no economic significance. Because par value often has some legal significance, it is considered to be legal capital. In some states, par value is the minimum price at which the stock can be sold. If for some reason a share of stock with a par value of one dollar was issued for less than its par value of one dollar known as issuing at a stock discount, the shareholder could be held liable for the difference between the issue price and the par value if liquidation occurs and any creditors remain unpaid.

Under some state laws, corporations are sometimes allowed to issue no-par stock—a stock with no par value assigned. When this occurs, the company's board of directors typically assigns a stated value to each share of stock, which serves as the company's legal capital. Companies generally account for stated value in the accounting records in the same manner as par value. If the company's board fails to assign a stated value to no-par stock, the entire proceeds of the stock sale are treated as legal capital. A portion of the stockholders' equity section of **Frontier Communications Corporation**'s balance sheet as of December 31, 2017 displays the reported preferred and common stock. The par value of the preferred stock is $0.01 per share and $0.25 per share for common stock. The legal capital of the preferred stock is $192.50, while the legal capital of the common stock is $19,883.[14]

FRONTIER COMMUNICATIONS CORPORATION Stockholders' Equity For the Month Ended December 31, 2017	
Preferred Stock, $0.01 par value (50,000 authorized shares, 11.125%, Series A, 19,250 shares issued and outstanding)	$ 192.50
Common Stock, $0.25 par value (175,000 authorized shares, 79,532 issued, and 78,441 and 78,170 outstanding, at December 31, 2017 and 2016, respectively)	19,883.00

Figure 5.53 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Long Description

Frontier Communications Corporation, Stockholders' Equity, For the Month Ended December 31, 2017. Preferred Stock, $0.01 par value (50,000 authorized shares, 11.125%, Series A, 19,250 shares issued and outstanding) $192.50. Common stock, $0.25 par value (175,000 authorized shares, 79,532 issued, and 78,441 and 78,170 outstanding at December 31, 2017 and 2016, respectively) 19,883.00. Return

Footnotes

- 8 U.S. Securities and Exchange Commission. "What We Do." June 10, 2013. https://www.sec.gov/Article/whatwedo.html
- 9 U.S. Securities and Exchange Commission. "Registration under the Securities Act of 1933." https://www.investor.gov/additional-resources/general-resources/glossary/registration-under-securities-act-1933
- 10 U. S. Securities and Exchange Commission. "Public Companies." https://www.investor.gov/introduction-investing/basics/how-market-works/public-companies

- 11 U.S. Securities and Exchange Commission. “Companies, Going Public.” October 14, 2014. https://www.sec.gov/fast-answers/answers-comppublichtm.html
- 12 Johnson Hur. “History of The Stock Market.” BeBusinessed.com. October 2016. https://bebusinessed.com/history/history-of-the-stock-market/
- 13 Dr. Econ. “Why Do Investment Banks Syndicate a New Securities Issue (and Related Questions).” Federal Reserve Bank of San Francisco. December 1999. https://www.frbsf.org/education/publications/doctor-econ/1999/december/investment-bank-securities-retirement-insurance/
- 14 Frontier Communications Corporation. 10-K Filing. February 28, 2018. https://www.sec.gov/Archives/edgar/data/20520/000002052018000007/ftr-20171231x10k.htm#Exhibits_and_Financial_Statement_Schedul

5.7 Owners' Equity

Owners' equity represents the business owners' share of the company. It is often referred to as net worth or net assets in the financial world and as stockholders' equity or shareholders' equity when discussing businesses operations of corporations. From a practical perspective, it represents everything a company owns (the company's assets) minus all the company owes (its liabilities). While "owners' equity" is used for all three types of business organizations (corporations, partnerships, and sole proprietorships), only sole proprietorships name the balance sheet account "owner's equity" as the entire equity of the company belongs to the sole owner. Partnerships often label this section of their balance sheet as "partners' equity." All three forms of business utilize different accounting for the respective equity transactions and use different equity accounts, but they all rely on the same relationship represented by the basic accounting equation (Figure 5.45).



Figure 5.45 Accounting Equation *The relationship among assets, liabilities, and equity is represented in the accounting equation. Accounting Equation. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Three Forms of Business Ownership

Businesses operate in one of three forms—sole proprietorships, partnerships, or corporations. Sole proprietorships utilize a single account in owners' equity in which the owner's investments and net income of the company are accumulated and distributions to the owner are

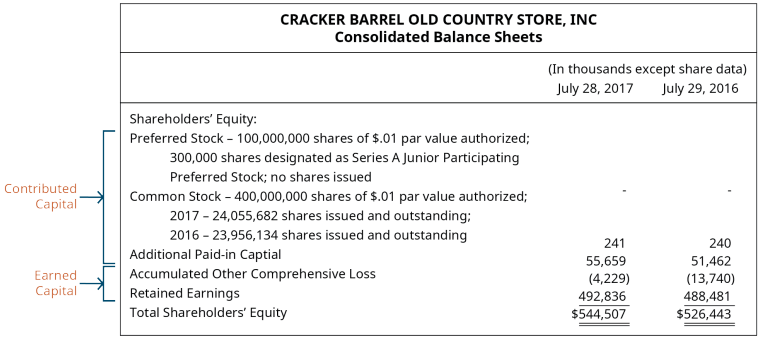
withdrawn. Partnerships utilize a separate capital account for each partner, with each capital account holding the respective partner's investments and the partner's respective share of net income, with reductions for the distributions to the respective partners. Corporations differ from sole proprietorships and partnerships in that their operations are more complex, often due to size. Unlike these other entity forms, owners of a corporation usually change continuously.

The stockholders' equity section of the balance sheet for corporations contains two primary categories of accounts. The first is paid-in capital, or contributed capital—consisting of amounts paid in by owners. The second category is earned capital, consisting of amounts earned by the corporation as part of business operations. On the balance sheet, retained earnings is a key component of the earned capital section, while the stock accounts such as common stock, preferred stock, and additional paid-in capital are the primary components of the contributed capital section.

CONCEPTS IN PRACTICE

Contributed Capital and Earned Capital

The stockholders' equity section of **Cracker Barrel Old Country Store, Inc.**'s consolidated balance sheet as of July 28, 2017, and July 29, 2016, shows the company's contributed capital and the earned capital accounts.[6]



CRACKER BARREL OLD COUNTRY STORE, INC
Consolidated Balance Sheets

	(In thousands except share data) July 28, 2017	July 29, 2016
Shareholders' Equity:		
Preferred Stock – 100,000,000 shares of $.01 par value authorized; 300,000 shares designated as Series A Junior Participating Preferred Stock; no shares issued	-	-
Common Stock – 400,000,000 shares of $.01 par value authorized; 2017 – 24,055,682 shares issued and outstanding; 2016 – 23,956,134 shares issued and outstanding	241	240
Additional Paid-in Captial	55,659	51,462
Accumulated Other Comprehensive Loss	(4,229)	(13,740)
Retained Earnings	492,836	488,481
Total Shareholders' Equity	$544,507	$526,443

Figure 5.46 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Characteristics and Functions of the Retained Earnings Account

Retained earnings is the primary component of a company's earned capital. It generally consists of the cumulative net income minus any cumulative losses less dividends declared. A basic statement of retained earnings is referred to as an analysis of retained earnings because it shows the changes in the retained earnings account during the period. A company preparing a full set of financial statements may choose between preparing a statement of retained earnings, if the activity in its stock accounts is negligible, or a statement of stockholders' equity, for corporations with activity in their stock accounts. A statement of retained earnings for Clay Corporation for its second year of operations (Figure 5.47)

shows the company generated more net income than the amount of dividends it declared.

CLAY CORPORATION Statement of Retained Earnings For the Year Ended December 31, 2020		
Retained Earnings, January 1, 2020		$ 24,000
Net Income		33,000
		57,000
Cash Dividends declared	$(12,500)	
Stock Dividends declared	(6,500)	(19,000)
Retained Earnings, December 31, 2020		$ 38,000

Figure 5.47 Statement of Retained Earnings for Clay Corporation *By: Rice University Source: OpenStax CC BY-NC-SA 4.0 Long Description*

When the retained earnings balance drops below zero, this negative or debit balance is referred to as a deficit in retained earnings.

Statement of Stockholders' Equity

The statement of retained earnings is a subsection of the statement of stockholders' equity. While the retained earnings statement shows the changes between the beginning and ending balances of the retained earnings account during the period, the statement of stockholders' equity provides the changes between the beginning and ending balances of each of the stockholders' equity accounts, including retained earnings. The format typically displays a separate column for each stockholders' equity account, as shown for Clay Corporation in Figure 5.49. The key events that occurred during the year—including net income, stock issuances, and dividends—are listed vertically. The stockholders' equity section of the company's balance sheet displays only the ending

balances of the accounts and does not provide the activity or changes during the period.

CLAY CORPORATION Statement of Stockholders' Equity For the Year Ended December 31, 2020					
	Common Stock, $1 par	**Additional Paid-in Capital**	**Treasury Stock, at cost $3**	**Retained Earnings**	**Totals**
Beginning balance, January 1, 2020	$5,000	$64,000	$(1,200)	$ 24,000	$ 91,800
Net Income				33,000	33,000
Common Stock issued, 800 shares	800	3,600			4,400
Cash Dividends declared				(12,500)	(12,500)
Stock Dividends declared				(6,500)	(6,500)
Treasury Stock acquired, 600 shares			(4,200)		(4,200)
Ending balance, December 31, 2020	$5,800	$67,600	$(5,400)	$ 38,000	$106,000

Figure 5.49 Statement of Stockholders' Equity for Clay Corporation
By: Rice University Source: OpenStax CC BY-NC-SA 4.0 Long Description

Nearly all public companies report a statement of stockholders' equity rather than a statement of retained earnings because GAAP requires disclosure of the changes in stockholders' equity accounts during each accounting period. It is significantly easier to see the changes in the accounts on a statement of stockholders' equity rather than as a paragraph note to the financial statements.

Long Descriptions

Cracker Barrel Old Country Store, Inc, Consolidated Balance Sheets. (In thousands except share data) July 28, 2017 and July 29, 2016, respectively: Shareholders' Equity: Preferred Stock – 100,000,000 shares of $.01 par value authorized; 300,000 shares designated as Series A Junior Participating Preferred Stock; no shares issued. Common stock – 400,000,000 shares of $.01 par value authorized; 2017 – 24,055,682 shares issued and

outstanding; 2016 – 23,956,134 shares issued and outstanding 241, 240. Additional paid-in capital 55,659, 51,462. Accumulated other comprehensive loss (4,220), (13,740). Retained earnings 492,836, 488,481. Total shareholders' equity 544,507, 526,443. A bracket around the Preferred stock, Common stock, and Additional paid-in capital indicates that they make up the contributed capital. A bracket around the Accumulated other comprehensive loss and the Retained earnings indicates that they make up the earned capital. Return

Clay Corporation, Statement of Stockholders' Equity, For the Year Ended December 31, 2020. Common Stock, $1 par; Additional Paid-in Capital; Treasury Stock, at cost $3; Retained Earnings; Totals (respectively): Beginning balance, January 1, 2020: $5,000, 64,000, (1,200), 24,000, 91,800. Net Income: -, -, -, 33,000, 33,000. Common stock issued, 800 shares: 800, 3,600, -, -, 4,400. Cash dividends declared: -, -, -, (12,500), (12,500). Stock dividends declared: -, -, -, (6,500), (6,500). Treasury stock acquired, 600 shares: -, -, (4,200), -, (4,200). Ending balance, December 31, 2020: $5,800, 67,600, (5,400), 38,000, 106,000. Return

Clay Corporation, Statement of Retained Earnings, For the Year Ended December 31, 2020 Retained earnings, January 1, 2020 $24,000. Prior Period adjustment, net of income taxes (700). Adjusted Retained earnings, January 1, 2020 24,700. Net Income 33,000. Less Cash dividend declared of (12,500) and Stock dividend declared of (6,500), totaling 19,000. Retained Earnings, December 31, 2020 $38,700. Return

Footnotes

- 6 Cracker Barrel. *Cracker Barrel Old Country Store Annual Report 2017*. September 22, 2017. http://investor.crackerbarrel.com/static-files/c05f90b8-1214-4f50-8508-d9a70301f51f

5.8 Typical Stock Transactions

Chad and Rick have successfully incorporated La Cantina and are ready to issue common stock to themselves and the newly recruited investors. The proceeds will be used to open new locations. The corporate charter of the corporation indicates that the par value of its common stock is $1.50 per share. When stock is sold to investors, it is very rarely sold at par value. Most often, shares are issued at a value in excess of par. This is referred to as issuing stock at a premium. Stock with no par value that has been assigned a stated value is treated very similarly to stock with a par value.

Stock can be issued in exchange for cash, property, or services provided to the corporation. For example, an investor could give a delivery truck in exchange for a company's stock. Another investor could provide legal fees in exchange for stock. The general rule is to recognize the assets received in exchange for stock at the asset's fair market value.

Typical Common Stock Transactions

The company plans to issue most of the shares in exchange for cash, and other shares in exchange for kitchen equipment provided to the corporation by one of the new investors. Two common accounts in the equity section of the balance sheet are used when issuing stock—Common Stock and Additional Paid-in Capital from Common Stock. Common Stock consists of the par value of all shares of common stock issued. Additional paid-in capital from common stock consists of the excess of the proceeds received from the issuance of the

stock over the stock's par value. When a company has more than one class of stock, it usually keeps a separate additional paid-in capital account for each class.

Issuing Common Stock with a Par Value in Exchange for Cash

When a company issues new stock for cash, assets increase with a debit, and equity accounts increase with a credit. To illustrate, assume that La Cantina issues 8,000 shares of common stock to investors on January 1 for cash, with the investors paying cash of $21.50 per share. The total cash to be received is $172,000.

The transaction causes Cash to increase (debit) for the total cash received. The Common Stock account increases (credit) with a credit for the par value of the 8,000 shares issued: 8,000 × $1.50, or $12,000. The excess received over the par value is reported in the Additional Paid-in Capital from Common Stock account. Since the shares were issued for $21.50 per share, the excess over par value per share of $20 ($21.50 − $1.50) is multiplied by the number of shares issued to arrive at the Additional Paid-in Capital from Common Stock credit.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1	Cash	172,000	
	Common Stock		12,000
	Additional Paid-in Capital from Common Stock		160,000
	To record the issuance of $1.50 par value common stock for cash		

Figure 5.54 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Issuing Common Stock with a Par Value in Exchange for Property or Services

When a company issues stock for property or services, the company increases the respective asset account with a debit and the respective equity accounts with credits. The asset received in the exchange—such as land, equipment, inventory, or any services provided to the corporation such as legal or accounting services—is recorded at the fair market value of the stock or the asset or services received, whichever is more clearly determinable.

To illustrate, assume that La Cantina issues 2,000 shares of authorized common stock in exchange for legal services provided by an attorney. The legal services have a value of $8,000 based on the amount the attorney would charge. Because La Cantina's stock is not actively traded, the asset will be valued at the more easily determinable market value of the legal services. La Cantina must recognize the market value of the legal services as an increase (debit) of $8,000 to its Legal Services Expense account. Similar to recording the stock issued for cash, the Common Stock account is increased by the par value of the issued stock, $1.50 × 2,000 shares, or $3,000. The excess of the value of the legal services over the par value of the stock appears as an increase (credit) to the Additional Paid-in Capital from Common Stock account:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1	Legal Services Expense	8,000	
	Common Stock		3,000
	Additional Paid-in Capital from Common Stock		5,000
	To record the issuance of $1.50 par value common stock in exchange for legal services provided		

Figure 5.55 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Just after the issuance of both investments, the stockholders' equity account, Common Stock, reflects the total par value of the issued stock; in this case, $3,000 + $12,000, or a total of $15,000. The amounts received in excess of the par value are accumulated in the Additional Paid-in Capital from Common Stock account in the amount of $5,000 + $160,000, or $165,000. A portion of the equity section of the balance sheet just after the two stock issuances by La Cantina will reflect the Common Stock account stock issuances as shown in Figure 5.56.

LA CANTINA Partial Stockholders' Equity Section of the Balance Sheet For the Month Ended December 31, 2020	
Stockholders' Equity	
Common Stock, $1.50 par value, 20,000 shares authorized, 10,000 issued and outstanding	$ 15,000
Additional Paid-in Capital from Common Stock	165,000

Figure 5.56 Partial Stockholder's Equity for La Cantina *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Issuing No-Par Common Stock with a Stated Value

Not all stock has a par value specified in the company's charter. In most cases, no-par stock is assigned a stated value by the board of directors, which then becomes the legal capital value. Stock with a stated value is treated as if the stated value is a par value. Assume that La Cantina's 8,000 shares of common stock issued on June 1 for $21.50 were issued at a stated value of $1.50 rather than at a par value. The total cash to be received remains $172,000 (8,000 shares × $21.50), which is recorded as an increase (debit) to Cash. The Common Stock account increases with a credit for the stated value of the 8,000 shares issued: 8,000 × $1.50, or $12,000. The excess received over the

stated value is reported in the Additional Paid-in Capital from Common Stock account at $160,000, based on the issue price of $21.50 per share less the stated value of $1.50, or $20, times the 8,000 shares issued:

The transaction looks identical except for the explanation.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1	Cash	172,000	
	Common Stock		12,000
	Additional Paid-in Capital from Common Stock		160,000
	To record the issuance of $1.50 stated value common stock for cash		

Figure 5.57 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

If the 8,000 shares of La Cantina's common stock had been no-par, and no stated value had been assigned, the $172,000 would be debited to Cash, with a corresponding increase in the Common Stock account as a credit of $172,000. No entry would be made to Additional Paid-in Capital account as it is reserved for stock issue amounts above par or stated value. The entry would appear as:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1	Cash	172,000	
	Common Stock		172,000
	To record the issuance of no-par common stock for cash		

Figure 5.58 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

One or more interactive elements has been excluded from this version of the text. You can

view them online here: https://psu.pb.unizin.org/acctg211/?p=292#oembed-1

Issuing Preferred Stock

A few months later, Chad and Rick need additional capital to develop a website to add an online presence and decide to issue all 1,000 of the company's authorized preferred shares. The 5%, $8 par value, preferred shares are sold at $45 each. The Cash account increases with a debit for $45 times 1,000 shares, or $45,000. The Preferred Stock account increases for the par value of the preferred stock, $8 times 1,000 shares, or $8,000. The excess of the issue price of $45 per share over the $8 par value, times the 1,000 shares, is credited as an increase to Additional Paid-in Capital from Preferred Stock, resulting in a credit of $37,000.

The journal entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 1	Cash	45,000	
	Preferred Stock		8,000
	Additional Paid-in Capital from Preferred Stock		37,000
	To record the issuance of $8 par value preferred stock for cash		

Figure 5.59 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Figure 5.60 shows what the equity section of the balance sheet will reflect after the preferred stock is issued.

LA CANTINA Partial Stockholders' Equity Section of the Balance Sheet For the Month Ended December 31, 2020	
Stockholders' Equity	
5% Preferred Stock. $8 par value, 1,000 shares authorized, 1,000 shares issued and outstanding	$ 8,000
Additional Paid-in Capital from Preferred Stock	37,000
Common Stock, $1.50 par value, 20,000 shares authorized, 10,000 shares issued and outstanding	15,000
Additional Paid-in Capital from Common Stock	165,000
Retained Earnings	xx

Figure 5.60 Partial Stockholders' Equity for La Cantina *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Notice that the corporation presents preferred stock before common stock in the Stockholders' Equity section of the balance sheet because preferred stock has preference over common stock in the case of liquidation. GAAP requires that each class of stock displayed in this section of the balance sheet includes several items that must be disclosed along with the respective account names. The required items to be disclosed are:

- Par or stated value
- Number of shares authorized
- Number of shares issued
- Number of shares outstanding
- If preferred stock, the dividend rate

One or more interactive elements has been excluded from this version of the text. You can

view them online here: https://psu.pb.unizin.org/acctg211/?p=292#oembed-2

Long Description

La Cantina, Partial Stockholders' Equity Section of the Balance Sheet, For the Month Ended December 31, 2020. Stockholders' Equity: 5% percent Preferred stock, $8 par value, 1,000 shares authorized, 1,000 shares issued and outstanding $8,000. Additional paid-in capital from preferred stock 37,000. Common Stock, $1.50 par value, 20,000 shares authorized, 10,000 issued and outstanding $15,000. Additional Paid-in capital from common 165,000. Retained Earnings xx. Return

5.9 Treasury Stock

Sometimes a corporation decides to purchase its own stock in the market. These shares are referred to as treasury stock. A company might purchase its own outstanding stock for a number of possible reasons. It can be a strategic maneuver to prevent another company from acquiring a majority interest or preventing a hostile takeover. A purchase can also create demand for the stock, which in turn raises the market price of the stock. Sometimes companies buy back shares to be used for employee stock options or profit-sharing plans.

Acquiring Treasury Stock

When a company purchases treasury stock, it is reflected on the balance sheet in a contra equity account. As a contra equity account, Treasury Stock has a debit balance, rather than the normal credit balances of other equity accounts. The total cost of treasury stock reduces total equity. In substance, treasury stock implies that a company owns shares of itself. However, owning a portion of one's self is not possible. Treasury shares do not carry the basic common shareholder rights because they are not outstanding. Dividends are not paid on treasury shares, they provide no voting rights, and they do not receive a share of assets upon liquidation of the company. There are two methods possible to account for treasury stock—the cost method, which is discussed here, and the par value method, which is a more advanced accounting topic. The cost method is so named because the amount in the Treasury Stock account at any point in time represents the number of shares held in treasury times the original cost paid to acquire each treasury share.

Assume Duratech's net income for the first year was $3,100,000, and that the company has 12,500 shares of common stock issued. During May, the company's board of directors authorizes the repurchase of 800 shares of the company's own common stock as treasury stock. Each share of the company's common stock is selling for $25 on the open market on May 1, the date that Duratech purchases the stock. Duratech will pay the market price of the stock at $25 per share times the 800 shares it purchased, for a total cost of $20,000. The following journal entry is recorded for the purchase of the treasury stock under the cost method.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
May 1	Treasury Stock	20,000	
	Cash		20,000
	To record the purchase of treasury stock for cash		

Figure 5.61 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Even though the company is purchasing stock, there is no asset recognized for the purchase. An entity cannot own part of itself, so no asset is acquired. Immediately after the purchase, the equity section of the balance sheet (Figure 5.62) will show the total cost of the treasury shares as a deduction from total stockholders' equity.

DURATECH Partial Stockholders' Equity Section of the Balance Sheet For the Month Ended December 31, 2020	
Stockholders' Equity	
5% Preferred Stock. $8 par value, 1,000 shares authorized, 1,000 shares issued and outstanding	$ 8,000
Additional Paid-in Capital from Preferred Stock	37,000
Common Stock, $1.50 par value, 20,000 shares authorized, 10,000 shares issued, 9,200 shares outstanding	15,000
Additional Paid-in Capital from Common Stock	70,000
Retained Earnings	31,000
	161,000
Treasury Stock (800 shares) at cost	(20,000)
Total Stockholders' Equity	$141,000

Figure 5.62 Partial Stockholders' Equity Section of the Balance Sheet for Duratech. *After the purchase of treasury stock, the stockholders' equity section of the balance sheet is shown as a deduction from total stockholders' equity. Partial Stockholders' Equity Section of the Balance Sheet for Duratech. By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Notice on the partial balance sheet that the number of common shares outstanding changes when treasury stock transactions occur. Initially, the company had 10,000 common shares issued and outstanding. The 800 repurchased shares are no longer outstanding, reducing the total outstanding to 9,200 shares.

CONCEPTS IN PRACTICE

Reporting Treasury Stock for Nestlé Holdings Group

Nestlé Holdings Group sells a number of major brands of food and beverages including **Gerber**, **Häagen-Dazs**, **Purina**, and **Lean Cuisine**. The company's statement of stockholders' equity shows that it began with 990 million Swiss francs (CHF) in treasury stock at the beginning of 2016. In 2017, it acquired additional shares at a cost of 3,547 million CHF, raising its total treasury stock to 4,537 million CHF at the end of 2017, primarily due to a share buy-back program.[15]

NESTLE HOLDING GROUP
Consolidated Statement of Changes in Equity
For the Year Ended December 31, 2017

Millions (CHF)	Share Capital	Treasury Shares	Paid-in Capital	Other	Total Equity
Equity as of December 31, 2016	311	(990)	82,870	(16,210)	65,981
Profit for the year			7,538		7,538
Other comprehensive income			252		252
Dividends			(7,468)		(7,468)
Treasury Shares		(3,719)	113		(3,606)
Other		172	869	(961)	80
Equity at December 31, 2017	311	(4,537)	84,174	(17,171)	62,777

Figure 5.63 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Descrption*

Reissuing Treasury Stock above Cost

Management typically does not hold treasury stock forever.

The company can resell the treasury stock at cost, above cost, below cost, or retire it. If La Cantina reissues 100 of its treasury shares at cost ($25 per share) on July 3, a reversal of the original purchase for the 100 shares is recorded. This has the effect of increasing an asset, Cash, with a debit, and decreasing the Treasury Stock account with a credit. The original cost paid for each treasury share, $25, is multiplied by the 100 shares to be resold, or $2,500. The journal entry to record this sale of the treasury shares at cost is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 3	Cash	2,500	
	Treasury Stock		2,500
	To record the sale of 100 shares of treasury stock at cost		

Figure 5.64 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

If the treasury stock is resold at a price higher than its original purchase price, the company debits the Cash account for the amount of cash proceeds, reduces the Treasury Stock account with a credit for the cost of the treasury shares being sold, and credits the Paid-in Capital from Treasury Stock account for the difference. Even though the difference—the selling price less the cost—looks like a gain, it is treated as additional capital because gains and losses only result from the disposition of economic resources (assets). Treasury Stock is not an asset. Assume that on August 1, La Cantina sells another 100 shares of its treasury stock, but this time the selling price is $28 per share. The Cash Account is increased by the selling price, $28 per share times the number of shares resold, 100, for a total debit to Cash of $2,800. The Treasury Stock account decreases by the cost of the 100 shares sold, 100 × $25 per share, for a total credit of $2,500, just as it did in the sale at cost. The difference is recorded as a credit of $300 to Additional Paid-in Capital from Treasury Stock.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Aug. 1	Cash	2,800	
	Treasury Stock		2,500
	Additional Paid-in Capital from Treasury Stock		300
	To record the sale of 100 shares of treasury stock above cost		

Figure 5.65 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Reissuing Treasury Stock Below Cost

If the treasury stock is reissued at a price below cost, the account used for the difference between the cash received from the resale and the original cost of the treasury stock depends on the balance in the Paid-in Capital from Treasury Stock account. Any balance that exists in this account will be a credit. The transaction will require a debit to the Paid-in Capital from Treasury Stock account to the extent of the balance. If the transaction requires a debit greater than the balance in the Paid-in Capital account, any additional difference between the cost of the treasury stock and its selling price is recorded as a reduction of the Retained Earnings account as a debit. If there is no balance in the Additional Paid-in Capital from Treasury Stock account, the entire debit will reduce retained earnings.

Assume that on October 9, La Cantina sells another 100 shares of its treasury stock, but this time at $23 per share. Cash is increased for the selling price, $23 per share times the number of shares resold, 100, for a total debit to Cash of $2,300. The Treasury Stock account decreases by the cost of the 100 shares sold, 100 × $25 per share, for a total credit of $2,500. The difference is recorded as a debit of $200 to the Additional Paid-in Capital from Treasury Stock account. Notice that the balance in this account from the August 1 transaction was $300, which was sufficient to offset the $200 debit. The transaction is recorded as:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 9	Cash Additional Paid-in Capital from Treasury Stock Treasury Stock *To record the sale of 100 shares of treasury stock below cost*	2,300 200	 2,500

Figure 5.66 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Treasury stock transactions have no effect on the number of shares authorized or issued. Because shares held in treasury are not outstanding, each treasury stock transaction will impact the number of shares outstanding. A corporation may also purchase its own stock and retire it. Retired stock reduces the number of shares issued. When stock is repurchased for retirement, the stock must be removed from the accounts so that it is not reported on the balance sheet. The balance sheet will appear as if the stock was never issued in the first place.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=295#oembed-1

YOUR TURN

Understanding Stockholders' Equity

Wilson Enterprises reports the following stockholders' equity:

WILSON ENTERPRISES, INC. Stockholders' Equity Section of the Balance Sheet For the Month Ended December 31, 2020	
Stockholders' Equity	
Preferred Stock, $100 par value, 10,000 shares authorized, 10,000 shares issued and outstanding	$ 1,000,000
Common Stock, $1 par value, 2,000,000 shares authorized, 1,200,000 shares issued, and 1,180,000 shares outstanding	1,200,000
Additional Paid-in Capital	16,800,000
Retained Earnings	3,670,000
	22,670,000
Treasury Stock (20,000 shares)	(240,000)
Total Stockholders' Equity	$22,430,000

Figure 5.67 Wilson Enterprises, Inc. *Stockholders' Equity Section of the Balance Sheet, For the Month Ended December 31, 2020. Wilson Enterprises Inc. By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Based on the partial balance sheet presented, answer the following questions:

A. At what price was each share of treasury stock purchased?
B. What is reflected in the additional paid-in capital account?
C. Why is there a difference between the common stock shares issued and the shares outstanding?

Solution

A. $240,000 ÷ 20,000 = $12 per share. B. The difference between the market price and the par value when the stock was issued. C. Treasury stock.

Long Descriptions

La Cantina, Partial Stockholders' Equity Section of the Balance Sheet, For the Month Ended December 31, 2020. Stockholders' Equity: 5 percent Preferred stock, $8 par value, 1,000 shares

authorized, 1,000 shares issued and outstanding $8,000. Additional paid-in capital from preferred stock 37,000. Common Stock, $1.50 par value, 20,000 shares authorized, 10,000 issued and outstanding $15,000. Additional Paid-in capital from common 70,000. Retained Earnings 31,000. Total 161,000. Treasury stock (800 shares) at cost 20,000. Total stockholders' equity $141,000. Return

Nestle Holding Group, Consolidated Statement of Changes in Equity, For the Year Ended December 31, 2017. Millions (CHF), Share Capital, Treasury Shares, Paid-in Capital, Other, Total Equity (respectively): Equity as of December 31, 2016, 311, (990), 82,870, (16,210) 65,981. Profit for the year, -, -, 7,538, -, 7,538. Other comprehensive income, -, -, 252, -, 252. Dividends, -, -, (7,468), -, (7,468). Treasury shares, -, (3,719), 113, -, (3,606). Other, -, 172, 869, (961), 80. Equity at December 31, 2017, 311, (4,537), 84,174, (17,171), 62,777. Return

Preferred stock, $100 par value, 10,000 shares authorized, 10,000 shares issued and outstanding $1,000,000. Common Stock, $1 par value, 2,000,000 shares authorized, 1,200,000 issued and 1,180,000 outstanding $1,200,000. Additional Paid-in capital 16,800,000. Retained Earnings 3,670,000. Total 22,670,000. Treasury stock (20,000 shares) (240,000). Total Stockholders' Equity $22,430,000. Return

Footnotes

- 15 Nestlé. "Annual Report 2017." 2017. https://www.nestle.com/investors/annual-report

5.10 Dividends

Do you remember playing the board game Monopoly when you were younger? If you landed on the Chance space, you picked a card. The Chance card may have paid a $50 dividend. At the time, you probably were just excited for the additional funds.

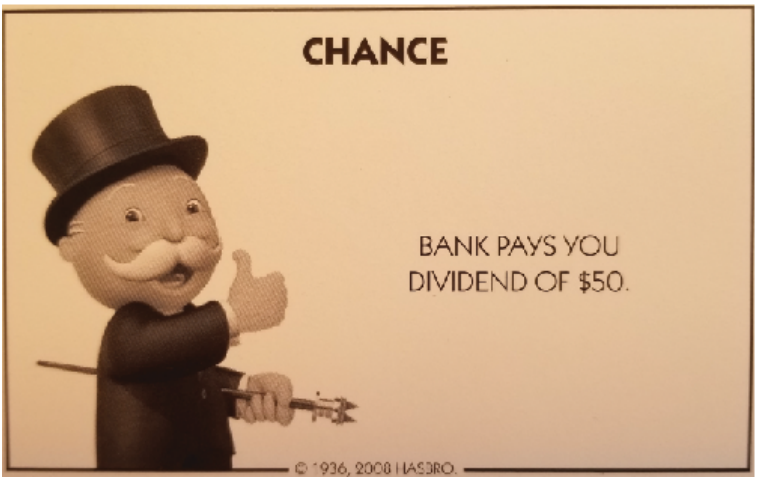


Figure 5.68 Monopoly Chance Card *A Chance card from a Monopoly game indicates that the bank pays you a dividend of $50. Monopoly Chance Card. By: Kerry Ceszyk Source: Flickr CC BY 4.0*

For corporations, there are several reasons to consider sharing some of their earnings with investors in the form of dividends. Many investors view a dividend payment as a sign of a company's financial health and are more likely to purchase its stock. In addition, corporations use dividends as a marketing tool to remind investors that their stock is a profit generator.

This section explains the three types of dividends—cash dividends, property dividends, and stock dividends—along

with stock splits, showing the journal entries involved and the reason why companies declare and pay dividends.

The Nature and Purposes of Dividends

Stock investors are typically driven by two factors—a desire to earn income in the form of dividends and a desire to benefit from the growth in the value of their investment. Members of a corporation's board of directors understand the need to provide investors with a periodic return, and as a result, often declare dividends up to four times per year. However, companies can declare dividends whenever they want and are not limited in the number of annual declarations. Dividends are a distribution of a corporation's earnings. They are not considered expenses, and they are not reported on the income statement. They are a distribution of the net income of a company and are not a cost of business operations.

CONCEPTS IN PRACTICE

So Many Dividends

The declaration and payment of dividends varies among companies. In December 2017 alone, 4,506 U.S. companies declared either cash, stock, or property dividends—the largest number of declarations since 2004.[16] It is likely that these companies waited to declare dividends until after financial statements were prepared, so that the board and other executives involved in the process were able to provide estimates of the 2017 earnings.

Some companies choose not to pay dividends and instead reinvest all of their earnings back into the company. One common scenario for situation occurs when a company experiencing rapid growth. The company may want to invest all their retained earnings to support and continue that growth. Another scenario is a mature business that believes retaining its earnings is more likely to result in an increased market value and stock price. In other instances, a business may want to use its earnings to purchase new assets or branch out into new areas. Most companies attempt dividend smoothing, the practice of paying dividends that are relatively equal period after period, even when earnings fluctuate. In exceptional circumstances, some corporations pay a special dividend, which is a one-time extra distribution of corporate earnings. A special dividend usually stems from a period of extraordinary earnings or a special transaction, such as the sale of a division. Some companies, such as **Costco Wholesale Corporation**, pay recurring dividends and periodically offer a special dividend. While **Costco**'s regular quarterly dividend is $0.57 per share, the company issued a $7.00 per share cash dividend in 2017.[17] Companies that have both common and preferred stock must consider the characteristics of each class of stock.

Note that dividends are distributed or paid only to shares of stock that are outstanding. Treasury shares are not outstanding, so no dividends are declared or distributed for these shares. Regardless of the type of dividend, the declaration always causes a decrease in the retained earnings account.

Dividend Dates

A company's board of directors has the power to formally vote

to declare dividends. The date of declaration is the date on which the dividends become a legal liability, the date on which the board of directors votes to distribute the dividends. Cash and property dividends become liabilities on the declaration date because they represent a formal obligation to distribute economic resources (assets) to stockholders. On the other hand, stock dividends distribute additional shares of stock, and because stock is part of equity and not an asset, stock dividends do not become liabilities when declared.

At the time dividends are declared, the board establishes a date of record and a date of payment. The date of record establishes who is entitled to receive a dividend; stockholders who own stock on the date of record are entitled to receive a dividend even if they sell it prior to the date of payment. Investors who purchase shares after the date of record but before the payment date are not entitled to receive dividends since they did not own the stock on the date of record. These shares are said to be sold ex dividend. The date of payment is the date that payment is issued to the investor for the amount of the dividend declared.

Cash Dividends

Cash dividends are corporate earnings that companies pass along to their shareholders. To pay a cash dividend, the corporation must meet two criteria. First, there must be sufficient cash on hand to fulfill the dividend payment. Second, the company must have sufficient retained earnings; that is, it must have enough residual assets to cover the dividend such that the Retained Earnings account does not become a negative (debit) amount upon declaration. On the day the board of directors votes to declare a cash dividend, a journal entry is required to record the declaration as a liability.

Accounting for Cash Dividends When Only Common Stock Is Issued

Small private companies like La Cantina often have only one class of stock issued, common stock. Assume that on December 16, La Cantina's board of directors declares a $0.50 per share dividend on common stock. As of the date of declaration, the company has 10,000 shares of common stock issued and holds 800 shares as treasury stock. The total cash dividend to be paid is based on the number of shares outstanding, which is the total shares issued less those in treasury. Outstanding shares are 10,000 – 800, or 9,200 shares. The cash dividend is:

The journal entry to record the declaration of the cash dividends involves a decrease (debit) to Retained Earnings (a stockholders' equity account) and an increase (credit) to Cash Dividends Payable (a liability account).

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 9	Retained Earnings	4,600	
	Cash Dividends Payable		4,600
	To record the declaration of a cash dividend		

Figure 5.69 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

While a few companies may use a temporary account, Dividends Declared, rather than Retained Earnings, most companies debit Retained Earnings directly. Ultimately, any dividends declared cause a decrease to Retained Earnings.

The second significant dividend date is the date of record. The date of record determines which shareholders will receive the dividends. There is no journal entry recorded; the company creates a list of the stockholders that will receive dividends.

The date of payment is the third important date related to dividends. This is the date that dividend payments are prepared and sent to shareholders who owned stock on the date of record. The related journal entry is a fulfillment of the obligation established on the declaration date; it reduces the Cash Dividends Payable account (with a debit) and the Cash account (with a credit).

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Oct. 15	Cash Dividends Payable	4,600	
	Cash		4,600
	To record the payment of a cash dividend		

Figure 5.70 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Property Dividends

A property dividend occurs when a company declares and distributes assets other than cash. The dividend typically involves either the distribution of shares of another company that the issuing corporation owns (one of its assets) or a distribution of inventory. For example, **Walt Disney Company** may choose to distribute tickets to visit its theme parks. **Anheuser-Busch InBev**, the company that owns the Budweiser and Michelob brands, may choose to distribute a case of beer to each shareholder. A property dividend may be declared when a company wants to reward its investors but doesn't have the cash to distribute, or if it needs to hold onto its existing cash for other investments. Property dividends are not as common as cash or stock dividends. They are recorded at the fair market value of the asset being distributed. To illustrate accounting for a property dividend, assume that Duratech Corporation has 60,000 shares of $0.50 par value common stock outstanding at the end of its second year of operations, and the company's board of directors declares a property

dividend consisting of a package of soft drinks that it produces to each holder of common stock. The retail value of each case is $3.50. The amount of the dividend is calculated by multiplying the number of shares by the market value of each package:

The declaration to record the property dividend is a decrease (debit) to Retained Earnings for the value of the dividend and an increase (credit) to Property Dividends Payable for the $210,000.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Retained Earnings Property Dividends Payable *To record the declaration of a property dividend*	210,000	210,000

Figure 5.71 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The journal entry to distribute the soft drinks on January 14 decreases both the Property Dividends Payable account (debit) and the Cash account (credit).

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 14	Property Dividends Payable Inventory *To record the distribution of a property dividend*	210,000	210,000

Figure 5.72 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Comparing Small Stock Dividends, Large Stock Dividends, and Stock Splits

Companies that do not want to issue cash or property dividends but still want to provide some benefit to shareholders may choose between small stock dividends, large

stock dividends, and stock splits. Both small and large stock dividends occur when a company distributes additional shares of stock to existing stockholders.

There is no change in total assets, total liabilities, or total stockholders' equity when a small stock dividend, a large stock dividend, or a stock split occurs. Both types of stock dividends impact the accounts in stockholders' equity. A stock split causes no change in any of the accounts within stockholders' equity. The impact on the financial statement usually does not drive the decision to choose between one of the stock dividend types or a stock split. Instead, the decision is typically based on its effect on the market. Large stock dividends and stock splits are done in an attempt to lower the market price of the stock so that it is more affordable to potential investors. A small stock dividend is viewed by investors as a distribution of the company's earnings. Both small and large stock dividends cause an increase in common stock and a decrease to retained earnings. This is a method of capitalizing (increasing stock) a portion of the company's earnings (retained earnings).

Stock Dividends

Some companies issue shares of stock as a dividend rather than cash or property. This often occurs when the company has insufficient cash but wants to keep its investors happy. When a company issues a stock dividend, it distributes additional shares of stock to existing shareholders. These shareholders do not have to pay income taxes on stock dividends when they receive them; instead, they are taxed when the investor sells them in the future.

A stock dividend distributes shares so that after the distribution, all stockholders have the exact same percentage of ownership that they held prior to the dividend. There are two types of stock dividends—small stock dividends and large

stock dividends. The key difference is that small dividends are recorded at market value and large dividends are recorded at the stated or par value.

Small Stock Dividends

A small stock dividend occurs when a stock dividend distribution is less than 25% of the total outstanding shares based on the shares outstanding prior to the dividend distribution. To illustrate, assume that Duratech Corporation has 60,000 shares of $0.50 par value common stock outstanding at the end of its second year of operations. Duratech's board of directors declares a 5% stock dividend on the last day of the year, and the market value of each share of stock on the same day was $9. Figure 5.73 shows the stockholders' equity section of Duratech's balance sheet just prior to the stock declaration.

DURATECH Stockholders' Equity Section of the Balance Sheet For the Month Ended December 31, 2020	
Stockholders' Equity	
Common Stock, $0.50 par value, 100,000 shares authorized, 60,000 shares issued and outstanding	$ 30,000
Additional Paid-in Capital	44,000
Retained Earnings	51,000
Total Stockholders' Equity	$125,000

Figure 5.73 Stockholders' Equity for Duratech *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

The 5% common stock dividend will require the distribution of 60,000 shares times 5%, or 3,000 additional shares of stock. An investor who owns 100 shares will receive 5 shares in the dividend distribution (5% × 100 shares). The journal entry to

record the stock dividend declaration requires a decrease (debit) to Retained Earnings for the market value of the shares to be distributed: 3,000 shares × $9, or $27,000. An increase (credit) to the Common Stock Dividends Distributable is recorded for the par value of the stock to be distributed: 3,000 × $0.50, or $1,500. The excess of the market value over the par value is reported as an increase (credit) to the Additional Paid-in Capital from Common Stock account in the amount of $25,500.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Retained Earnings	27,000	
	Common Stock Dividend Distributable		1,500
	Additional Paid-in Capital from Common Stock		25,500
	To record the declaration of a 5% stock dividend		

Figure 5.74 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

If the company prepares a balance sheet prior to distributing the stock dividend, the Common Stock Dividend Distributable account is reported in the equity section of the balance sheet beneath the Common Stock account. The journal entry to record the stock dividend distribution requires a decrease (debit) to Common Stock Dividend Distributable to remove the distributable amount from that account, $1,500, and an increase (credit) to Common Stock for the same par value amount.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Jan. 7	Common Stock Dividend Distributable	1,500	
	Common Stock		1,500
	To record the distribution of a 5% stock dividend		

Figure 5.75 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

To see the effects on the balance sheet, it is helpful to compare

the stockholders' equity section of the balance sheet before and after the small stock dividend.

DURATECH Stockholders' Equity Section of the Balance Sheet For the Month Ended December 31, 2020			
Stockholders' Equity	**Before the Stock Dividend**	**Stock Dividend Effect**	**After the Stock Dividend**
Common Stock, $0.50 par value	$ 30,000	$ 1,500	$ 31,500
Additional Paid-in Capital	44,000	25,500	69,500
Retained Earnings	51,000	(27,000)	24,000
Total Stockholders' Equity	$125,000	$ 0	$125,000

Figure 5.76 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

After the distribution, the total stockholders' equity remains the same as it was prior to the distribution. The amounts within the accounts are merely shifted from the earned capital account (Retained Earnings) to the contributed capital accounts (Common Stock and Additional Paid-in Capital). However, the number of shares outstanding has changed. Prior to the distribution, the company had 60,000 shares outstanding. Just after the distribution, there are 63,000 outstanding. The difference is the 3,000 additional shares of the stock dividend distribution. The company still has the same total value of assets, so its value does not change at the time a stock distribution occurs. The increase in the number of outstanding shares does not dilute the value of the shares held by the existing shareholders. The market value of the original shares plus the newly issued shares is the same as the market value of the original shares before the stock dividend. For example, assume an investor owns 200 shares with a market value of $10 each for a total market value of $2,000. She receives 10 shares as a stock dividend from the company. She now has 210 shares with a total market value of $2,000. Each share now has a theoretical market value of about $9.52.

Large Stock Dividends

A large stock dividend occurs when a distribution of stock to existing shareholders is greater than 25% of the total outstanding shares just before the distribution. The accounting for large stock dividends differs from that of small stock dividends because a large dividend impacts the stock's market value per share. While there may be a subsequent change in the market price of the stock after a small dividend, it is not as abrupt as that with a large dividend.

To illustrate, assume that Duratech Corporation's balance sheet at the end of its second year of operations shows the following in the stockholders' equity section prior to the declaration of a large stock dividend.

DURATECH Stockholders' Equity Section of the Balance Sheet For the Month Ended December 31, 2020	
Stockholders' Equity	
Common Stock, $0.50 par value, 100,000 shares authorized, 60,000 shares issued and outstanding	$ 30,000
Additional Paid-in Capital	44,000
Retained Earnings	51,000
Total Stockholders' Equity	$125,000

Figure 5.77 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Also assume that Duratech's board of directors declares a 30% stock dividend on the last day of the year, when the market value of each share of stock was $9. The 30% stock dividend will require the distribution of 60,000 shares times 30%, or 18,000 additional shares of stock. An investor who owns 100 shares will receive 30 shares in the dividend distribution (30% × 100 shares). The journal entry to record the stock dividend declaration requires a decrease (debit) to Retained Earnings

and an increase (credit) to Common Stock Dividends Distributable for the par or stated value of the shares to be distributed: 18,000 shares × $0.50, or $9,000. The journal entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Retained Earnings	9,000	
	Common Stock Dividends Distributable		9,000
	To record the declaration of a 30% stock dividend		

Figure 5.78 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The subsequent distribution will reduce the Common Stock Dividends Distributable account with a debit and increase the Common Stock account with a credit for the $9,000.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
Dec. 31	Common Stock Dividends Distributable	9,000	
	Common Stock		9,000
	To record the distribution of a 30% stock dividend		

Figure 5.79 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

There is no consideration of the market value in the accounting records for a large stock dividend because the number of shares issued in a large dividend is large enough to impact the market; as such, it causes an immediate reduction of the market price of the company's stock.

In comparing the stockholders' equity section of the balance sheet before and after the large stock dividend, we can see that the total stockholders' equity is the same before and after the stock dividend, just as it was with a small dividend (Figure 5.80).

DURATECH Stockholders' Equity Section of the Balance Sheet For the Month Ended December 31, 2020			
Stockholders' Equity	**Before the Stock Dividend**	**Stock Dividend Effect**	**After the Stock Dividend**
Common Stock, $0.50 par value	$ 30,000	$ 9,000	$ 39,000
Additional Paid-in Capital	44,000		44,000
Retained Earnings	51,000	(9,000)	42,000
Total Stockholders' Equity	$125,000	$ 0	$125,000

Figure 5.80 Stockholders' Equity Section of the Balance Sheet for Duratech *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Similar to distribution of a small dividend, the amounts within the accounts are shifted from the earned capital account (Retained Earnings) to the contributed capital account (Common Stock) though in different amounts. The number of shares outstanding has increased from the 60,000 shares prior to the distribution, to the 78,000 outstanding shares after the distribution. The difference is the 18,000 additional shares in the stock dividend distribution. No change to the company's assets occurred; however, the potential subsequent increase in market value of the company's stock will increase the investor's perception of the value of the company.

Stock Splits

A traditional stock split occurs when a company's board of directors issue new shares to existing shareholders in place of the old shares by increasing the number of shares and reducing the par value of each share. For example, in a 2-for-1 stock split, two shares of stock are distributed for each share held by a shareholder. From a practical perspective, shareholders return the old shares and receive two shares for

each share they previously owned. The new shares have half the par value of the original shares, but now the shareholder owns twice as many. If a 5-for-1 split occurs, shareholders receive 5 new shares for each of the original shares they owned, and the new par value results in one-fifth of the original par value per share.

While a company technically has no control over its common stock price, a stock's market value is often affected by a stock split. When a split occurs, the market value per share is reduced to balance the increase in the number of outstanding shares. In a 2-for-1 split, for example, the value per share typically will be reduced by half. As such, although the number of outstanding shares and the price change, the total market value remains constant. If you buy a candy bar for $1 and cut it in half, each half is now worth $0.50. The total value of the candy does not increase just because there are more pieces.

A stock split is much like a large stock dividend in that both are large enough to cause a change in the market price of the stock. Additionally, the split indicates that share value has been increasing, suggesting growth is likely to continue and result in further increase in demand and value. Companies often make the decision to split stock when the stock price has increased enough to be out of line with competitors, and the business wants to continue to offer shares at an attractive price for small investors.

CONCEPTS IN PRACTICE

Samsung Boasts a 50-to-1 Stock Split

In May of 2018, **Samsung Electronics**[18] had a 50-to-1 stock split in an attempt to make it easier for investors to buy its

stock. **Samsung**'s market price of each share prior to the split was an incredible 2.65 won ("won" is a Japanese currency), or $2,467.48. Buying one share of stock at this price is rather expensive for most people. As might be expected, even after a slight drop in trading activity just after the split announcement, the reduced market price of the stock generated a significant increase to investors by making the price per share less expensive. The split caused the price to drop to 0.053 won, or $49.35 per share. This made the stock more accessible to potential investors who were previously unable to afford a share at $2,467.

A reverse stock split occurs when a company attempts to increase the market price per share by reducing the number of shares of stock. For example, a 1-for-3 stock split is called a reverse split since it reduces the number of shares of stock outstanding by two-thirds and triples the par or stated value per share. The effect on the market is to increase the market value per share. A primary motivator of companies invoking reverse splits is to avoid being delisted and taken off a stock exchange for failure to maintain the exchange's minimum share price.

Accounting for stock splits is quite simple. No journal entry is recorded for a stock split. Instead, the company prepares a memo entry in its journal that indicates the nature of the stock split and indicates the new par value. The balance sheet will reflect the new par value and the new number of shares authorized, issued, and outstanding after the stock split. To illustrate, assume that Duratech's board of directors declares a 4-for-1 common stock split on its $0.50 par value stock. Just before the split, the company has 60,000 shares of common stock outstanding, and its stock was selling at $24 per share. The split causes the number of shares outstanding to increase by four times to 240,000 shares (4 × 60,000), and the par value

to decline to one-fourth of its original value, to $0.125 per share ($0.50 ÷ 4). No change occurs to the dollar amount of any general ledger account.

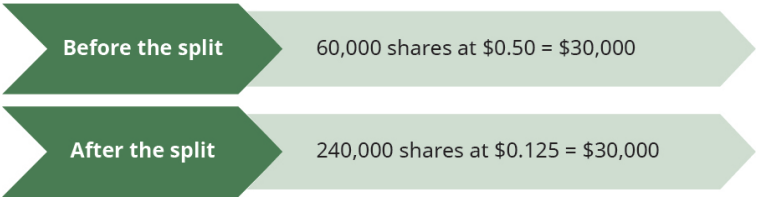


Figure 5.81 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The split typically causes the market price of stock to decline immediately to one-fourth of the original value—from the $24 per share pre-split price to approximately $6 per share post-split ($24 ÷ 4), because the total value of the company did not change as a result of the split. The total stockholders' equity on the company's balance sheet before and after the split remain the same.

DURATECH
Stockholders' Equity Section of the Balance Sheet
For the Month Ended December 31, 2020

Stockholders' Equity	Before the Stock Split	Stock Split Effect	After the Stock Split
Common Stock	$ 30,000	$ 0	$ 30,000
Additional Paid-in Capital	44,000		44,000
Retained Earnings	51,000	0	51,000
Total Stockholders' Equity	$125,000	$ 0	$125,000

Figure 5.82 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=299#oembed-1

YOUR TURN

Dividend Accounting

Cynadyne, Inc.'s has 4,000 shares of $0.20 par value common stock authorized, 2,800 issued, and 400 shares held in treasury at the end of its first year of operations. On May 1, the company declared a $1 per share cash dividend, with a date of record on May 12, to be paid on May 25. What journal entries will be prepared to record the dividends?

Solution

A journal entry for the dividend declaration and a journal entry for the cash payout:

To record the declaration:

May 1	Retained Earnings Dividends Payable *To record board of directors authorizing cash dividends*	2,400	2,400

Figure 5.83 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Date of declaration, May 12, no entry.

To record the payment:

May 25	Dividends Payable Cash *To record cash payout of dividends*	2,400	2,400

Figure 5.84 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Long Descriptions

Duratech, Stockholders' Equity Section of the Balance Sheet, For the Month Ended December 31, 2020. Stockholders' Equity: Common Stock, $0.50 par value, 100,000 shares authorized, 60,000 issued and outstanding $30,000. Additional Paid-in capital 44,000. Retained Earnings 51,000. Total stockholders' equity $125,000. Return

Duratech, Stockholders' Equity Section of the Balance Sheet, For the Month Ended December 31, 2020. Stockholders' Equity, Before the Stock Dividend, Stock Dividend Effect, After the Stock Dividend (respectively): Common stock, $0,50 par value $30,000, 1,500, $31,500. Additional paid-in capital 44,000, 25,500, 69,500. Retained earnings 51,000, (27,000), 24,000. Total stockholders' equity $125,000, 0, $125,000. Return

Duratech, Stockholders' Equity Section of the Balance Sheet, For the Month Ended December 31, 2020. Stockholders' Equity: Common Stock, $0.50 par value, 100,000 shares authorized, 60,000 issued and outstanding $30,000. Additional Paid-in capital 44,000. Retained Earnings 51,000. Total stockholders' equity $125,000. Return

Duratech, Stockholders' Equity Section of the Balance Sheet, For the Month Ended December 31, 2020. Stockholders' Equity, Before the Stock Dividend, Stock Dividend Effect, After the Stock Dividend (respectively): Common stock, $0.50 par value $30,000, 9,000, $39,000. Additional paid-in capital 44,000, -,

44,000. Retained earnings 51,000, (9,000), 42,000. Total stockholders' equity $125,000, 0, $125,000. Return

Duratech, Stockholders' Equity Section of the Balance Sheet, For the Month Ended December 31, 2020. Stockholders' Equity, Before the Stock Split, Stock Split Effect, After the Stock Split (respectively): Common stock, $30,000, 0, $30,000. Additional paid-in capital 44,000, -, 44,000. Retained earnings 51,000, 0, 51,000. Total stockholders' equity $125,000, 0, $125,000. Return

Footnotes

- 16 Ironman at Political Calculations. "Dividends by the Numbers through January 2018." Seeking Alpha. February 9, 2018. https://seekingalpha.com/article/4145079-dividends-numbers-january-2018
- 17 Jing Pan. "Will Costco Wholesale Corporation Pay a Special Dividend in 2018?" Income Investors. May 9, 2018. https://www.incomeinvestors.com/will-costco-wholesale-corporation-pay-special-dividend-2018/38865/
- 18 Joyce Lee. "Trading in Samsung Electronics Shares Surges after Stock Split." *Reuters*. May 3, 2018. https://www.reuters.com/article/us-samsung-elec-stocks/samsung-elec-shares-open-at-53000-won-each-after-501-stock-split-idUSKBN1I500B

5.11 Earnings per Share (EPS)

Earnings per share (EPS) measures the portion of a corporation's profit allocated to each outstanding share of common stock. Many financial analysts believe that EPS is the single most important tool in assessing a stock's market price. A high or increasing earnings per share can drive up a stock price. Conversely, falling earnings per share can lower a stock's market price. EPS is also a component in calculating the price-to-earnings ratio (the market price of the stock divided by its earnings per share), which many investors find to be a key indicator of the value of a company's stock.

CONCEPTS IN PRACTICE

Microsoft Earnings Announcements Exceeds Wall Street Targets

While a company's board of directors makes the final approval of the reports, a key goal of each company is to look favorable to investors while providing financial statements that accurately reflect the financial condition of the company. Each quarter, public companies report EPS through a public announcement as one of the key measures of their profitability. These announcements are highly anticipated by investors and analysts. The suspense is heightened because analysts provide earnings estimates to the public prior to each announcement

release. According to Matt Weinberger of *Business Insider*, the announcement by **Microsoft** of its first quarter 2018 EPS reported at $0.95 per share, higher than analysts' estimates of $0.85 per share, caused the value of its stock to rise by more than 3% within hours of the announcement.[19] While revenue was the other key metric in **Microsoft**'s earnings announcement, EPS carried more weight in the surge of the company's market price.

Calculating Earnings per Share

Earnings per share is the profit a company earns for each of its outstanding common shares. Both the balance sheet and income statement are needed to calculate EPS. The balance sheet provides details on the preferred dividend rate, the total par value of the preferred stock, and the number of common shares outstanding. The income statement indicates the net income for the period. The formula to calculate basic earnings per share is:

$$\text{Earnings per Share} = \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Weighted Average Common Shares Outstanding}}$$

Figure 5.85 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

By removing the preferred dividends from net income, the numerator represents the profit available to common shareholders. Because preferred dividends represent the amount of net income to be distributed to preferred shareholders, this portion of the income is obviously not available for common shareholders. While there are a number

of variations of measuring a company's profit used in the financial world, such as NOPAT (net operating profit after taxes) and EBITDA (earnings before interest, taxes, depreciation, and amortization), GAAP requires companies to calculate EPS based on a corporation's net income, as this amount appears directly on a company's income statement, which for public companies must be audited.

In the denominator, only common shares are used to determine earnings per share because EPS is a measure of earnings for each common share of stock. The denominator can fluctuate throughout the year as a company issues and buys back shares of its own stock. The weighted average number of shares is used on the denominator because of this fluctuation. To illustrate, assume that a corporation began the year with 600 shares of common stock outstanding and then on April 1 issued 1,000 more shares. During the period January 1 to March 31, the company had the original 600 shares outstanding. Once the new shares were issued, the company had the original 600 plus the new 1,000 shares, for a total of 1,600 shares for each of the next nine months—from April 1 to December 31. To determine the weighted average shares, apply these fractional weights to both of the stock amounts, as shown in Figure 5.86.

Number of Shares	×	Portion of Year	=	Weighted Shares
600	×	3/12	=	150
1,600	×	9/12	=	1,200
Weighted average shares				1,350

Figure 5.86 Weighted Shares *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

If the shares were not weighted, the calculation would not consider the time period during which the shares were outstanding.

To illustrate how EPS is calculated, assume Sanaron

Company earns $50,000 in net income during 2020. During the year, the company also declared a $10,000 dividend on preferred stock and a $14,000 dividend on common stock. The company had 5,000 common shares outstanding the entire year along with 2,000 preferred shares. Sanaron has generated $8 of earnings ($50,000 less the $10,000 of preferred dividends) for each of the 5,000 common shares of stock it has outstanding.

Measuring Performance with EPS

EPS is a key profitability measure that both current and potential common stockholders monitor. Its importance is accentuated by the fact that GAAP requires public companies to report EPS on the face of a company's income statement. This is only ratio that requires such prominent reporting. If fact, public companies are required to report two different earnings per share amounts on their income statements—basic and diluted. We've illustrated the calculation of basic EPS. Diluted EPS, which is not demonstrated here, involves the consideration of all securities such as stocks and bonds that could potentially dilute, or reduce, the basic EPS.

Earnings per share is interpreted differently by different analysts. Some financial experts favor companies with higher EPS values. The reasoning is that a higher EPS is a reflection of strong earnings and therefore a good investment prospect. A more meaningful analysis occurs when EPS is tracked over a number of years, such as when presented in the comparative income statements for **Cracker Barrel Old Country Store, Inc.**'s respective year ends in 2017, 2016, and 2015 shown in Figure 5.87.[20] **Cracker Barrel**'s basic EPS is labeled as "net income per share: basic."

CRACKER BARREL OLD COUNTRY STORE, INC. Consolidated Statements of Income			
	(In thousands except share data) Fiscal years ended		
	July 28, 2017	July 29, 2016	July 31, 2015
Total Revenue	$ 2,926,289	$ 2,912,351	$ 2,842,284
Cost of Goods Sold (exclusive of depreciation and rent)	891,293	928,176	924,171
Labor and other related expenses	1,017,124	1,006,188	992,382
Other Store Operating Expenses	563,300	554,534	523,307
Store Operating Income	454,572	423,453	402,424
General and Adminstrative Expenses	141,414	142,982	147,544
Operating Income	313,158	280,471	254,880
Interest Expense	14,271	14,052	16,679
Income before income taxes	298,887	266,419	238,201
Provision for income taxes	96,988	77,120	74,298
Net Income	$ 201,899	$ 189,299	$ 163,903
Net Income per share: basic	$ 8.40	$ 7.91	$ 6.85
Net Income per share: diluted	$ 8.37	$ 7.86	$ 6.82
Basic weighted average shares outstanding	**24,031,810**	**23,945,041**	**23,918,368**
Diluted weighted average shares outstanding	**24,118,288**	**24,074,273**	**24,048,924**

Figure 5.87 Consolidated Statements of Income for Cracker Barrel *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Most analysts believe that a consistent improvement in EPS year after year is the indication of continuous improvement in the earning power of a company. This is what is seen in **Cracker Barrel**'s EPS amounts over each of the three years reported, moving from $6.85 to $7.91 to $8.40. However, it is important to remember that EPS is calculated on historical data, which is not always predictive of the future. In addition, when EPS is used to compare different companies, significant differences may exist. If companies are in the same industry, that comparison may be more valuable than if they are in different industries. Basically, EPS should be a tool used in decision-making, utilized alongside other analytic tools.

YOUR TURN

Would You Have Invested?

What if, in 1997, you invested $5,000 in **Amazon**? Today, your investment would be worth nearly $1 million. Potential investors viewing **Amazon**'s income statement in 1997 would have seen an EPS of a negative $0.11. In other words, **Amazon** lost $0.11 for each share of common stock outstanding. Would you have invested?

Solution

Answers will vary. A strong response would include the idea that a negative or small EPS reflects upon the past historical operations of a company. EPS does not predict the future. Investors in 1997 looked beyond Amazon's profitability and saw its business model having strong future potential.

Long Descriptions

Cracker Barrel Old Country Store, Inc. Consolidated Statements of Income (In thousands except share data) Fiscal years ended July 28, 2017, July 29, 2016, and July 31, 2015 (respectively): Total Revenue $2,926,289, 2,912,351, 2,842,284. Less Cost of goods sold (exclusive of depreciation and rent) 891,293, 928,176, 924,171. Less Labor and other related expenses 1,017,124, 1,066,188, 992,382. Less Other store operating expenses 563,300, 554,534, 523,307. Equals Store operating income 454,572, 423,453, 402,424. Less General and administrative expenses 141,414, 142,982, 147,544. Equals Operating income 313,158, 280,471, 254,880. Less Interest expense 14,271, 14,052, 16,679. Equals Income before income taxes, 298,887, 266,419, 238. Less Provision for income taxes 96,988, 77,120, 74,298. Equals Net

income 201,899, 189,299, 163,903. Net income per share: basic $8.40, 7.91, 6.85. Net income per share: diluted $8.37, 7.86, 6.82. Basic weighted average shares outstanding 24,031,810, 23,945,041, 23,918,368. Diluted weighted average shares outstanding 24,118,288, 24,074,273, 24,048,924. Return

Footnotes

- 19 Matt Weinberger. "Microsoft's Cloud Business Is Driving a Revenue Surge That's Well above Wall Street Targets." *Business Insider.* April 26, 2018. https://www.businessinsider.com/microsoft-q3-fy18-earnings-revenue-eps-analysis-2018-4
- 20 Cracker Barrel. *Cracker Barrel Old Country Store 2017 Annual Report.* September 22, 2017. http://investor.crackerbarrel.com/static-files/c05f90b8-1214-4f50-8508-d9a70301f51f

CHAPTER 6- INTRODUCTION TO MANAGERIAL ACCOUNTING

Managerial Accounting- The Language of Management/Insiders

6.1 Defining Managerial Accounting

Financial accounting process provides a useful level of detail for external users, such as investors and creditors, but it does not provide enough detailed information for the types of decisions made in the day-to-day operation of the business or for the types of decisions that guide the company long term. Managerial accounting is the process that allows decision makers to set and evaluate business goals by determining what information they need to make a particular decision and how to analyze and communicate this information. Let's explore the role of managerial accounting in several different organizations and at different levels of the organization, and then examine the primary responsibilities of management.

Three friends who are recent graduates from business school, Alex, Hana, and Gillian, have each just begun their first postgraduation jobs. They meet for lunch and discuss what each of their jobs entails. Alex has taken a position as a market analyst for a Fortune 500 company that operates in the shipping industry. Her first assignment is to suggest and evaluate ways the company can increase the revenue from shipping contracts by 10 percent for the year. Before tackling this project, she has a number of questions. What is the purpose of this analysis? What type of information does she need? Where would she find this information? Can she get it from a basic income statement and balance sheet? How will she know if her suggestions for pricing are creating more shipping contracts and helping to meet the company's goal? She begins with an analysis of the company's top fifty customers, including the prices they pay, discounts offered,

discounts applied, frequency of shipments, and so on, to determine if there are price adjustments that need to be made to attract those customers to use the company's shipping services more frequently.

Hana has a position in the human resources department of a pharmaceutical company and is asked to research and analyze a new trend in compensation in which employers are forgoing raises to employees and are instead giving large bonuses for meeting certain goals. Her task is to ascertain if this new idea would be appropriate for her company. Her questions are similar to Alex's. What information does she need? Where would she find this information? How would she determine the impact of this type of change on the business? If implemented, what information would she need to assess the success of the plan?

Gillian is working in the supply chain area of a major manufacturer that produces the various mirrors found on cars and trucks. Her first assignment is to determine whether it is more cost effective and efficient for her company to make or purchase a bracket used in the assembly of the mirrors. Her questions are also similar to her friends' questions. Why is the company considering this decision? What information does she need? Where would she find this information? Would choosing the option with the lowest cost be the correct choice?

The women are surprised by how similar their questions are despite how different their jobs are. They each are assigned tasks that require them to use various forms of information from many different sources to answer an important question for their respective companies. Table 6.1 provides possible answers to each of the questions posed in these scenarios.

Table 6.1 Managerial Accounting and Various Business Roles By: Rice University Openstax CC BY NC SA 4.0

Questions	Possible Answers
Alex, Marketing Analyst	
What is the purpose of this analysis?	To determine a better way to price their services
What type of information does she need?	Financial and nonfinancial information, such as the number of contracts per client
Where would she find this information?	Financial statements, customer contracts, competitor information, and customer surveys
Can she get it from a basic income statement and balance sheet?	No, she would need to use many other sources of information
How will she know if her suggestions for pricing are creating more shipping contracts and helping to meet the company's goal?	By using a means to evaluate the success, such as by comparing the number of contracts received from each company before the new pricing structure with the number received after the pricing change of contracts
Hana, Human Resources	
What information does she need?	Financial and nonfinancial information, such as how other companies have implemented this idea, including the amount of the bonus and the types of measures on which the bonus was measured
Where would she find this information?	Mostly from internal company sources, such as employee performance records, but also from industry and competitor sources
How would she determine the impact of this type of change on the business?	Perform surveys to determine the effect of the bonus method on employee morale and employee turnover; she could determine the effect on gross revenue of annual bonuses versus annual raises

Questions	Possible Answers
If implemented, what information would she need to assess the success of the plan?	Measuring employee turnover; evaluating employee satisfaction after the change; assessing whether the performance measures being used to determine the bonus were measures that truly impacted the company in a positive manner
Gillian, Supply Chain	
Why is the company considering this decision?	Management likely wants to minimize costs, and this particular part is one they believe may be more cost effective to buy than to make
What information does she need?	She needs the cost to buy the part as well as all the costs that would be incurred to make the part; whether her company has the ability (capacity) to make the part; the quality of the part if they buy it compared to if they make it; the ability of a supplier of the part to deliver on time
Where would she find this information?	She would find the information from internal records about production costs, from cost details provided by the external producer, and from industry reports on the quality of production from the external supplier
Would choosing the option with the lowest cost be the correct choice?	The lowest-cost option may not be the best choice if the quality is subpar, if the part is not delivered in a timely manner and thus throws off or slows production, or if the use of a purchased part will affect the relationship between the company and the car manufacturer to whom the mirror is ultimately sold

The questions the women have and the answers they require show that there are many types of information that a company needs to make business decisions. Although none of these individuals is given the title of manager, they need information to help provide management with the information necessary to make decisions to move the company forward with its strategic plan. The scenarios of the three women are not unique. These types of questions occur every day in businesses across the world.

Some decisions will be more clearly appropriate for higher-

level management. For example, Lynx Boating Company produces three different lines of boats (sport boats, pontoon boats, and large cruisers). All three boat lines are profitable, but the pontoon boat line seems to be less profitable than the other two types of boats. Management may want to consider abandoning the pontoon line and using that additional capacity to produce one of the other more profitable lines. They would need detailed financial information in order to make such a decision.

Service organizations also face decisions that require more detailed information than is available in financial accounting statements. A company's financial statements aggregate information for the company as a whole, but for most managerial decisions, information must be gathered in a timely manner at a product, customer, or division level. For example, the management of City Hospital is considering the purchase of four new magnetic resonance imaging (MRI) machines that scan three times faster than their current machines and thus would allow the hospital's imaging department to evaluate eight additional patients each day. Each machine costs $425,000 and will last five years before needing to be replaced. Would this be a wise investment for City Hospital? Hospital management would need the appropriate information to assess the alternatives in order to make this decision. Throughout your study of managerial accounting, you will learn about the types of information needed to make these decisions, as well as techniques for analyzing this information. First, it is important to understand the various roles managers play in the organization in order to understand the types of information and the level of detail that are needed. Most of the job responsibilities of a manager fit into one of three categories: planning, controlling, or evaluating.

The model in Figure 6.1 sums up the three primary responsibilities of management and the managerial

accountant's role in the process. As you can see from the model, the function of accomplishing an entity's mission statement is a circular, ongoing process.

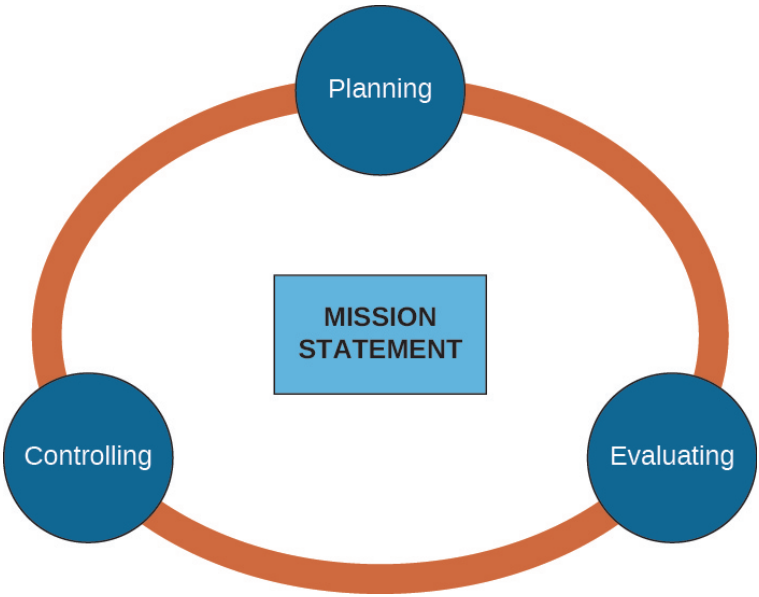


Figure 6.1 The Process of Adhering to the Mission Statement *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Planning

One of the first items on a new company's agenda is the creation of a mission statement. A mission statement is a short statement of a company's purpose and focus. This statement should be broad enough that it will encompass future growth and changes of the company. Table 6.2 contains the mission statement of three different types of companies: a manufacturer, an e-commerce company, and a service company.

Table 6.2 Sample Mission Statements By: Rice University Openstax CC BY NC SA 4.0

Company	Mission Statement
Dow Chemical	"To passionately create innovation for our stakeholders at the intersection of chemistry, biology, and physics."[1]
Starbucks	"To inspire and nurture the human spirit—one person, one cup, and one neighborhood at a time."[2]
Google	"Our mission is to organize the world's information and make it universally accessible and useful."[3]

Once the mission of the company has been determined, the company can begin the process of setting goals, or what the company expects to accomplish over time, and objectives, or the targets that need to be met in order to meet the company's goals. This is known as planning. Planning occurs at all levels of an organization and can cover various periods of time. One type of planning, called strategic planning, involves setting priorities and determining how to allocate corporate resources to help an organization accomplish both short-term and long-term goals. For example, one hotel may want to be the low-price, no-frills, clean alternative, while another may decide to be the superior quality, high-price luxury hotel with many amenities. Obviously, to be successful, either of these businesses must determine the goals necessary to meet their particular strategy.

Typically, a strategic plan will span any number of years an organization chooses (three, five, seven, or even ten years), and often companies will have multiple strategic plans, such as one for three years, one for five years, and one for ten years. Given the time length involved in many plans, the organization also needs to factor in the potential effects of changes in their senior executive leadership and the composition of the board of directors.

What types of objectives are part of a strategic plan? Strategic objectives should be diverse and will vary from company to company and from industry to industry, but some

general goals can include maximizing market share, increasing short-term profits, increasing innovation, offering the best value for the cost, maintaining commitment to community programs, and exceeding environmental protection mandates.

From a managerial accounting perspective, planning involves determining steps or actions to meet the strategic or other goals of the company. For example, Daryn's Dairy, a major producer of organic dairy products in the Midwest, has made increasing the market share of its products one of its strategic goals. However, to be truly effective, the goals need to be defined specifically. For example, the goals might be stated in terms of percentage growth, both annually and in terms of the number of markets addressed in their growth projections.

Also, Daryn's planning process would include the steps the company plans to use to implement to increase market share. These plans may include current-year plans, five-year plans, and ten-year plans.

The current-year plan may be to sell the company's products in 10 percent more stores in the states in which it currently operates. The five-year plan may be to sell the products internationally in three countries, and the ten-year plan may be to acquire their chief competitor and, thus, their customers. Each of these plans will require outlining specific steps to reach these goals and communicating those steps to the employees who will carry out or have an impact on reaching these goals and implementing these plans.

Planning can involve financial and nonfinancial processes and measures. One planning tool discussed in Budgeting is the budgeting process, which requires management to assess the resources—for example, time, money, and number and type of employees needed—to meet current-year objectives. Budgeting often includes both financial data, such as worker pay rates, and nonfinancial data, such as the number of customers an employee can serve in a given time period.

A retail company can plan for the expected sales volume,

a hospital can plan for the number of x-rays they expect to administer, a law firm can plan the hours expected for the various types of legal services they perform, a manufacturing firm can plan for the level of quality expected in each item produced, and a utility company can plan for the level of air pollutants that are acceptable. Notice that in each of these examples, the aspect of the business that is being planned and evaluated is a qualitative (nonfinancial) factor or characteristic. In your study of managerial accounting, you will learn about many situations in which both financial and nonfinancial data or information are equally relevant. However, the qualitative aspects are typically not quantified in dollars but evaluated using some other standards, such as customers served or students advised.

While these functions are initially stated in qualitative terms, most of these items would at some point be translated into a dollar value or dollar effect. In each of these examples, the managerial accounting function would help to determine the variables that would help appropriately measure the desired goal as well as plan how to quantify these measures. However, measures are only useful if tracked and used to determine their effectiveness. This is known as the control function of management.

Controlling

To measure whether plans are meeting objectives or goals, management must put in place ways to assess success or lack of success. Controlling involves the monitoring of the planning objectives that were put into place. For example, if you have a retail store and you have a plan to minimize shoplifting, you can implement a control, such as antitheft tags that trigger an alarm when someone removes them from the store. You could also install in the ceilings cameras that provide a different view

of customers shopping and therefore may catch a thief more easily or clearly. The antitheft tags and cameras serve as your controls against shoplifting.

Managerial accounting is a useful tool in the management control function. Managerial accounting helps determine the appropriate controls for measuring the success of a plan. There are many types of controls that a company can use. Some controls can be in the form of financial measures, such as the ratio for inventory turnover, which is a measure of inventory control and is defined as Cost of Goods Sold ÷ Average Inventory, or in the form of a performance measure, such as decreasing production costs by 10 percent to help guide or control the decisions made by managers. Other controls can be physical controls, such as fingerprint identification or password protection. Essentially, the controlling function in management involves helping to coordinate the day-to-day activities of a business so that these activities lead to meeting corporate goals.

Without controls, it is very unlikely a plan would be successful, and it would be difficult to know if your plan was a success. Consider the plan by Daryn's Dairy to increase market share. The plan for the first year was to increase market share by selling the company's products in 10 percent more stores in the states in which the company already operates. How will the company implement this plan? The implementation, or carrying out, of the plan will require the company to put controls in place to measure which new stores are successfully selling the company's products, which products are being sold the most, what the sales volume and dollar value of the new stores are, and whether the sales in these new stores are affecting the volume of sales in current stores. Without this information, the company would not know if the plan is reaching the desired result of increased market share.

The control function helps to determine the courses of action that are taken in the implementation of a plan by helping to

define and administer the steps of the plan. Essentially, the control function facilitates coordination of the plan within the organization. It is through the system of controls that the actual results of decisions made in implementing a plan can be identified and measured. Managerial accounting not only helps to determine and design control measures, it also assists by providing performance reports and control reports that focus on variances between the planned objective performance and the actual performance. Control is achieved through effective feedback, or information that is used to assess a process. Feedback allows management to evaluate the results, determine whether progress is being made, or determine whether corrective measures need to be taken. This evaluation is in the next management function.

Evaluating

Managers must ultimately determine whether the company has met the goals set in the planning phase. Evaluating, also called *assessing* or *analyzing*, involves comparing actual results against expected results, and it can occur at the product, department, division, and company levels. When there are deviations from the stated objectives, managers must decide what modifications are needed.

The controls that were put into place to coordinate the implementation of a particular company plan must be evaluated so that success can be measured, or corrective action can be taken. Consider Daryn's Dairy's one-year plan to increase market share by selling products in 10 percent more stores in the states in which the company currently operates. Suppose one of the controls put into place is to measure the sales in the current stores to determine if selling the company's products in new stores is adding new sales or merely moving sales from existing stores. This control measure, same-store

sales, must be evaluated to determine the effect of the decision to expand the selling of products within the state. This control measure will be evaluated by comparing sales in the current year in those stores to sales from the prior year in those same stores. The results of this evaluation will help guide management in their decision to move forward with their plan, to modify the plan, or to scrap the plan.

As discussed previously, not all evaluations will involve quantitative or financial measures. In expanding market share, the company wants to maintain or improve its reputation with customers and does not want the planned increased availability or easier access to their products to decrease customer perceptions of the products or the company. They could use customer surveys to evaluate the perceived effect on the company's reputation as a result of implementing this one-year plan. However, there are many ways that companies can evaluate various controls. In addition to the financial gauges, organizations are now measuring efficiencies, customer development, employee retention, and sustainability.

Managers spend their time in various stages of planning, controlling, and evaluating. Generally, higher-level managers spend more time on planning, whereas lower-level managers spend more time on evaluating. At any level, managers work closely with the managerial accounting team to help in each of these stages. Managerial accountants help determine whether plans are measurable, what controls should be implemented to carry out a plan, and what are the proper means of evaluation of those controls. This would include the type of feedback necessary for management to assess the results of their plans and actions. Management accountants generate the reports and information needed to assess the results of the various evaluations, and they help interpret the results.

To put this in context, think about how you will spend your weekend. First, you are the manager of your own time. You must plan based on your workload and on how much time

you will spend studying, exercising, sleeping, and meeting with friends. You then control how your plan is implemented by setting self-imposed or possibly group meeting–imposed deadlines, and last, you evaluate how well you carried out your plan by gathering more data—such as grades on assignments, personal fulfillment, and number of hours of sleep—to determine if you met your plans (goals). Not planning, controlling, and evaluating often results in less-than-desirable outcomes, such as late assignments, too little sleep, or bad grades. In this scenario, you did not need a separate managerial accountant to help you with these functions, because you could manage planning, controlling, and evaluating on your own. However, in the business world, most businesses will have both managers and managerial accountants. Table 6.3 illustrates some examples.

Table 6.3 Relating Managerial Accounting Functions to Various Business Majors By: Rice University Openstax CC BY NC SA 4.0

–	Sales	Human Resources	Logistics
Planning	What are our expected sales for each product in each geographic region? How much should be budgeted for salaries and commissions for our salespeople?	How much should we budget for salary and wage increases for the year? How much should we plan to spend on safety and training for the year?	Should we invest in radio-frequency identification (RFID) processors to enable computer tracking of inventory? How much raw material should be ordered and delivered to ensure timely delivery of our finished products to our customers?
Controlling	Are we meeting expected sales growth in each region? Are each of the salespeople meeting their sales projections?	Is our projected budget for wages and salaries sufficient? Are we meeting our safety and training goals?	Are our products being delivered to our customers in a timely manner, and at what cost? Are we dealing with stock-outs in inventory? If so, what is that costing us?
Evaluating	How do our actual sales compare to our forecasted or budgeted sales? What sales promotions are our competitors offering, and what effect is it having on our market share?	Would it be cheaper to hire temporary employees to get through our “busy” season or to pay our current employees for overtime?	What are the cost differences in starting our own delivery service versus continuing to use other carriers? Should we outsource the manufacturing of a component part or continue to make it ourselves? What are the price differences?

YOUR TURN

Evaluating On-Campus versus Off-Campus Living

The principal purpose of managerial accounting is to deliver information useful for management decision-making. Many of the techniques used in managerial accounting are useful for decisions in your everyday life. In choosing whether to live on campus or off campus, how might you use planning, controlling, and evaluating in your decision-making process? What types of financial and nonfinancial information might you need?

Solution

Planning:

- Creating a list of financial and nonfinancial goals to be accomplished in your next year in college
- Determining how much each alternative will cost, including utilities, food, and transportation, and creating a budget

Controlling:

- Using an expense recording app to monitor your expenses
- Monitoring the effectiveness of your study time as reflected in your grades
- Monitoring your physical health to measure if your living arrangements are conducive to staying healthy

Evaluating:

- Assessing the effectiveness of your living arrangements by measuring your grades, bank account, and general

happiness

Financial:

- Cost of staying in dorm versus the cost of an apartment or house
- Estimate of differences in other costs, such as utilities, food, and additional transportation

Nonfinancial:

- Convenience of location of dorm versus apartment or house
- Quality of living experience including number of roommates, ability to have own room, study environment differences
- Length of rental term of dorm versus apartment or house
- Where you plan to live in the summer, what you plan to do during that time

Footnotes

- 1 "Mission and Vision." DOW. https://www.dow.com/en-us/about-dow/our-company/mission-and-vision
- 2 "Our Starbucks Mission Statement." Starbucks. https://www.starbucks.com/about-us/company-information/mission-statement
- 3 "About." Google. https://www.google.com/about/

6.2 Roles & Duties of Managerial Accountants

It is clear that management accountants must have a solid foundation in accounting, in both financial and managerial accounting, but other than accounting skills, what makes good managerial accountants?

- They must have knowledge of the business in which they are working. Commercial awareness is knowing how a business is run and how it is influenced by the external environment and knowing and understanding the overall industry within which the business is operating.
- Collaboration, which involves working in cross-functional teams and earning the trust and respect of colleagues in order to complete a task, is vital to improving managerial accounting talents. They should be "team players."
- Management accountants should have effective communication skills that allow them to convey accounting information in both written and oral forms in a way that the intended audience can understand. Being able to gather the data quickly and accurately is important, but the data is meaningless if it is not presented in an intuitive style that the audience can understand.
- Strong technology skills are also essential. These skills include not only accounting and reporting software but also other programs that would assist in automating processes, improving efficiencies, and adding value to the company. For many companies, additional software and

accompanying technology are often needed for both their financial and managerial accounting functions. For example, *enterprise resource planning* (ERP) systems often play a major role in the creation of comprehensive accounting systems. This additional support is often provided by outside suppliers such as **Hyperion**, **Cognos**, **Sage**, **SAP**, **PeopleSoft**, and **Oracle**.

- Managerial accountants must possess extensive analytical skills. They must regularly work with financial analysts and management personnel to find ways to reduce expenses and analyze budgets. These skills include the ability to envision, verbalize, conceptualize, or solve both multifaceted and simplistic problems by making choices that make sense with the given information.
- Managerial accountants must have ethics and values. They should be an example to others and encourage them to follow internal control practices and procedures.

Managers at all levels make many different types of decisions every day, but to make most decisions, they need specific information. Some information is easily obtainable, and some is not. Managers do not always know what information they need or what is available, and they need to know if the decisions they make are having the desired outcome and meeting specific goals.

To this point, we've described *managerial accounting* as a process. The following definition considers it a profession. Management accountants are the individuals who help management with this information. The Institute of Management Accountants (IMA) defines management accounting as "a profession that involves partnering in management decision making, devising planning and performance management systems, and providing expertise in financial reporting and control to assist management in the

formulation and implementation of an organization's strategy."[4]

The IMA also reports that nearly 75 percent of financial professionals work in business as management accountants in positions such as financial analysts, accounting managers, controllers, and chief financial officers.[5] These professionals have a significant impact on businesses through influencing the decision-making process and business strategy.

Management accountants work at various levels of the organization, from the project level to the division level to the controller and chief financial officer. Often, management accountants work where they are needed and not necessarily at corporate headquarters. They tend to be hands-on in the decision-making process. They need many types of information to inform the many decisions they must make.

Table 6.4 Use of Managerial Accounting Information By: Rice University Openstax CC BY NC SA 4.0

Profession	How They Use Managerial Accounting in Their Industry
Engineer	Properly track and report the use of resources involved in an engineering project; measure and communicate costs of a project and its outcomes
Mayor	Put together a budget, a planning and control mechanism that plays an important role in every government
Nurse	Track operating or service costing per patient, or per unit
Mechanic	Use job costing to figure total costs and overall profitability on each job
Retail store manager	Forecast inventory needs, review profit margins, and track sales margins on individual products as well as entire stores
Restaurant owner	Calculate the cost of serving a single table by estimating the cost of the food plus time of server, keep food costs under control through inventory tracking
Architect	Track direct and indirect costs for each job; track profitability per job
Farmer	Calculate yields per field, analyze fertilizer and seeding rates, and control waste

Organizational Structure

Most companies have an organizational chart that displays the configuration and the delegation of authority in the decision-making processes (Figure 6.2). The structure helps define roles and responsibilities. The organizational charts provide guidance to employees and other stakeholders by outlining the official reporting affiliations that direct the workflow within the organization. If the company is particularly efficient, it also will include contact information within the chart. This is a convenient directory to circulate among employees. It helps

them find a particular person in a certain position, or determine whom to speak to about certain areas within the company, or even identify a specific person's supervisor to report positive or negative work behavior.

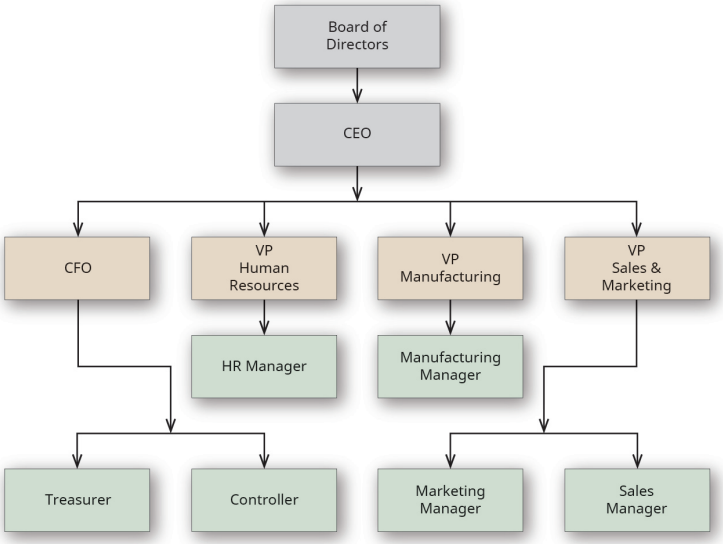


Figure 6.2 Sample Organizational Chart *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Stockholders of a company are the owners; however, they elect a board of directors to manage that company for them. The board selects the officers who will implement the policies and strategic goals that the board has set in place. The chief executive officer (CEO) is the corporation officer who has the overall responsibility for the management of the company. The person overseeing all of the accounting and finance concerns is the chief financial officer (CFO). This individual is in charge of the financial planning and record-keeping of the organization and reports to the CEO. The controller is responsible for the accounting side of the business

(accounting records, financial statements, tax returns, and internal reports) and reports to the CFO. Also reporting to the CFO is the treasurer, who is in control of the finance side of the business (cash position, corporation funds). An additional area that sometimes falls under the control of the CFO is the internal audit staff. Internal auditors supply independent assurance that a company's internal control processes are effective. However, there is strong support for keeping the internal audit staff outside of the CFO, because of a possible conflict of interest.

Careers

The field of managerial accounting, or corporate accounting, is composed of the financial and accounting responsibilities required to operate any type of business. Managerial accountants are employed within organizations to monitor costs, sales, budgets, and spending; conduct audits; predict future requirements; and aid the executive leaders of the organization with financial decision-making.

Figure 6.3 lists approximate salaries for several financial and managerial accounting employment positions. In reviewing the salary information, be aware that there are often major variances in salaries based on geographical locations. For example, a cost accountant manager in San Francisco, California, would typically be paid significantly more than an accountant in a similar position in Fayetteville, Arkansas. However, the cost of living, especially housing costs, in San Francisco is also significantly higher than the cost of living in Fayetteville.



Source: "40 Top Paying Accounting Jobs." *Accounting Degrees Review*. https://www.accounting-degree.org/top-paying-accounting-jobs/

Figure 6.3 Accounting Position Salaries *Salaries are shown for some entry-level and advanced-level jobs available with an accounting degree. Accounting Position Salaries. By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Managerial accountants find employment opportunities in a wide variety of settings and industries. Professionals in this discipline are in high demand from public and private companies, government agencies, and not-for-profit entities (NFPs). Some areas of management accounting are versatile to any sector (corporate, government, or NFP).

- A financial analyst assists in preparing budgets, tracking actual costs, examining task performance, scrutinizing different types of variances, and supporting other management personnel in organizing forecasts and projections.
- A budget analyst arranges and manages the master budget and compares master budget projections to actual results. This individual must be vastly aware of all operations in the budget and work closely with the rest of the accounting staff as well as management personnel.

- An internal auditor typically reports to high-level executives within the company. An internal auditor is often called on to investigate budget variances, industrial sabotage, poor work quality, fraud, and theft. He or she also safeguards the internal controls and confirms they are working and effective.
- A cash-management accountant has responsibilities that include transferring monies between accounts, monitoring deposits and payments, reconciling cash balances, creating and tracking cash forecasts, and performing all other cash-related financial processes.

Other areas of managerial accounting are specific to the sector in which accountants work. For example, the area of cost accounting is more specific to the corporate or manufacturing sector. These cost accountants amass large sums of data, checking for accuracy and then formulating the cost of raw materials, work in process, finished goods, labor, overhead, and other associated manufacturing costs.

Governmental entities also use accounting to communicate with their constituents. Government agencies include all levels of government, federal, state, county, and city, including military, law enforcement, airports, and school systems. Government accountants deal with budgets, auditing, and payroll, the same as all other managerial accountants. However, they must follow a different set of accounting rules called the Governmental Accounting Standards Board (GASB).

Nonprofit (not-for-profit) organizations are tax-exempt organizations that serve their communities in a variety of areas, such as religion, education, social services, health care, and the arts. Managerial accountants in this area are most often focused on budgets. The biggest difference between a corporate budget analyst and a nonprofit budget analyst is that the nonprofit analyst works the budget backward, compared to the corporate analyst. For example, if a

corporation was selling widgets, its budget would start with a sales forecast of how many widgets the company thinks it can sell. This gives the company a forecast of how much it can spend on expenses and fixed assets. The nonprofit budget analysts often start with the expenses. They forecast how much the expenses will be in order to continue to offer their service to the community. From there, they then adjust how much they will need to obtain through fundraising, donations, grants, or other sources to meet their expenses.

YOUR TURN

Career Planning

All companies need to plan ahead in order to continuously move forward. Their top management must take into consideration where they want the company to be in the next three to five years. Just like a company, you also need to consider where you want to be in three to five years, and you need to start taking strides now to accomplish what it is you need to in order to get there (Figure 6.4).



Figure 6.4 Career Planning *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

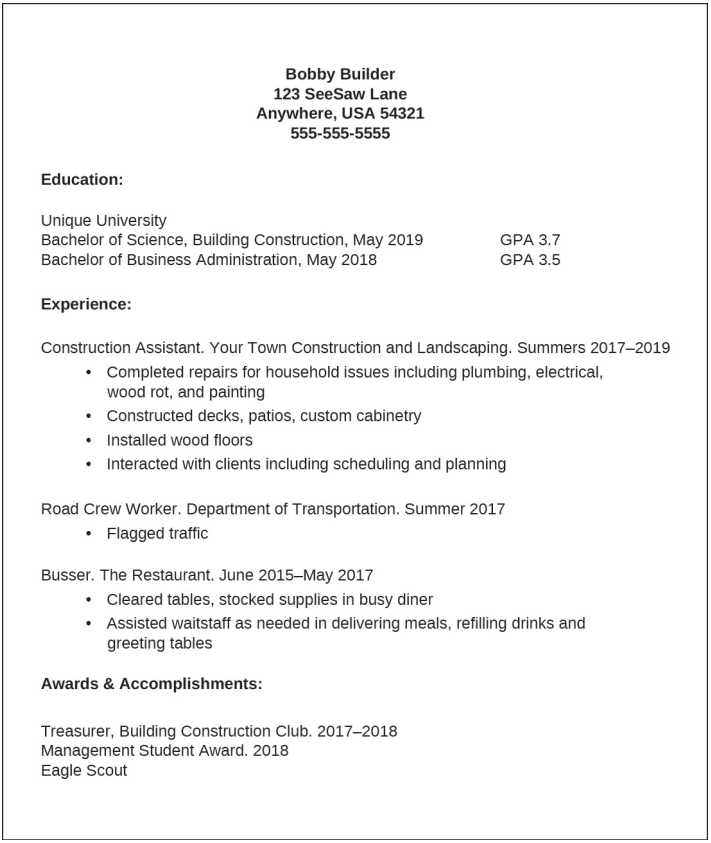
Answer the following:

1. What job would you like to be doing in three to five years? What is your plan for getting there? Identify five to ten steps needed.
2. Do you have a specific company you would like to be working for in the next three to five years? What are the reasons you want to work for them?
3. In order to acquire the position you want, at the company you want, you need a résumé. Your résumé is like the company report of "you." It needs to offer reliable information about your experiences and achievements. What are the basic elements of a résumé, and how will you provide reassurance that the information on your résumé is trustworthy?

Solution

Answers will vary. Sample answer:

1. I would like to own my own home remodeling company. Steps to get there include the following:
    A. complete double major in business and building construction
    B. in the summers before graduation, work for a local handyman franchise
    C. after graduation, work for a home builder as a project manager
    D. while working, save money for five years to be used to start my own company
    E. put together a business plan
    F. start my own business six years after graduation
2. I would like to work for a national home builder such as **Pulte** or **Toll Brothers**. Ideally, I would have an internship with one of them during college. I would like to work for a national builder or a large regional builder because they already have a good business model and I could learn how that works.
3. My résumé needs to contain my education information such as the degree and my majors as well as classes that are pertinent to my career. It should also indicate all of my work experience and any particular skills or certifications I have achieved, such as Eagle Scout. An example of how this information may be presented on a résumé can be seen in Figure 6.5.



Bobby Builder
123 SeeSaw Lane
Anywhere, USA 54321
555-555-5555

Education:

Unique University
Bachelor of Science, Building Construction, May 2019 GPA 3.7
Bachelor of Business Administration, May 2018 GPA 3.5

Experience:

Construction Assistant. Your Town Construction and Landscaping. Summers 2017–2019

- Completed repairs for household issues including plumbing, electrical, wood rot, and painting
- Constructed decks, patios, custom cabinetry
- Installed wood floors
- Interacted with clients including scheduling and planning

Road Crew Worker. Department of Transportation. Summer 2017

- Flagged traffic

Busser. The Restaurant. June 2015–May 2017

- Cleared tables, stocked supplies in busy diner
- Assisted waitstaff as needed in delivering meals, refilling drinks and greeting tables

Awards & Accomplishments:

Treasurer, Building Construction Club. 2017–2018
Management Student Award. 2018
Eagle Scout

Figure 6.5 Sample Résumé *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Certifications

There are many distinct accounting certifications that accountants can earn in order to improve their careers, attain

promotions, and acquire raises in their pay. The certifications are somewhat different from each other and focused toward different career paths. Many accountants have more than one of these credentials to diversify their paths.

The Certified Public Accountant (CPA) is considered the top tier in accounting certifications. Many companies or positions require CPA certification. For example, most employees at accounting firms earn a CPA certificate within the first few of years of graduation. Some positions, such as controller or CFO, often require CPA certification. In the United States, each state has different educational and experience requirements in order to obtain the CPA. The certification requires passing the four-part CPA exam as well. This is administered by the American Institute of Certified Public Accountants (AICPA). There are four parts to the exam: Financial Accounting and Reporting (FAR), Auditing and Attestation (AUD), Regulation (REG), and Business Environment and Concepts (BEC). Each part is graded on a 100-point scale. A score of seventy-five or greater must be achieved in order to pass each section. The exams can be intimidating, as it is a difficult process to go through. As of 2017, the AICPA reported a pass rate of less than 50 percent, which may contribute to its high regard around the world. After passing the CPA exam, candidates must work for one year under the supervision of a licensed CPA before their own license is approved by a state regulatory agency. Those certified in public accounting work in all areas of accounting. However, do not assume that being a CPA is the only way to secure an excellent position in accounting.

The Certified Management Accountant (CMA) is another top-tiered certification for accountants. The CMA title identifies the individual as a specialist in corporate accounting management. The CMA has some overlap with the CPA, but the CPA is focused more on compliance, tax, and controls. CMAs favor financial analytics, budgeting, and strategic assessment. This certification requires the minimum of a

bachelor's degree from an accredited college or university, two years of work experience, and successfully passing both parts of the exam. Part one of the exam covers financial reporting, planning, performance, and controls. Part two focuses on financial decision-making. The exam is administered by the IMA and has a 50 percent passing rate globally.

Not as popular in the United States as the CPA, the Certified Financial Analyst (CFA) certification is more in demand throughout Europe and Asia. This certification prepares accountants for a career in the finance and investment domains. Requirements of this credential include a bachelor's degree or four years' worth of experience, plus passing all three sections of the exam. The exam is administered by the CFA Institute. There are three separate exams, each one taking up to six hours to complete. The exams must be completed in succession. This credential is considered one of the more rigorous ones to obtain, with a passing rate of less than 45 percent.

The Enrolled Agent (EA) credential focuses on a career in taxation, whether it is working in tax preparation for the public, internally for a corporation, or for the government at the Internal Revenue Service (IRS). The EA certification was created by the IRS to signify significant knowledge of the US tax code and the ability to apply the concepts of that code. Enrolled agents have the privilege of being able to sign tax returns as paid preparers, and they are able to represent their clients in front of the IRS. The EA certification can be obtained by passing a three-part exam covering all types of individual and business tax returns. Once the certification is obtained, enrolled agents must follow strict ethical standards and complete 72 hours of continuing education courses every three years.

The Certified Internal Auditor (CIA) is a credential offered by the Institute of Internal Auditors (IIA) and is one of the only certifications that is accepted worldwide. CIAs tend to be

employed in auditing areas within government agencies, banking, finance, or corporations. They examine financial documents to investigate deficiencies in internal controls. Requirements for this certification include a bachelor's degree, two years of work experience in a related field, and passing the three sections of the examination. Also required are providing character references, following a code of ethics, and continuing education.

The Certified Fraud Examiner (CFE) certification signifies proven proficiency in fraud prevention, detection, and deterrence. CFEs are instructed in how to identify the red flags that may indicate fraudulent actions. The designation is awarded by the Association of Certified Fraud Examiners (ACFE) after applicants have met the following requirements: bachelor's degree, two years of work-related experience, moral character references, and the passing of four separate exams.

The Certified Government Auditing Professional (CGAP) designation is exclusively for auditors employed throughout the public sector (federal, state, local) and is offered by the IIA. Requirements for this credential are the same as for the CIA. The exam has 115 multiple-choice questions and covers four areas focusing on proficiency in generally accepted government auditing standards (GAGAS).

These certifications lead to different job responsibilities and different career paths. As indicated, each of the certifications requires varying degrees of education and has exams that are unique to that particular certification. All of these certifications also require a certain number of hours of continuing education in order to keep the certification active. This ensures that the certificate holder is up to date on changes in the field. There are always many opportunities throughout the year to obtain continuing education credits through seminars, webinars, symposiums, and online and in-person classes.

Long Descriptions

A chart outlines workflow for an organization. At the top is the board of directors. Below that is the CEO. The line below that is CFO, VP Human Resources, VP Manufacturing, and VP Sales and Marketing. Below the CFO is Treasurer and Controller. Below VP Human Resources is HR Manager. Below VP Manufacturing is Manufacturing Manager. Below VP Sales and Marketing is Marketing Manager and Sales Manager. Return

A graph shows salaries earned for various accounting positions. Rounded, the graph display shows these earnings: VP of finance earns $133,000, chief financial officer earns $128,000, international tax manager earns $112,000, finance director earns $110,000, corporate controller earns $93,000, cost accountant manager earns $83,000, senior financial analyst earns $78,000, accounting software developer earns $70,000, forensic accountant earns $65,000, FBI accountant earns $59,000, tax accountant earns $55,000, auditor earns $55,000, cost accountant earns $55,000, bookkeeper earns $41,000. Source information: 40 top paying accounting jobs, accounting degrees review. Return

A sample résumé starts with the following information at the top, centered: Bobby Builder; 123 SeeSaw Lane; Anywhere, USA 54321; 555-555-5555. The first section is labeled Education. It lists Unique University; Bachelor of Science, Building Construction, May 2019, GPA 3.7; Bachelor of Business Administration, May 2018, GPA 3.5. The next section is labeled Experience. It lists Construction Assistant. Your Town Construction and Landscaping. Summers 2017 to 2019. Below this line are bullet points: Completed repairs for household issues including plumbing, electrical, wood rot, and painting; Constructed decks, patios, custom cabinetry; Installed wood floors; Interacted with clients including scheduling and planning. Next is Road Crew Worker. Department of Transportation. Summer 2017. Below this line is the bullet Flagged traffic. Next

is Busser. The Restaurant. June 2015 to May 2017. Below this line are the bullets Cleared tables, stocked supplies in busy diner; Assisted wait staff as needed in delivering meals, refilling drinks, and greeting tables. The next section is Awards and Accomplishments. It lists Treasurer, Building Construction Club. 2017 to 2018; Management Student Award. 2018; Eagle Scout. Return

Footnotes

- 4 "Management Accounting Careers." Institute of Management Accountants. https://www.imanet.org/students/management-accounting-careers?ssopc=1
- 5 "Management Accounting Careers." Institute of Management Accountants. https://www.imanet.org/students/management-accounting-careers?ssopc=1

6.3 Merchandising, Manufacturing & Service Organizations

Most businesses can be classified into one or more of these three categories: manufacturing, merchandising, or service. Stated in broad terms, manufacturing firms typically produce a product that is then sold to a merchandising entity (a retailer) For example, **Proctor and Gamble** produces a variety of shampoos that it sells to retailers, such as **Walmart**, **Target**, or **Walgreens**. A service entity provides a service such as accounting or legal services or cable television and internet connections.

Some companies combine aspects of two or all three of these categories within a single business. If it chooses, the same company can both produce and market its products directly to consumers. For example, **Nike** produces products that it directly sells to consumers and products that it sells to retailers. An example of a company that fits all three categories is Apple, which produces phones, sells them directly to consumers, and also provides services, such as extended warranties.

Regardless of whether a business is a manufacturer of products, a retailer selling to the customer, a service provider, or some combination , all businesses set goals and have strategic plans that guide their operations. Strategic plans look very different from one company to another. For example, a retailer such as Walmart may have a strategic plan that focuses on increasing same store sales. **Facebook's** strategic plan may focus on increasing subscribers and attracting new advertisers. An accounting firm may have long-term goals to open offices in neighboring cities in order to serve more clients. Although

the goals differ, the process all companies use to achieve their goals is the same. First, they must develop a plan for how they will achieve the goal, and then management will gather, analyze, and use information regarding costs to make decisions, implement plans, and achieve goals.

Table 6.5 lists examples of these costs. Some of these are similar across different types of businesses; others are unique to a particular business.

Table 6.5 Costs. Some costs, such as raw materials, are unique to a particular type of business. Other costs, such as billing and collections, are common to most businesses, regardless of the type. By: Rice University Openstax CC BY NC SA 4.0

Type of Business	Costs Incurred
Manufacturing Business	• Direct labor • Plant and equipment • Manufacturing overhead • Raw materials
Merchandising Business	• Lease on retail space • Merchandise inventory • Retail sales staff
Service Business	• Billing and collections • Computer network equipment • Professional staff

Knowing the basic characteristics of each cost category is important to understanding how businesses measure, classify, and control costs.

Merchandising Organizations

A merchandising firm is one of the most common types of businesses. A merchandising firm is a business that purchases finished products and resells them to consumers. Consider your local grocery store or retail clothing store. Both of these are merchandising firms. Often, merchandising firms are referred to as *resellers* or *retailers* since they are in the business of reselling a product to the consumer at a profit.

Think about purchasing toothpaste from your local drug store. The drug store purchases tens of thousands of tubes of toothpaste from a wholesale distributor or manufacturer in order to get a better per-tube cost. Then, they add their mark-up (or profit margin) to the toothpaste and offer it for sale to you. The drug store did not manufacture the toothpaste; instead, they are reselling a toothpaste that they purchased. Virtually all of your daily purchases are made from merchandising firms such as **Walmart**, **Target**, **Macy's**, **Walgreens**, and **AutoZone**.

Merchandising firms account for their costs in a different way from other types of business organizations. To understand merchandising costs, Figure 6.6 shows a simplified income statement for a merchandising firm:

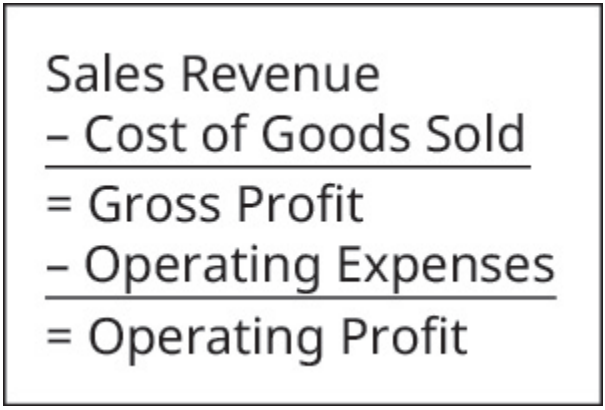


Figure 6.6 Simplified Income Statement for a Merchandising Firm *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

This simplified income statement demonstrates how merchandising firms account for their sales cycle or process. *Sales revenue* is the income generated from the sale of finished goods to consumers rather than from the manufacture of goods or provision of services. Since a merchandising firm has to purchase goods for resale, they account for this cost as *cost of goods sold*—what it cost them to acquire the goods that are then sold to the customer. The difference between what the drug store paid for the toothpaste and the revenue generated by selling the toothpaste to consumers is their *gross profit*. However, in order to generate sales revenue, merchandising firms incur expenses related to the process of operating their business and selling the merchandise. These costs are called *operating expenses*, and the business must deduct them from the gross profit to determine the *operating profit*. (Note that while the terms "operating profit" and "operating income" are often used interchangeably, in real-world interactions you should confirm exactly what the user means in using those terms.) Operating

expenses incurred by a merchandising firm include insurance, marketing, administrative salaries, and rent.



Figure 6.7 Stairs Shopping Mall *Shopping Mall. Merchandising firms must identify and manage their costs to remain competitive and attract customers to their business. Stairs Shopping Mall. By: jarmoluk Source: Pixabay CC0*

CONCEPTS IN PRACTICE

Balancing Revenue and Expenses

Plum Crazy is a small boutique selling the latest in fashion trends. They purchase clothing and fashion accessories from several distributors and manufacturers for resale. In 2017, they reported these revenue and expenses:

Rent	$12,000	Sales revenue	$150,000
Advertising	4,000	Cost of goods sold	60,000
Utilities	1,500	Supplies	3,000
Salaries and wages	35,000	Miscellaneous	1,200

Figure 6.8 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Before examining the income statement, let's look at Cost of Goods Sold in more detail. Merchandising companies have to account for inventory, a topic covered in Inventory. As you recall, merchandising companies carry inventory from one period to another. When they prepare their income statement, a crucial step is identifying the actual cost of goods that were sold for the period. For Plum Crazy, their Cost of Goods Sold was calculated as shown in Figure 6.9.

PLUM CRAZY Cost of Goods Sold For the Year Ended December 31, 2017	
Beginning Merchandise Inventory	$ 23,500
+ Purchases	115,000
Goods Available for Sale	138,500
– Ending Merchandise Inventory	(78,500)
Cost of Goods Sold	$ 60,000

Figure 6.9 Plum Crazy's Cost of Goods Sold Statement *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Once the calculation of the Cost of Goods Sold has been completed, Plum Crazy can now construct their income statement, which would appear as shown in Figure 6.10.

PLUM CRAZY Income Statement For the Year Ended December 31, 2017		
Sales Revenue		$150,000
Cost of Goods Sold		60,000
Gross Profit		90,000
Advertising	$ 4,000	
Rent	12,000	
Salaries and Wages	35,000	
Supplies	3,000	
Utilities	1,500	
Miscellaneous	1,200	
Operating Expenses	56,700	56,700
Net Income		$ 33,300

Since merchandising firms must pass the cost of goods on to the consumer to earn a profit, they are extremely cost sensitive. Large merchandising businesses like Walmart, Target, and **Best Buy** manage costs by buying in bulk and negotiating with manufacturers and suppliers to drive the per-unit cost.

Manufacturing Organizations

A manufacturing organization is a business that uses parts, components, or raw materials to produce finished goods (Figure 6.11). These finished goods are sold either directly to the consumer or to other manufacturing firms that use them as a component part to produce a finished product. For example, **Diehard** manufactures automobile batteries that are sold directly to consumers by retail outlets such as AutoZone, **Costco**, and **Advance Auto**. However, these batteries are also sold to automobile manufacturers such as **Ford**, **Chevrolet**, or **Toyota** to be installed in cars during the manufacturing process. Regardless of who the final consumer of the final product is, Diehard must control its costs so that

the sale of batteries generates revenue sufficient to keep the organization profitable.



Figure 6.11 Work Manufactures *Manufacturing firms apply direct labor to raw materials in order to produce the finished goods purchased from retailers. Work Manufactures. By: dodaning0 Source: Pixabay CC0*

Manufacturing firms are more complex organizations than merchandising firms and therefore have a larger variety of costs to control. For example, a merchandising firm may purchase furniture to sell to consumers, whereas a manufacturing firm must acquire raw materials such as lumber, paint, hardware, glue, and varnish that they transform into furniture. The manufacturer incurs additional costs, such as direct labor, to convert the raw materials into furniture. Operating a physical plant where the production process takes place also generates costs. Some of these costs are tied directly to production, while others are general expenses necessary to operate the business. Because the manufacturing process can be highly complex, manufacturing firms constantly evaluate their production processes to determine where cost savings are possible.

CONCEPTS IN PRACTICE

Cost Control

Controlling costs is an integral function of all managers, but companies often hire personnel to specifically oversee cost control. As you've learned, controlling costs is vital in all industries, but at **Hilton Hotels**, they translate this into the position of Cost Controller. Here is an excerpt from one of Hilton's recent job postings.

Position Title: Cost Controller

Job Description: "A Cost Controller will work with all Heads of Departments to effectively control all products that enter and exit the hotel."[6]

Job Requirements:

"As Cost Controller, you will work with all Heads of

Departments to effectively control all products that enter and exit the hotel. Specifically, you will be responsible for performing the following tasks to the highest standards:

- Review the daily intake of products into the hotel and ensure accurate pricing and quantity of goods received
- Control the stores by ensuring accuracy of inventory and stock control and the pricing of goods received
- Alert relevant parties of slow-moving goods and goods nearing expiry dates to reduce waste and alter product purchasing to accommodate
- Manage cost reporting on a weekly basis
- Attend finance meetings, as required
- Maintain good communication and working relationships with all hotel areas
- Act in accordance with fire, health and safety regulations and follow the correct procedures when required"[7]

As you can see, the individual in this position will interact with others across the organization to find ways to control costs for the benefit of the company. Some of the benefits of cost control include:

- Lowering overall company expenses, thereby increasing net income.
- Freeing up financial resources for investment in research & development of new or improved products, goods, or services
- Providing funding for employee development and training, benefits, and bonuses
- Allowing corporate earnings to be used to support humanitarian and charitable causes

Manufacturing organizations account for costs in a way that

is similar to that of merchandising firms. However, as you will learn, there is a significant difference in the calculation of cost of goods sold. Figure 6.12 shows a simplification of the income statement for a manufacturing firm:

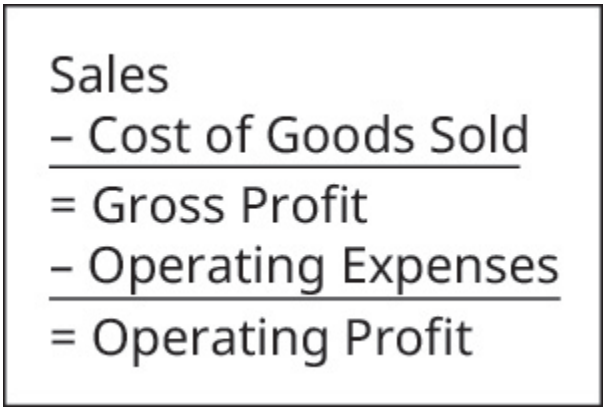


Figure 6.12 Simplified Income Statement for a Manufacturing Firm *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

At first it appears that there is no difference between the income statements of the merchandising firm and the manufacturing firm. However, the difference is in how these two types of firms account for the cost of goods sold. Merchandising firms determine their cost of goods sold by accounting for both existing inventory and new purchases, as shown in the Plum Crazy example. It is typically easy for merchandising firms to calculate their costs because they know exactly what they paid for their merchandise.

Unlike merchandising firms, manufacturing firms must calculate their cost of goods sold based on how much they manufacture and how much it costs them to manufacture those goods. This requires manufacturing firms to prepare an additional statement before they can prepare their income statement. This additional statement is the *Cost of Goods*

Manufactured statement. Once the cost of goods manufactured is calculated, the cost is then incorporated into the manufacturing firm's income statement to calculate its cost of goods sold.

One thing manufacturing firms must consider in their cost of goods manufactured is that, at any given time, they have products at varying levels of production: some are finished and others are still process. The cost of goods manufactured statement measures the cost of the goods actually finished during the period, whether or not they were started during that period.

Before examining the typical manufacturing firm's process to track cost of goods manufactured, you need basic definitions of three terms in the schedule of Costs of Goods Manufactured: direct materials, direct labor, and manufacturing overhead. Direct materials are the components used in the production process whose costs can be identified on a per item-produced basis. For example, if you are producing cars, the engine would be a direct material item. The direct material cost would be the cost of one engine. Direct labor represents production labor costs that can be identified on a per item-produced basis. Referring to the car production example, assume that the engines are placed in the car by individuals rather than by an automated process. The direct labor cost would be the amount of labor in hours multiplied by the hourly labor cost. Manufacturing overhead generally includes those costs incurred in the production process that are not economically feasible to measure as direct material or direct labor costs. Examples include the department manager's salary, the production factory's utilities, or glue used to attach rubber molding in the auto production process. Since there are so many possible costs that can be classified as manufacturing overhead, they tend to be grouped and then allocated in a predetermined manner to the production process.

Figure 6.13 is an example of the calculation of the Cost of Goods Manufactured for Koeller Manufacturing. It demonstrates the relationship between cost of goods manufactured and cost of goods in progress and includes the three main types of manufacturing costs.

KOELLER MANUFACTURING Schedule of Cost of Goods Manufactured For the Month Ended March 31, 2017		
Work in Process Inventory (beginning balance)		$ 75,000
Current Manufacturing Costs:		
Direct Material	$15,000	
Direct Labor	25,000	
Manufacturing Overhead	23,000	
Total Manufacturing Costs		63,000
Total Cost of Work in Process		138,000
– Work in Process, ending balance		43,000
Cost of Goods Manufactured		$ 95,000

Figure 6.13 Koeller Manufacturing's Cost of Goods Manufactured *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

As you can see, the manufacturing firm takes into account its work-in-process (WIP) inventory as well as the costs incurred during the current period to finish not only the units that were in the beginning WIP inventory, but also a portion of any production that was started but not finished during the month. Notice that the current manufacturing costs, or the additional costs incurred during the month, include direct materials, direct labor, and manufacturing overhead. Direct materials are calculated as

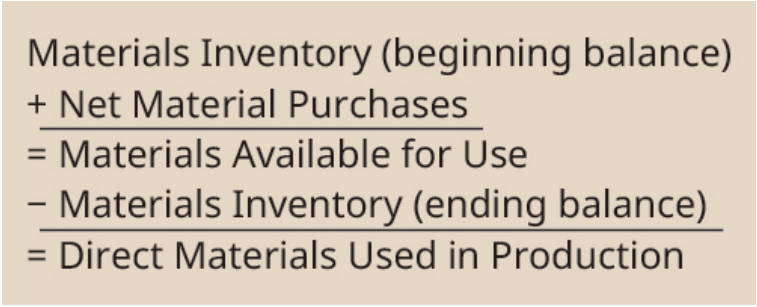


Figure 6.14 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

All of these costs are carefully tracked and classified because the cost of manufacturing is a vital component of the schedule of cost of goods sold. To continue with the example, Koeller Manufacturing calculated that the cost of goods sold was $95,000, which is carried through to the Schedule of Cost of Goods Sold (Figure 6.15).

KOELLER MANUFACTURING Schedule of Cost of Goods Sold For the Month Ended March 31, 2017	
Beginning Finished Goods Inventory	$ 65,000
+ Cost of Goods Manufactured	95,000
Goods Available for Sale	160,000
– Ending Finished Goods Inventory	58,000
Cost of Goods Sold	$102,000

Figure 6.15 Koeller Manufacturing's Cost of Goods Sold *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Now when Koeller Manufacturing prepares its income statement, the simplified statement will appear as shown in Figure 6.16.

KOELLER MANUFACTURING Income Statement For the Month Ended March 31, 2017	
Sales	$214,000
– Cost of Goods Sold	102,000
Gross Profit	112,000
– Operating Expenses	80,000
Operating Income	$ 32,000

Figure 6.16 Koeller Manufacturing's Income Statement *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

So, even though the income statements for the merchandising firm and the manufacturing firm appear very similar at first glance, there are many more costs to be captured by the manufacturing firm. Figure 6.17 compares and contrasts the methods merchandising and manufacturing firms use to calculate the cost of goods sold in their income statement.

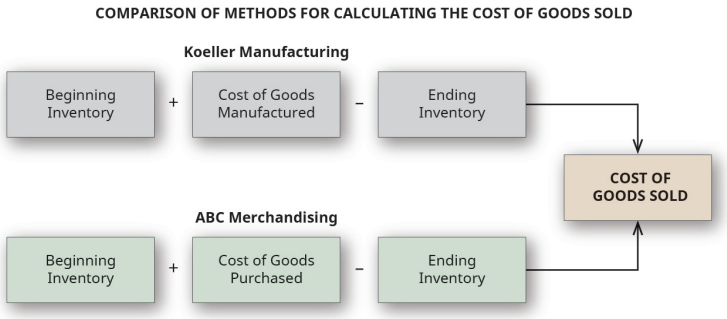


Figure 6.17 Comparison Methods for Calculating the Cost of Goods Sold *Merchandising firms consider the cost of goods purchased, and manufacturing firms consider the cost of goods manufactured in order to determine the cost of goods sold. Comparison Methods for Calculating the Cost of Goods Sold. By: Rice University Source: Openstax CC BY-NC-SA 4.0*

CONCEPTS IN PRACTICE

Calculating Cost of Goods Sold in Manufacturing

Just Desserts is a bakery that produces and sells cakes and pies to grocery stores for resale. Although they are a small manufacturer, they incur many of the costs of a much larger organization. In 2017, they reported these revenue and expenses:

Office rent	$20,000	Sales revenue	$150,000
Office utilities	1,500	Cost of goods sold	70,000
Administrative salaries	35,000	Administrative expenses	12,000

Figure 6.18 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Their income statement is shown in Figure 6.19.

JUST DESSERTS Income Statement For the Year Ended December 31, 2017		
Sales Revenue		$150,000
Cost of Goods Sold		70,000
Gross Profit		80,000
Administrative Expenses	$12,000	
Administrative Salaries	35,000	
Office Utilities	1,500	
Office Rent	20,000	
Operating Expenses		68,500
Net Income		$ 11,500

Figure 6.19 Just Desserts' Income Statement *By: Rice University*
Source: Openstax CC BY-NC-SA 4.0 Long Description

Service Organizations

A service organization is a business that earns revenue by providing intangible products, those that have no physical substance. The service industry is a vital sector of the U.S. economy, providing 65% of the U.S. private-sector gross domestic product and more than 79% of U.S. private-sector jobs.[8] If tangible products, physical goods that customers can handle and see, are provided by a service organization, they are considered ancillary sources of revenue. Large service organizations such as airlines, insurance companies, and hospitals incur a variety of costs in the provision of their services. Costs such as labor, supplies, equipment, advertising,

and facility maintenance can quickly spiral out of control if management is not careful. Therefore, although their cost drivers are sometimes not as complex as those of other types of firms, cost identification and control are every bit as important in the service industry.

For example, consider the services that a law firm provides its clients. What clients pay for are services such as representation in legal proceedings, contract negotiations, and preparation of wills. Although the true value of these services is not contained in their physical form, they are of value to the client and the source of revenue to the firm. The managing partners in the firm must be as cost conscious as their counterparts in merchandising and manufacturing firms. Accounting for costs in service firms differs from merchandising and manufacturing firms in that they do not purchase or produce goods. For example, consider a medical practice. Although some services provided are tangible products, such as medications or medical devices, the primary benefits the physicians provide their patients are the intangible services that are comprised of his or her knowledge, experience, and expertise.

Service providers have some costs (or revenue) derived from tangible goods that must be taken into account when pricing their services, but their largest cost categories are more likely to be administrative and personnel costs rather than product costs.

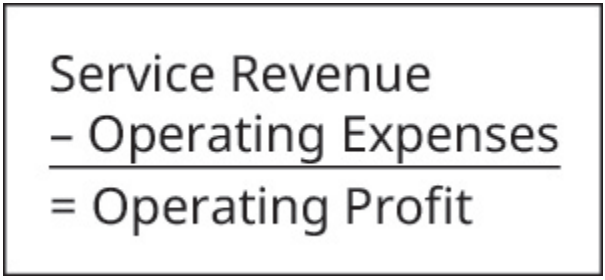


Figure 6.20 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

For example, Whichard & Klein, LLP, is a full-service accounting firm with their primary offices in Baltimore, Maryland. With two senior partners and a small staff of accountants and payroll specialists, the majority of the costs they incur are related to personnel. The value of the accounting and payroll services they provide to their clients is intangible in comparison to goods sold by a merchandiser or produced by a manufacturer but has value and is the primary source of revenue for the firm. At the end of 2019, Whichard and Klein reported the following revenue and expenses:

Revenue from services provided	$412,000	Utilities	$11,000
Accounting personnel salaries	210,000	Miscellaneous expenses	7,500
Office expense	35,000	Administrative salaries	45,000
Office equipment	9,000		

Figure 6.21 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Their Income Statement for the period is shown in Figure 6.22.

WHICHARD & KLEIN, LLP
Income Statement
For the Year Ended December 31, 2019

Service Revenue	$412,000
Operating Expenses	
Salaries	210,000
Office Expense	35,000
Office Equipment	9,000
Administrative Salaries	45,000
Utilities	11,000
Miscellaneous	7,500
Total Operating Expenses	317,500
Operating Income	$ 94,500

Figure 6.22 Whichard & Klein's Income Statement *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

The bulk of the expenses incurred by Whichard & Klein are in personnel and administrative/office costs, which are very common among businesses that have services as their primary source of revenue.

CONCEPTS IN PRACTICE

Revenue and Expenses for a Law Office

The revenue and expenses for a law firm illustrate how the income statement for a service firm differs from that of a merchandising or manufacturing firm.

Welch & Graham is a well-established law firm that provides legal services in the areas of criminal law, real estate transactions, and personal injury. The firm employs several attorneys, paralegals, and office support staff. In 2017, they reported the following revenue and expenses:

Office rent	$ 20,000	Paralegal salaries	$ 100,000
Office utilities	12,500	Service revenue	1,500,000
Administrative salaries	150,000	Office expenses	12,000
Attorneys' salaries	750,000		

Figure 6.23 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Their income statement is shown in Figure 6.24.

WELCH & GRAHAM, ATTORNEYS AT LAW Income Statement For the Year Ended December 31, 2017		
Service Revenue		$1,500,000
Operating Expenses		
Administrative Salaries	$ 150,000	
Attorney Salaries	750,000	
Office Expenses	12,000	
Office Rent	20,000	
Paralegal Salaries	100,000	
Office Utilities Expenses	12,500	
Total Operating Expenses		1,044,500
Net Income		$ 455,500

Figure 6.24 Welch & Graham's Income Statement By: Rice University Source: Openstax CC BY-NC-SA 4.0Long Description

As you can see, the majority of the costs incurred by the law firm are personnel related. They may also incur costs from equipment and materials such computer networks, phone and switchboard equipment, rent, insurance, and law library materials necessary to support the practice, but these costs represent a much smaller percentage of total cost than the administrative and personnel costs.

Long Descriptions

Plum Crazy Income Statement for the Year Ended December 31, 2017. Sales Revenue $150,000, plus Cost of Goods Sold $60,000 equals Gross Profit $90,000. Advertising $4,000, plus Rent $12,000, plus Salaries and Wages $35,000, plus Supplies $3,000, plus Utilities $1,500, plus Miscellaneous $1,200, equals Operating Expenses $56,700. Gross Profit $90,000 less Operating Expenses $56,700 equals Net Income $33,300." Return

Koeller Manufacturing Schedule of Cost of Goods Manufactured For the Month Ended March 31, 2017. Work in Process Inventory (beginning balance) $75,000, plus Current Manufacturing Costs: Direct Material $15,000, Direct Labor 25,000, and Manufacturing Overhead 23,000, equals Total Manufacturing Costs of 63,000. Equals Total cost of Work in Process 138,000, less Work in Process, ending balances 43,000, equals Cost of Goods Manufactured $95,000. Return

Just Desserts Income Statement For the Year Ended December 31, 2017. Sales Revenue $150,000, plus Cost of Goods Sold 70,000, equals Gross Profit 80,000. Administrative Expenses $12,000, plus Administrative Salaries 35,000, plus Office Utilities 1,500, plus Office Rent 20,000, equals Operating Expenses 68,500. Gross profit less Operating Expenses equals $11,500. Return

Wichard & Klein, LLP, Income Statement, For the Year Ending December 31, 2019. Service Revenue $412,000, Less Operating Expenses: Salaries 210,000, Administrative Salaries 45,000, Office Expense 35,000, Utilities 11,000, Office Equipment 9,000, Miscellaneous 7,500 equals Total Operating Expenses $317.500. Equals Operating Income $94,500. Return

Welch & Graham, Attorneys At Law, Income Statement, For the Year Ended December 31, 2017. Service Revenue $1,500,000, Less Operating Expenses: Attorney Salaries 750,000, Administrative Salaries 150,000, Paralegal Salaries 100,000, Office Rent 20,000, Office Utilities 12,500, Office Expenses 12,000, equals Total Operating Expenses $1,044.500. Equals Operating Income $455,500. Return

Footnotes

- 6 Hilton. “Cost Controller: Job Description.” Hosco. https://www.hosco.com/en/job/hilton-istanbul-bomonti-hotel-conference-center/cost-controller

- 7 Hilton. “Cost Controller: Job Description.” Hosco. https://www.hosco.com/en/job/hilton-istanbul-bomonti-hotel-conference-center/cost-controller
- 8 John Ward. “The Services Sector: How Best to Measure It?” International Trade Administration. Oct. 2010. https://2016.trade.gov/publications/ita-newsletter/1010/services-sector-how-best-to-measure-it.asp. “United States GDP from Private Services Producing Industries.” Trading Economics / U.S. Bureau of Economic Analysis. July 2018. https://tradingeconomics.com/united-states/gdp-from-services. “Employment in Services (% of Total Employment) (Modeled ILO Estimate).” International Labour Organization, ILOSTAT database. The World Bank. Sept. 2018. https://data.worldbank.org/indicator/SL.SRV.EMPL.ZS.

6.4 Cost Behavior

Now that we have identified the three key types of businesses, let's identify cost behaviors and apply them to the business environment. In managerial accounting, different companies use the term *cost* in different ways depending on how they will use the cost information. Different decisions require different costs classified in different ways. For instance, a manager may need cost information to plan for the coming year or to make decisions about expanding or discontinuing a product or service. In practice, the classification of costs changes as the use of the cost data changes. In fact, a single cost, such as rent, may be classified by one company as a fixed cost, by another company as a committed cost, and by even another company as a period cost. Understanding different cost classifications and how certain costs can be used in different ways is critical to managerial accounting.

Any discussion of costs begins with the understanding that most costs will be classified in one of three ways: fixed costs, variable costs, or mixed costs. The costs that don't fall into one of these three categories are hybrid costs, which are examined only briefly because they are addressed in more advanced accounting courses. Because fixed and variable costs are the foundation of all other cost classifications, understanding whether a cost is a fixed cost or a variable cost is very important.

Fixed versus Variable Costs

A fixed cost is an unavoidable operating expense that does not change in total over the short term, even if a business

experiences variation in its level of activity. Table 6.6 illustrates the types of fixed costs for merchandising, service, and manufacturing organizations.

Table 6.6 Examples of Fixed Costs By: Rice University Openstax CC BY-NC-SA 4.0

Type of Business	Fixed Cost
Merchandising	Rent, insurance, managers' salaries
Manufacturing	Property taxes, insurance, equipment leases
Service	Rent, straight-line depreciation, administrative salaries, and insurance

We have established that fixed costs do not change in total as the level of activity changes, but what about fixed costs on a *per-unit* basis? Let's examine Tony's screen-printing company to illustrate how costs can remain fixed in total but change on a per-unit basis.

Tony operates a screen-printing company, specializing in custom T-shirts. One of his fixed costs is his monthly rent of $1,000. Regardless of whether he produces and sells any T-shirts, he is obligated under his lease to pay $1,000 per month. However, he can consider this fixed cost on a per-unit basis, as shown in Figure 6.25.

Monthly Rent	Number of T-Shirts Manufactured	Average Rent Cost per T-Shirt
$1,000	200	$5.00
1,000	400	2.50
1,000	600	1.67

Figure 6.25 Individual Rent Cost per T-Shirt Produced *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Tony's information illustrates that, despite the unchanging fixed cost of rent, as the level of activity increases, the per-unit fixed cost falls. In other words, fixed costs remain fixed in total but can increase or decrease on a per-unit basis.

Two specialized types of fixed costs are committed fixed costs and discretionary fixed costs. These classifications are generally used for long-range planning purposes and are covered in upper-level managerial accounting courses, so they are only briefly described here.

Committed fixed costs are fixed costs that typically cannot be eliminated if the company is going to continue to function. An example would be the lease of factory equipment for a production company.

Discretionary fixed costs generally are fixed costs that can be incurred during some periods and postponed during other periods but which cannot normally be eliminated permanently. Examples could include advertising campaigns and employee training. Both of these costs could potentially be postponed temporarily, but the company would probably incur negative effects if the costs were permanently eliminated. These classifications are generally used for long-range planning purposes.

In addition to understanding fixed costs, it is critical to understand variable costs, the second fundamental cost classification. A variable cost is one that varies in direct proportion to the level of activity within the business. Typical costs that are classified as variable costs are the cost of raw materials used to produce a product, labor applied directly to the production of the product, and overhead expenses that change based upon activity. For each variable cost, there is some activity that drives the variable cost up or down. A cost driver is defined as any activity that causes the organization to incur a variable cost. Examples of cost drivers are direct labor hours, machine hours, units produced, and units sold. Table

6.7 provides examples of variable costs and their associated cost drivers.

Table 6.7 Variable Costs and Associated Cost Drivers By: Rice University Openstax CC BY-NC-SA 4.0

–	Variable Cost	Cost Driver
Merchandising	Total monthly hourly wages for sales staff	Hours business is open during month
Manufacturing	Direct materials used to produce one unit of product	Number of units produced
Service	Cost of laundering linens and towels	Number of hotel rooms occupied

Unlike fixed costs that remain fixed in total but change on a per-unit basis, variable costs remain the same per unit, but change in total relative to the level of activity in the business. Revisiting Tony's T-Shirts, Figure 6.26 shows how the variable cost of ink behaves as the level of activity changes.

Cost of Ink per T-Shirt	Number of T-Shirts Produced	Total Variable Cost of Ink
$0.15	2,000	$300
0.15	4,000	600
0.15	6,000	900

Figure 6.26 Variable Costs per Unit *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

As Figure 6.26 shows, the variable cost per unit (per T-shirt) does not change as the number of T-shirts produced increases or decreases. However, the variable costs change in total as the number of units produced increases or decreases. In short, total variable costs rise and fall as the level of activity (the cost driver) rises and falls.

Distinguishing between fixed and variable costs is critical because the total cost is the sum of all fixed costs (the total fixed costs) and all variable costs (the total variable costs). For every unit produced, every customer served, or every hotel room rented, for example, managers can determine their total costs both per unit of activity and in total by combining their fixed and variable costs together. The graphic in Figure 6.27 illustrates the concept of total costs.

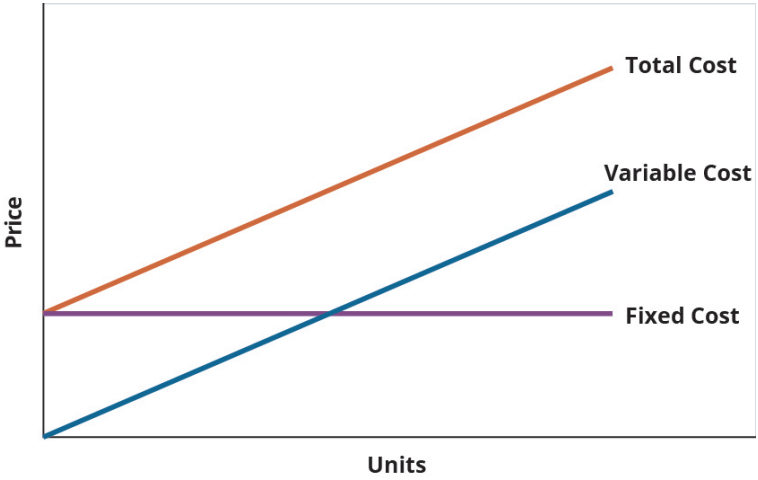


Figure 6.27 Total Cost as the Sum of Total Fixed Costs and Total Variable Costs *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Remember that the reason that organizations take the time and effort to classify costs as either fixed or variable is to be able to control costs. When they classify costs properly, managers can use cost data to make decisions and plan for the future of the business.

CONCEPTS IN PRACTICE

Boeing[9]

If you've ever flown on an airplane, there's a good chance you know Boeing. The Boeing Company generates around $90 billion each year from selling thousands of airplanes to commercial and military customers around the world. It employs around 200,000 people, and it's indirectly responsible for more than a million jobs through its suppliers, contractors, regulators, and others. Its main assembly line in Everett, WA, is housed in the largest building in the world, a colossal facility that covers nearly a half-trillion cubic feet. Boeing is, simply put, a massive enterprise.

And yet, Boeing's managers know the exact cost of everything the company uses to produce its airplanes: every propeller, flap, seat belt, welder, computer programmer, and so forth. Moreover, they know how those costs would change if they produced more airplanes or fewer. They also know the price at which they sold each plane and the profit the company made on each sale. Boeing's executives expect their managers to know this information, in real time, if the company is to remain profitable.

Table 6.8 Examples of Fixed Costs By: Rice University Openstax CC BY-NC-SA 4.0

Decision	Cost Information
Discontinue a product line	Variable costs, overhead directly tied to product, potential reduction in fixed costs
Add second production shift	Labor costs, cost of fringe benefits, potential overhead increases (utilities, security personnel)
Open additional retail outlets	Fixed costs, variable operating costs, potential increases in administrative expenses at corporate headquarters

Average Fixed Costs versus Average Variable Costs

Another way management may want to consider their costs is as average costs. Under this approach, managers can calculate both average fixed and average variable costs. Average fixed cost (AFC) is the total fixed costs divided by the total number of units produced, which results in a per-unit cost. The formula is:

$$\text{Average Fixed Cost (AFC)} = \frac{\text{Total Fixed Costs}}{\text{Total Number of Units Produced}}$$

Figure 6.28 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

To show how a company would use AFC to make business decisions, consider Carolina Yachts, a company that manufactures sportfishing boats that are sold to consumers through a network of marinas and boat dealerships. Carolina Yachts produces 625 boats per year, and their total annual fixed costs are $1,560,000. If they want to determine an average fixed cost per unit, they will find it using the formula for AFC:

When they produce 625 boats, Carolina Yachts has an AFC of $2,496 per boat. What happens to the AFC if they increase or decrease the number of boats produced? Figure 6.29 shows the AFC for different numbers of boats.

Number of Boats Produced	Total Fixed Costs	Average Fixed Cost (per boat)
500	$1,560,000	$3,120
625	1,560,000	2,496
700	1,560,000	2,229

Figure 6.29 Average Fixed Costs for Carolina Yachts *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

We see that total fixed costs remain unchanged, but the average fixed cost per unit goes up and down with the number of boats produced. As more units are produced, the fixed costs are spread out over more units, making the fixed cost per unit fall. Likewise, as fewer boats are manufactured, the average fixed costs per unit rises. We can use a similar approach with variable costs.

Average variable cost (AVC) is the total variable costs divided by the total number of units produced, which results in a per-unit cost. Like ATC, we can use this formula:

$$\text{Average Variable Cost (AVC)} = \frac{\text{Total Variable Costs}}{\text{Total Number of Units Produced}}$$

Figure 6.30 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

To demonstrate AVC, let's return to Carolina Yachts, which incurs total variable costs of $6,875,000 when they produce 625

boats per year. They can express this as an average variable cost per unit:

Because average variable costs are the average of all costs that change with production levels on a per-unit basis and include both direct materials and direct labor, managers often use AVC to determine if production should continue or not in the short run. As long as the price Carolina Yachts receives for their boats is greater than the per-unit AVC, they know that they are not only covering the variable cost of production, but each boat is making a contribution toward covering fixed costs. If, at any point, the average variable cost per boat rises to the point that the price no longer covers the AVC, Carolina Yachts may consider halting production until the variable costs fall again.

These changes in variable costs per unit could be caused by circumstances beyond their control, such as a shortage of raw materials or an increase in shipping costs due to high gas prices. In any case, average variable cost can be useful for managers to get a big picture look at their variable costs per unit.

Here's a brief video recap based on Econ 102 (Principles of Microeconomics)



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=323#oembed-1

Mixed Costs and Stepped Costs

Not all costs can be classified as purely fixed or purely variable. Mixed costs are those that have both a fixed and variable component. It is important, however, to be able to separate mixed costs into their fixed and variable components because, typically, in the short run, we can only change variable costs but not most fixed costs. To examine how these mixed costs actually work, consider the Ocean Breeze hotel.

The Ocean Breeze is located in a resort area where the county assesses an occupancy tax that has both a fixed and a variable component. Ocean Breeze pays $2,000 per month, regardless of the number of rooms rented. Even if it does not rent a single room during the month, Ocean Breeze still must remit this tax to the county. The hotel treats this $2,000 as a fixed cost. However, for every night that a room is rented, Ocean Breeze must remit an additional tax amount of $5.00 per room per night. As a result, the occupancy tax is a mixed cost. Figure 6.31 further illustrates how this mixed cost behaves.

Number of Rooms Rented per Month (Cost Driver)	Fixed Cost Component ($2,000 per month)	Variable Cost Component ($5 per room)	Total Cost (Fixed + Variable)
0	$2,000	$ 0	$2,000
60	2,000	300	2,300
85	2,000	425	2,425
100	2,000	500	2,500

Figure 6.31 Mixed Costs Example for Ocean Breeze *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Notice that Ocean Breeze cannot control the fixed portion of this cost and that it remains fixed in total, regardless of the activity level. On the other hand, the variable component is fixed per unit, but changes in total based upon the level of activity. The fixed portion of this cost plus the variable portion

of this cost combine to make the total cost. As a result, the formula for total cost looks like this:

$$Y = a + bx$$

Figure 6.32 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

where Y is the total mixed cost, a is the fixed cost, b is the variable cost per unit, and x is the level of activity.

Graphically, mixed costs can be explained as shown in Figure 6.33.

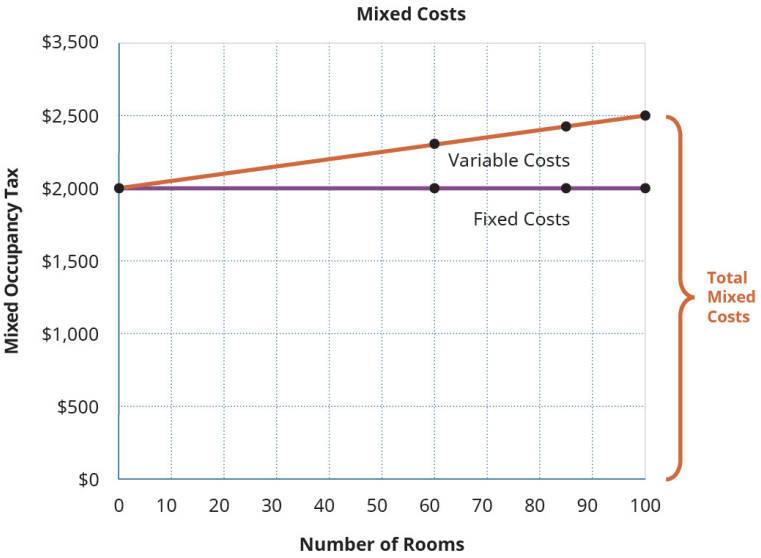


Figure 6.33 Ocean Breeze's Mixed Cost Graph *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

The graph shows that mixed costs are typically both fixed and

linear in nature. In other words, they will often have an initial cost, in Ocean Breeze's case, the $2,000 fixed component of the occupancy tax, and a variable component, the $5 per night occupancy tax. Note that the Ocean Breeze mixed cost graph starts at an initial $2,000 for the fixed component and then increases by $5 for each night their rooms are occupied.

Some costs behave less linearly. A cost that changes with the level of activity but is not linear is classified as a stepped cost. Step costs remain constant at a fixed amount over a range of activity. The range over which these costs remain unchanged (fixed) is referred to as the relevant range, which is defined as a specific activity level that is bounded by a minimum and maximum amount. Within this relevant range, managers can predict revenue or cost levels. Then, at certain points, the step costs increase to a higher amount. Both fixed and variable costs can take on this stair-step behavior. For instance, wages often act as a stepped variable cost when employees are paid a flat salary and a commission or when the company pays overtime. Further, when additional machinery or equipment is placed into service, businesses will see their fixed costs stepped up. The "trigger" for a cost to step up is the relevant range. Graphically, step costs appear like stair steps (Figure 6.34).

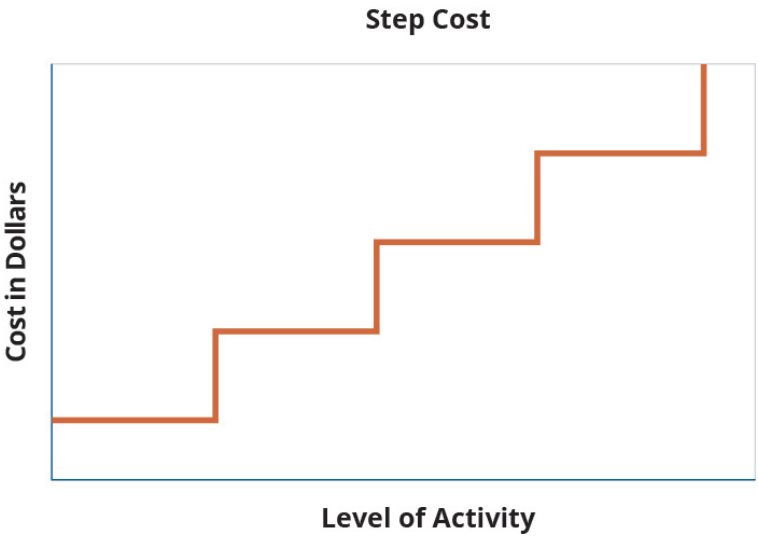


Figure 6.34 Step Cost Graph *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

For example, suppose a quality inspector can inspect a maximum of 80 units in a regular 8-hour shift and his salary is a fixed cost. Then the relevant range for QA inspection is from 0–80 units per shift. If demand for these units increases and more than 80 inspections are needed per shift, the relevant range has been exceeded and the business will have one of two choices:

(1) Pay the quality inspector overtime in order to have the additional units inspected. This overtime will "step up" the variable cost per unit. The advantage to handling the increased cost in this way is that when demand falls, the cost can quickly be "stepped down" again. Because these types of step costs can be adjusted quickly and often, they are often still treated as variable costs for planning purposes.

(2) "Step up" fixed costs. If the company hires a second quality inspector, they would be stepping up their fixed costs.

In effect, they will double the relevant range to allow for a maximum of 160 inspections per shift, assuming the second QA inspector can inspect an additional 80 units per shift. The down side to this approach is that once the new QA inspector is hired, if demand falls again, the company will be incurring fixed costs that are unnecessary. For this reason, adding salaried personnel to address a short-term increase in demand is not a decision most businesses make.

Step costs are best explained in the context of a business experiencing increases in activity beyond the relevant range. As an example, let's return to Tony's T-Shirts.

Tony's cost of operations and the associated relevant ranges are shown in Table 6.9.

Table 6.9 Tony's T-Shirts Cost Options By: Rice University Openstax CC BY-NC-SA 4.0

–	Cost	Type of Cost	Relevant Range
Lease on Screen-Printing Machine	$2,000 per month	Fixed	0–2,000 T-shirts per month
Employee	$10 per hour	Variable	20 shirts per hour
Tony's Salary	$2,500 per month	Fixed	N/A
Screen-Printing Ink	$0.25 per shirt	Variable	N/A
Building Rent	$1,500 per month	Fixed	2 screen-printing machines and 2 employees

As you can see, Tony has both fixed and variable costs associated with his business. His one screen-printing machine can only produce 2,000 T-shirts per month and his current employee can produce 20 shirts per hour (160 per 8-hour work day). The space that Tony leases is large enough that he could add an additional screen-printing machine and 1 additional

employee. If he expands beyond that, he will need to lease a larger space, and presumably his rent would increase at that point. It is easy for Tony to predict his costs as long as he operates within the relevant ranges by applying the total cost equation $Y = a + bx$. So, for Tony, as long as he produces 2,000 or fewer T-shirts, his total cost will be found by $Y = \$6{,}000 + \$0.75x$, where the variable cost of $0.75 is the $0.25 cost of the ink per shirt and $0.50 per shirt for labor ($10 per hour wage/20 shirts per hour). As soon as his production passes the 2,000 T-shirts that his one employee and one machine can handle, he will have to add a second employee and lease a second screen-printing machine. In other words, his fixed costs will rise from $6,000 to $8,000, and his variable cost per T-shirt will rise from $0.75 to $1.25 (ink plus 2 workers). Thus, his new cost equation is $Y = \$8{,}000 + \$1.25x$ until he "steps up" again and adds a third machine *and* moves to a new location with a presumably higher rent. Let's take a look at this in chart form to better illustrate the "step" in cost Tony will experience as he steps past 2,000 T-shirts.

Tony's cost information is shown in the chart for volume between 500 and 4,000 shirts.

Number of T-Shirts	Total Cost (rounded)
500	$ 6,375
750	6,563
1,000	6,750
1,250	6,938
1,500	7,125
1,750	7,313
2,000	7,500
2,250	10,813
2,500	11,125
2,750	11,438
3,000	11,750
3,250	12,063
3,500	12,375
3,750	12,688

Figure 6.35 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

When presented graphically, notice what happens when Tony steps outside of his original relevant range and has to add a second employee and a second screen-printing machine:

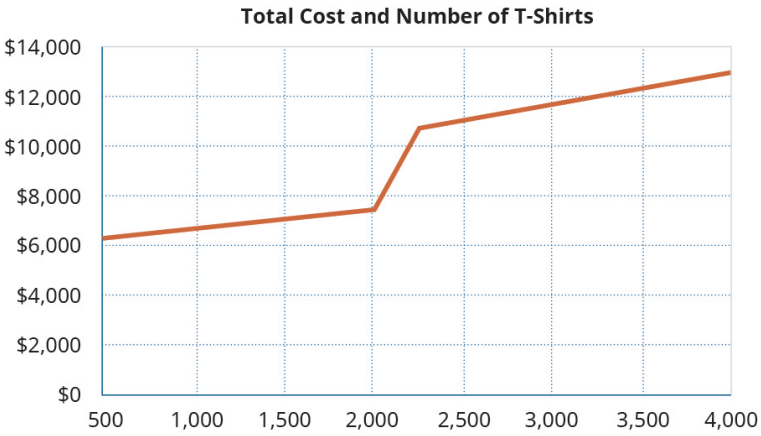


Figure 6.36 Stepped Variable Costs for Tony's T-Shirts *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

It is important to remember that even though Tony's costs stepped up when he exceeded his original capacity (relevant range), the *behavior* of the costs did not change. His fixed costs still remained fixed in total and his total variable cost rose as the number of T-shirts he produced rose. Table 6.10 summarizes how costs behave within their relevant ranges.

Table 6.10 Summary of Fixed and Variable Cost Behaviors By: Rice University Openstax CC BY-NC-SA 4.0

Cost	In Total	Per Unit
Variable Cost	Changes in response to the level of activity	Remains fixed per unit regardless of the level of activity
Fixed Cost	Does not change with the level of activity, within the relevant range, but does change when the relevant range changes	Changes based upon activity within the relevant range: increased activity decreases per-unit cost; decreased activity increases per-unit cost

Product versus Period Costs

Many businesses can make decisions by dividing their costs into fixed and variable costs, but there are some business decisions that require grouping costs differently. Sometimes companies need to consider how those costs are reported in the financial statements. At other times, companies group costs based on functions within the business. For example, a business would group administrative and selling expenses by the period (monthly or quarterly) so that they can be reported on an Income Statement. However, a manufacturing firm may carry product costs such as materials from one period to the other in order to have the costs "travel" with the units being produced. It is possible that both the selling and administrative costs and materials costs have both fixed and variable components. As a result, it may be necessary to analyze some fixed costs together with some variable costs. Ultimately, businesses strategically group costs in order to make them more useful for decision-making and planning. Two of the broadest and most common grouping of costs are product costs and period costs.

Product costs are all those associated with the acquisition or production of goods and products. When products are purchased for resale, the cost of goods is recorded as an asset on the company's balance sheet. It is not until the products are sold that they become an expense on the income statement. By moving product costs to the expense account for the cost of goods sold, they are easily matched to the sales revenue income account. For example, Bert's Bikes is a bicycle retailer who purchases bikes from several wholesale distributors and manufacturers. When Bert purchases bicycles for resale, he places the cost of the bikes into his inventory account, because that is what those bikes are—his inventory available for sale. It is not until someone purchases a bike that it creates sales revenue, and in order to fulfill the requirements of double-

entry accounting, he must match that income with an expense: the cost of goods sold (Figure 6.37).

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cost of Goods Sold	25,000	
	Finished Goods Inventory		25,000
	To record the cost of products sold		

Figure 6.37 Journal Entry for Cost of Goods Sold *Product costs are collected in the finished goods inventory, where they remain until the goods are sold By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Some product costs have both a fixed and variable component. For example, Bert purchases 10 bikes for $100 each. The distributor charges $10 per bike for shipping for 1 to 10 bikes but $8 per bike for 11 to 20 bikes. This shipping cost is fixed per unit but varies in total. If Bert wants to save money and control his cost of goods sold, he can order an 11th bike and drop his shipping cost by $2 per bike. It is important for Bert to know what is fixed and what is variable so that he can control his costs as much as possible.

What about the costs Bert incurs that are not product costs? Period costs are simply all of the expenses that are not product costs, such as all selling and administrative expenses. It is important to remember that period costs are treated as expenses in the period in which they occur. In other words, they follow the rules of accrual accounting practice by recognizing the cost (expense) in the period in which they occur regardless of when the cash changes hands. For example, Bert pays his business insurance in January of each year. Bert's annual insurance premium is $10,800, which is $900 per month. Each month, Bert will recognize 1 ÷ 12 of this insurance cost as an expense in the period in which it is incurred (Figure 6.38).

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Insurance Expense	900	
	Prepaid Insurance		900
	To recognize current period insurance expense		

Figure 6.38 Journal Entry for Insurance Expense *Bert applies 1 ÷ 12 of the prepaid insurance premium per month to the expense account in order to match period costs with period revenues By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Why is it so important for Bert to know which costs are product costs and which are period costs? Bert may have little control over his product costs, but he maintains a great deal of control over many of his period costs. For this reason, it is important that Bert be able to identify his period costs and then determine which of them are fixed and which are variable. Remember that fixed costs are fixed over the relevant range, but variable costs change with the level of activity. If Bert wants to control his costs to make his bike business more profitable, he must be able to differentiate between the costs he can and cannot control.

Just like a merchandising business such as Bert's Bikes, manufacturers also classify their costs as either product costs or period costs. For a manufacturing business, product costs are the costs associated with making the product, and period costs are all other costs. For the purposes of external reporting, separating costs into period and product costs is not all that is necessary. However, for management decision-making activities, refinement of the types of product costs is helpful.

In a manufacturing firm, the need for management to be aware of the types of costs that make up the cost of a product is of paramount importance. Let's look at Carolina Yachts again and examine how they can classify the product costs associated with building their sportfishing boats. Just like automobiles, every year, Carolina Yachts makes changes to their boats, introducing new models to their product line.

When the engineers begin to redesign boats for the next year, they must be careful not to make changes that would drive the selling price of their boats too high, making them less attractive to the customer. The engineers need to know exactly what the addition of another feature will do to the cost of production. It is not enough for them to get total product cost data; instead, they need specific information about the three classes of product costs: materials, labor, and overhead.

As you've learned, direct materials are the raw materials and component parts that are directly economically traceable to a unit of production.

Table 6.11 provides some examples of direct materials.

Table 6.11 Examples of Direct Materials By: Rice University Openstax CC BY-NC-SA 4.0

Manufacturing Business	Product	Direct Materials
Bakery	Birthday cakes	Flour, sugar, eggs, milk
Automobile manufacturer	Cars	Glass, steel, tires, carpet
Furniture manufacturer	Recliners	Wood, fabric, cotton batting

In each of the examples, managers are able to trace the cost of the materials directly to a specific unit (cake, car, or chair) produced. Since the amount of direct materials required will change based on the number of units produced, direct materials are almost always classified as a variable cost. They remain fixed per unit of production but change in total based on the level of activity within the business.

It takes more than materials for Carolina Yachts to build a boat. It requires the application of labor to the raw materials and component parts. You've also learned that direct labor is the work of the employees who are directly involved in the production of goods or services. In fact, for many industries, the largest cost incurred in the production process is labor.

For Carolina Yachts, their direct labor would include the wages paid to the carpenters, painters, electricians, and welders who build the boats. Like direct materials, direct labor is typically treated as a variable cost because it varies with the level of activity. However, there are some companies that pay a flat weekly or monthly salary for production workers, and for these employees, their compensation could be classified as a fixed cost. For example, many auto mechanics are now paid a flat weekly or monthly salary.

While in the example Carolina Yachts is dependent upon direct labor, the production process for companies in many industries is moving from human labor to a more automated production process. For these companies, direct labor in these industries is becoming less significant. For an example, you can research the current production process for the automobile industry.

The third major classification of product costs for a manufacturing business is overhead. Manufacturing overhead (sometimes referred to as *factory overhead*) includes all of the costs that a manufacturing business incurs, other than the variable costs of direct materials and direct labor required to build products. These overhead costs are not directly attributable to a specific unit of production, but they are incurred to support the production of goods. Some of the items included in manufacturing overhead include supervisor salaries, depreciation on the factory, maintenance, insurance, and utilities. It is important to note that manufacturing overhead does not include any of the selling or administrative functions of a business. For Carolina Yachts, costs like the sales, marketing, CEO, and clerical staff salaries will not be included in the calculation of manufacturing overhead costs but will instead be allocated to selling and administrative expenses.

As you have learned, much of the power of managerial accounting is its ability to break costs down into the smallest possible trackable unit. This also applies to manufacturing

overhead. In many cases, businesses have a need to further refine their overhead costs and will track indirect labor and indirect materials.

When labor costs are incurred but are not directly involved in the active conversion of materials into finished products, they are classified as indirect labor costs. For example, Carolina Yachts has production supervisors who oversee the manufacturing process but do not actively participate in the construction of the boats. Their wages generally support the production process but cannot be traced back to a single unit. For this reason, the production supervisors' salary would be classified as indirect labor. Similar to direct labor, on a product or department basis, indirect labor, such as the supervisor's salary, is often treated as a fixed cost, assuming that it does not vary with the level of activity or number of units produced. However, if you are considering the supervisor's salary cost on a per unit of production basis, then it could be considered a variable cost.

Similarly, not all materials used in the production process can be traced back to a specific unit of production. When this is the case, they are classified as indirect material costs. Although needed to produce the product, these indirect material costs are not traceable to a *specific* unit of production. For Carolina Yachts, their indirect materials include supplies like tools, glue, wax, and cleaning supplies. These materials are required to build a boat, but management cannot easily track how much of a bottle of glue they use or how often they use a particular drill to build a specific boat. These indirect materials and their associated cost represent a small fraction of the total materials needed to complete a unit of production. Like direct materials, indirect materials are classified as a variable cost since they vary with the level of production. Table 6.12 provides some examples of manufacturing costs and their classifications.

Table 6.12 Examples of Classifications of Manufacturing Costs By: Rice University Openstax CC BY-NC-SA 4.0

Cost	Classification	Fixed or Variable
Production supervisor salary	Indirect labor	Fixed
Raw materials used in production	Direct materials	Variable
Wages of production employees	Direct labor	Variable
Straight-line depreciation on factory equipment	General manufacturing overhead	Fixed
Glue and adhesives	Indirect materials	Variable

Prime Costs versus Conversion Costs

In certain production environments, once a business has separated the costs of the product into direct materials, direct labor, and overhead, the costs can then be gathered into two broader categories: prime costs and conversion costs. Prime costs are the direct material expenses and direct labor costs, while conversion costs are direct labor and general factory overhead combined. Please note that these two categories of costs are examples of cost categories where a particular cost can be included in both. In this case, direct labor is included in both prime costs and conversion costs.

These cost classifications are common in businesses that produce large quantities of an item that is then packaged into smaller, sellable quantities such as soft drinks or cereal. In these types of production environments, it easier to lump the costs of direct labor and overhead into one category, since these costs are what are needed to convert raw materials into a finished product.

Although it seems as if there are many classifications or labels associated with costs, remember that the purpose of

cost classification is to assist managers in the decision-making process. Since this type of data is not used for external reporting purposes, it is important to understand that (1) a single cost can have many different labels; (2) the terms are used independently, not simultaneously; and (3) each classification is important to understand in order to make business decisions. Figure 6.39 uses some example costs to demonstrate these principles.

						Product				
Cost	Fixed	Variable	Mixed	Step	Period	DM	DL	OH	Prime	Conversion
Rent on production facility	√						OH			√
Plant supervisor salary	√						OH			√
Raw materials		√					DM		√	
Administrative salaries	√				√					
Commissioned sales staff		√	√		√					
Delivery truck			√		√					
Advertising	√				√					
Plant utilities			√				OH			√
Income tax		√		√	√					

Figure 6.39 Classification Based on Cost Function *Costs can fall into more than one category, sometimes making the process of cost identification complex. DM, direct materials; DL, direct labor; OH, overhead. Classification Based on Cost Function. By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Effects of Changes in Activity Level on Unit Costs and Total Costs

We have spent considerable time identifying and describing the various ways that businesses categorize costs. However, categorization itself is not enough. It is important not only to understand the categorization of costs but to understand the relationships between changes in activity levels and the changes in costs in total. It is worth repeating that when a cost is considered to be fixed, that cost is only fixed for the relevant range. Once the boundary of the relevant range has been reached or moved beyond, fixed costs will change and

then remain fixed for the new relevant range. Remember that, within a relevant range of activity, where the relevant range refers to a specific activity level that is bounded by a minimum and maximum amount, total fixed costs are constant, but costs change on a per-unit basis. Let's examine an example that demonstrates how changes in activity can affect costs.

YOUR TURN

Spring Break Trip Planning

Margo is planning an 8-day spring break trip from Atlanta, Georgia, to Tampa, Florida, leaving on Sunday and returning the following Sunday. She has located a condominium on the beach and has put a deposit down on the unit. The rental company has a maximum occupancy for the condominium of seven adults. There is an amusement park that she plans to visit. She is going to use her parents' car, an SUV that can carry up to six people and their luggage. The SUV can travel an average of 20 miles per gallon, the total distance is approximately 1,250 miles (550 miles each way plus driving around Tampa every day), and the average price of gas is $3 per gallon. A season pass for an amusement park she wants to visit is $168 per person. Margo estimates spending $40 per day per person for food. She estimates the costs for the trip as follows:

Condo Rental	$1,400
Gasoline	188
Food (per person per day)	40
Amusement Park Season Pass (per person)	168

Figure 6.40 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Now that she has cost estimates, she is trying to decide how many of her friends she wants to invite. Since the car can only seat six people, Marg made a list of five other girls to invite. Use her data to answer the following questions and fill out the cost table:

1. What are the total variable costs for the trip?
2. What are the average variable costs for the trip?
3. What are the total fixed costs for the trip?
4. What are the average fixed costs for the trip?
5. What are the average costs per person for the trip?
6. What would the trip cost Margo if she were to go alone?

Number of People, Including Margo	Total Variable Cost	Average Variable Cost	Total Fixed Cost	Average Fixed Cost	Average Cost per Person
1					
2					
3					
4					
5					
6					

Figure 6.41 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

7. What additional costs would be incurred if a seventh girl was invited on the trip? Would this be a wise decision (from a cost perspective)? Why or why not?
8. Which cost will *not* be affected if a seventh girl was invited on the trip?

Solution

Number of People, Including Margo	Total Variable Cost	Average Variable Cost	Total Fixed Cost	Average Fixed Cost	Average Cost per Person
1	$488	$488	$1,588	$1,588	$2,076
2	976	488	1,588	794	1,282
3	1,464	488	1,588	529	1,017
4	1,952	488	1,588	397	885
5	2,440	488	1,588	318	806
6	2,928	488	1,588	265	753

Figure 6.42 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Answers will vary. All responses should recognize that there is no room in the car for the seventh girl and her luggage, although the condominium will accommodate the extra person. This means they will have to either find a larger vehicle and incur higher gas expenses or take a second car, which will at least double the fixed gas cost.

Long Descriptions

A graph shows the mixed costs for Ocean Breeze. The x-axis lists the number of rooms, ranging from 0 to 100. The y-axis lists this mixed occupancy tax, ranging from $0 to $3,500. Fixed costs points are marked at the points of 0 rooms and $2,000, 60 rooms and $2,000, 85 rooms and $2,000, and 100 rooms and $2,000. Variable costs are marked at the points of 0 rooms and $2,000, 60 rooms and $2,300, 85 rooms and $2,425, and 100 rooms and $2,500. The section of the graph that includes both fixed and variable costs is labeled as total mixed costs. Return

Graph with Total cost as the y axis (0 to $14,000) and number of T-Shirts as the x axis (500 to 4,000.) The line hits the y axis at just above $6,375 for 500 shirts, heads in a straight line to

slightly up and to the right until it gets to 2,000 shirts at $7,500. Then the line takes a sharp turn up to 2,250 shirts at $10,813, then levels off in a straight line slightly up and to the right to 3,750 shirts at $12,688. Return

Chart showing classification of different costs: Rent on production facility is fixed, product, overhead, conversion; Plant supervisor salary is fixed, product, overhead conversion; Raw materials are variable, product, direct materials, prime; Administrative salaries are fixed, period. Commissioned sales staff are variable, period; Delivery truck is mixed, period; Advertising is fixed, period; Plant utilities are mixed, product, overhead, conversion; Income tax is variable, step, period. Return

Chart showing classification of different costs: Rent on production facility is fixed, product, overhead, conversion; Plant supervisor salary is fixed, product, overhead conversion; Raw materials are variable, product, direct materials, prime; Administrative salaries are fixed, period. Commissioned sales staff are variable, period; Delivery truck is mixed, period; Advertising is fixed, period; Plant utilities are mixed, product, overhead, conversion; Income tax is variable, step, period. Return

Footnotes

9 “Attribution: Modification of work by Sharon Kioko and Justin Marlowe. “Cost Analysis.” Financial Strategy for Public Managers. CC BY 4.0. https://press.rebus.community/financialstrategy/chapter/cost-analysis/

CHAPTER 7- COST-VOLUME-PROFIT ANALYSIS

CVP

7.1 Exploring Contribution Margin

Before examining contribution margins, let's review some key concepts: fixed costs, relevant range, variable costs, and contribution margin. Fixed costs are those costs that will not change within a given range of production. For example, in the current case, the fixed costs will be the student sales fee of $100. No matter how many shirts the club produces within the relevant range, the fee will be locked in at $100. The relevant range is the anticipated production activity level. Fixed costs remain constant within a relevant range. If production levels exceed expectations, then additional fixed costs will be required.

For example, assume that the students are going to lease vans from their university's motor pool to drive to their conference. A university van will hold eight passengers, at a cost of $200 per van. If they send one to eight participants, the fixed cost for the van would be $200. If they send nine to sixteen students, the fixed cost would be $400 because they will need two vans. We would consider the relevant range to be between one and eight passengers, and the fixed cost in this range would be $200. If they exceed the initial relevant range, the fixed costs would increase to $400 for nine to sixteen passengers.

Variable costs are those costs that vary per unit of production. Direct materials are often typical variable costs, because you normally use more direct materials when you produce more items. In our example, if the students sold 100 shirts, assuming an individual variable cost per shirt of $10, the total variable costs would be $1,000 (100 × $10). If they sold 250

shirts, again assuming an individual variable cost per shirt of $10, then the total variable costs would $2,500 (250 × $10).

Contribution margin is the amount by which a product's selling price exceeds its total variable cost per unit. This difference between the sales price and the per unit variable cost is called the contribution margin because it is the per unit contribution toward covering the fixed costs. It typically is calculated by comparing the sales revenue generated by the sale of one item versus the variable cost of the item:

Contribution Margin = Sales – Variable Costs

Figure 7.1 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

In our example, the sales revenue from one shirt is $15 and the variable cost of one shirt is $10, so the individual contribution margin is $5. This $5 contribution margin is assumed to first cover fixed costs first and then realized as profit.

It is not just small operations that benefit from cost-volume-profit (CVP) analysis. At some point, all businesses find themselves asking the same basic questions: How many units must be sold in order to reach a desired income level? How much will each unit cost? How much of the sales price from each unit will help cover our fixed costs? For example, **Starbucks** faces these same questions every day, only on a larger scale. When they introduce new menu items, such as seasonal specialty drinks, they must determine the fixed and variable costs associated with each item. Adding menu items may not only increase their fixed costs in the short run (via advertising and promotions) but will bring new variable costs. **Starbucks** needs to price these drinks in a way that covers the variable costs per unit and additional fixed costs and contributes to overall net income. Regardless of how large or small the enterprise, understanding how fixed costs, variable

costs, and volume are related to income is vital for sound decision-making.



Figure 7.2 StarbucksVaughanMills *Starbucks. Large corporations like Starbucks use cost-volume-profit analysis to make decisions about their products and services to ensure that they are maximizing their revenues. StarbucksVaughanMills. By: Raysonho Source: wikimediacommons CC0*

Understanding how to use fixed costs, variable costs, and sales in CVP analyses requires an understanding of the term margin. You may have heard that restaurants and grocery stores have very low margins, while jewelry stores and furniture stores have very high margins. What does "margin" mean? In the broadest terms, margin is the difference between a product or service's selling price and its cost of production. Recall the accounting club's T-shirt sale. The difference between the sales price per T-shirt and the purchase price of the T-shirts was the accounting club's margin:



Figure 7.3 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

We previously learned the characteristics of fixed and variable costs and introduced the basics of cost behavior. Let's now apply these behaviors to the concept of contribution margin. The company will use this "margin" to cover fixed expenses and hopefully to provide a profit. Let's begin by examining contribution margin on a per unit basis.

Unit Contribution Margin

When the contribution margin is calculated on a per unit basis, it is referred to as the contribution margin per unit or unit contribution margin. You can find the contribution margin per unit using the equation shown in Figure 7.4.

Per Unit Sales Price – Variable Cost per Unit = Contribution Margin per Unit

Figure 7.4 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

It is important to note that this unit contribution margin can be calculated either in dollars or as a percentage. To demonstrate

this principle, let's consider the costs and revenues of Hicks Manufacturing, a small company that manufactures and sells birdbaths to specialty retailers.

Hicks Manufacturing sells its Blue Jay Model for $1100 and incurs variable costs of $20 per unit. In order to calculate their per unit contribution margin, we use the formula in Figure 7.5 to determine that on a *per unit* basis, their contribution margin is:

HICKS MANUFACTURING Blue Jay Model For Year Ended December 31, 2019	
Sales Price per Unit	$100
– Variable Cost per Unit	20
= Contribution Margin per Unit	$ 80

Figure 7.5 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

This means that for every Blue Jay model they sell, they will have $80 to *contribute* toward covering fixed costs, such as rent, insurance, and manager salaries. But Hicks Manufacturing manufactures and sells more than one model of birdbath. They also sell a Cardinal Model for $75, and these birdbaths incur variable costs of $15 per unit. For the Cardinal Model, their contribution margin on a per unit basis is the $75 sales price less the $15 per unit variable costs is as follows:

HICKS MANUFACTURING Cardinal Model For Year Ended December 31, 2019	
Sales Price per Unit	$75
– Variable Cost per Unit	15
= Contribution Margin per Unit	$60

Figure 7.6 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

This demonstrates that, for every Cardinal model they sell, they will have $60 to *contribute* toward covering fixed costs and, if there is any left, toward profit. Every product that a company manufactures or every service a company provides will have a unique contribution margin per unit. In these examples, the contribution margin per unit was calculated in dollars per unit, but another way to calculate contribution margin is as a ratio (percentage).



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Contribution Margin Ratio

The contribution margin ratio is the percentage of a unit's

selling price that exceeds total unit variable costs. In other words, contribution margin is expressed as a percentage of sales price and is calculated using this formula:

$$\text{Contribution Margin Ratio} = \frac{\text{Contribution Margin per Unit}}{\text{Sales Price per Unit}}$$

Figure 7.7 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

For Hicks Manufacturing and their Blue Jay Model, the contribution margin ratio will be

$$\frac{\$80 \text{ Contribution Margin per Unit}}{\$100 \text{ Sales Price per Unit}} = 0.80$$

Figure 7.8 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

At a contribution margin ratio of 80%, approximately $0.80 of each sales dollar generated by the sale of a Blue Jay Model is available to cover fixed expenses and contribute to profit. The contribution margin ratio for the birdbath implies that, for every $1 generated by the sale of a Blue Jay Model, they have $0.80 that contributes to fixed costs and profit. Thus, 20% of each sales dollar represents the variable cost of the item and 80% of the sales dollar is margin. Just as each product or service has its own contribution margin on a per unit basis, each has a unique contribution margin ratio. Although this process is extremely useful for analyzing the profitability of a single product, good, or service, managers also need to see the “big picture” and will examine contribution margin in total across all products, goods, or services.

YOUR TURN

Margin at the Kiosk

You rent a kiosk in the mall for $300 a month and use it to sell T-shirts with college logos from colleges and universities all over the world. You sell each T-shirt for $25, and your cost for each shirt is $15. You also pay your sales person a commission of $0.50 per T-shirt sold in addition to a salary of $400 per month. Construct a contribution margin income statement for two different months: in one month, assume 100 T-shirts are sold, and in the other, assume 200 T-shirts are sold.

Solution

Pertinent information		Contribution margin income statement 100 units sold		Contribution margin income statement 200 units sold	
Sales price per unit	$ 25	Sales revenue	$2,500	Sales revenue	$5,000
Variable costs:		Variable costs per unit ($15 + 0.50) x 100 units	1,550	Variable costs per unit ($15 + 0.50) x 200 units	3,100
Per shirt cost	15	Contribution margin	950	Contribution margin	1,900
Per shirt commission	0.50	Fixed costs	700	Fixed costs	700
Fixed costs:		Net operating income	$ 250	Net operating income	$1,200
Kiosk rental	300				
Salary	400				

Figure 7.9 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Total Contribution Margin

This “big picture” is gained by calculating total contribution margin—the total amount by which total sales exceed total variable costs. We calculate total contribution margin by multiplying per unit contribution margin by sales volume or

number of units sold. This approach allows managers to determine how much profit a company is making before paying its fixed expenses. For Hicks Manufacturing, if the managers want to determine how much their Blue Jay Model contributes to the overall profitability of the company, they can calculate total contribution margin as follows:

HICKS MANUFACTURING Blue Jay Model For Month Ended April, 2019	
Units Sold	500
Contribution Margin per Unit	×$ 80
Total Contribution Margin	$40,000

Figure 7.10 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

For the month of April, sales from the Blue Jay Model contributed $36,000 toward fixed costs. Looking at contribution margin in total allows managers to evaluate whether a particular product is profitable and how the sales revenue from that product contributes to the overall profitability of the company. In fact, we can create a specialized income statement called a contribution margin income statement to determine how changes in sales volume impact the bottom line.

To illustrate how this form of income statement can be used, contribution margin income statements for Hicks Manufacturing are shown for the months of April and May.

In April, Hicks sold 500 Blue Jay Models at $100 per unit,

which resulted in the operating income shown on the contribution margin income statement:

HICKS MANUFACTURING Contribution Margin Income Statement For Month Ended April, 2019	
Sales (500 units at $100 per unit)	$50,000
Variable Cost (500 units at $20 per unit)	10,000
Contribution Margin	40,000
Fixed Costs	23,000
Operating Income	$17,000

Figure 7.11 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

In May, 750 of the Blue Jay models were sold as shown on the contribution margin income statement. When comparing the two statements, take note of what changed and what remained the same from April to May.

HICKS MANUFACTURING Contribution Margin Income Statement For Month Ended May, 2019	
Sales (750 units at $100 per unit)	$75,000
Variable Cost (750 units at $20 per unit)	15,000
Contribution Margin	60,000
Fixed Costs	23,000
Operating Income	$37,000

Figure 7.12 *By: Rice University Source: OpenstaxCC BY-NC-SA 4.0 Long Description*

Using this contribution margin format makes it easy to see the impact of changing sales volume on operating income. Fixed costs remained unchanged; however, as more units are produced and sold, more of the per-unit sales price is available to contribute to the company's net income.

Before going further, let's note several key points about CVP and the contribution margin income statement. First, the contribution margin income statement is used for *internal* purposes and is not shared with external stakeholders. Secondly, in this specialized income statement, when "*operating* income" is shown, it actually refers to "net operating income" *without regard to income taxes*. Companies can also consider taxes when performing a CVP analysis to project both net operating income and net income. (The preparation of contribution margin income statements with regard to taxes is covered in advanced accounting courses; here, we will consider net income as net operating income without regard to taxes.)

Regardless of whether contribution margin is calculated on a per-unit basis, calculated as a ratio, or incorporated into an income statement, all three express how much sales revenue is available to cover fixed expenses and contribute to profit. Let's examine how all three approaches convey the same financial performance, although represented somewhat differently.

You will recall that the per-unit contribution margin was $80 for a Hicks Blue Jay birdbath. When Hicks sold 500 units, each unit contributed $80 to fixed expenses and profit, which can be verified from April's income statement:

April Total Contribution Margin	$40,000
Per Unit Contribution Margin	$ 80

$$\frac{\textbf{Total Contribution Margin}}{\textbf{Per Unit Contribution Margin}} = \textbf{Number of Units Sold} = \frac{\$40{,}000}{80} = 500 \text{ units}$$

Figure 7.13 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Now, let's use May's Contribution Margin Income Statement as previously calculated to verify the contribution margin based on the contribution margin ratio previously calculated, which was 80%, by applying this formula:

Total Sales × Contribution Margin Ratio = Total Contribution Margin

May Total Sales	$75,000
Contribution Margin Ratio	80%

$75,000 × 0.80 = $60,000

Figure 7.14 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Regardless of how contribution margin is expressed, it provides critical information for managers. Understanding how each product, good, or service contributes to the organization's profitability allows managers to make decisions such as which product lines they should expand or which might be discontinued. When allocating scarce resources, the contribution margin will help them focus on those products or services with the highest margin, thereby maximizing profits.



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The Evolution of Cost-Volume-Profit Relationships

The CVP relationships of many organizations have become more complex recently because many labor-intensive jobs have been replaced by or supplemented with technology, changing both fixed and variable costs. For those organizations that are still labor-intensive, the labor costs tend to be variable costs, since at higher levels of activity there will be a demand for more labor usage. For example, assuming one worker is needed for every 50 customers per hour, we might need two workers for an average sales season, but during the Thanksgiving and Christmas season, the store might experience 250 customers per hour and thus would need five workers.

However, the growing trend in many segments of the economy is to convert labor-intensive enterprises (primarily variable costs) to operations heavily dependent on equipment or technology (primarily fixed costs). For example, in retail, many functions that were previously performed by people are now performed by machines or software, such as the self-checkout counters in stores such as **Walmart**, **Costco**, and **Lowe's**. Since machine and software costs are often depreciated or amortized, these costs tend to be the same or fixed, no matter the level of activity within a given relevant range.

In China, completely unmanned grocery stores have been created that use facial recognition for accessing the store. Patrons will shop, bag the purchased items, leave the store, and be billed based on what they put in their bags. Along with managing the purchasing process, inventory is maintained by sensors that let managers know when they need to restock an item.

In the United States, similar labor-saving processes have

been developed, such as the ability to order groceries or fast food online and have it ready when the customer arrives. Another major innovation affecting labor costs is the development of driverless cars and trucks (primarily fixed costs), which will have a major impact on the number of taxi and truck drivers in the future (primarily variable costs). Do these labor-saving processes change the cost structure for the company? Are variable costs decreased? What about fixed costs? Let's look at this in more detail.

When ordering food through an app, there is no need to have an employee take the order, but someone still needs to prepare the food and package it for the customer. The variable costs associated with the wages of order takers will likely decrease, but the fixed costs associated with additional technology to allow for online ordering will likely increase. When grocery customers place their orders online, this not only requires increased fixed costs for the new technology, but it can also increase variable labor costs, as employees are needed to fill customers' online orders. Many stores may move cashier positions to online order fulfillment rather than hiring additional employees. Other stores may have employees fill online grocery orders during slow or downtimes.

Using driverless cars and trucks decreases the variable costs tied to the wages of the drivers but requires a major investment in fixed-cost assets—the autonomous vehicles—and companies would need to charge prices that allowed them to recoup their expensive investments in the technology as well as make a profit. Alternatively, companies that rely on shipping and delivery companies that use driverless technology may be faced with an increase in transportation or shipping costs (variable costs). These costs may be higher because technology is often more expensive when it is new than it will be in the future, when it is easier and more cost effective to produce and also more accessible. A good example of the change in cost of a new technological

innovation over time is the personal computer, which was very expensive when it was first developed but has decreased in cost significantly since that time. The same will likely happen over time with the cost of creating and using driverless transportation.

You might wonder why a company would trade variable costs for fixed costs. One reason might be to meet company goals, such as gaining market share. Other reasons include being a leader in the use of innovation and improving efficiencies. If a company uses the latest technology, such as online ordering and delivery, this may help the company attract a new type of customer or create loyalty with longstanding customers. In addition, although fixed costs are riskier because they exist regardless of the sales level, once those fixed costs are met, profits grow. All of these new trends result in changes in the composition of fixed and variable costs for a company and it is this composition that helps determine a company's profit.

As you will learn in future chapters, in order for businesses to remain profitable, it is important for managers to understand how to measure and manage fixed and variable costs for decision-making. In this chapter, we begin examining the relationship among sales volume, fixed costs, variable costs, and profit in decision-making. We will discuss how to use the concepts of fixed and variable costs and their relationship to profit to determine the sales needed to break even or to reach a desired profit. You will also learn how to plan for changes in selling price or costs, whether a single product, multiple products, or services are involved.

Long Descriptions

Pertinent Information Per Unit, Contribution Margin Income Statement 100 Units Sold, and Contribution Margin Income

Statement 200 Units Sold (respectively): Sales Price (revenue) $25, 2,500, 5,000; Variable Cost 15.50, 1,550, 3,100; Contribution Margin 9.50, 950, 1,900; Fixed Costs: Kiosk Rent 300 and Salary 400, 700, 700; Net Operating Income –, $250, 1,200. Return

Hicks Manufacturing Contribution Margin Income Statement, For the Month Ended April 2019. Sales (500 units at $100 per unit) $50,000 less Variable Cost (500 units at $20 per unit) 10,000 equals Contribution Margin 40,000. Subtract the Fixed Costs of 23,000 to get Operating Income of $17,000. Return

Hicks Manufacturing Contribution Margin Income Statement, For the Month Ended May 2019. Sales (750 units at $100 per unit) $75,000 less Variable Cost (750 units at $20 per unit) 15,000 equals Contribution Margin 60,000. Subtract the Fixed Costs of 23,000 to get Operating Income of $37,000. Return

7.2 Breakeven Analysis

The break-even point is the dollar amount (total sales dollars) or production level (total units produced) at which the company has recovered all variable and fixed costs. In other words, no profit or loss occurs at break-even because Total Cost = Total Revenue. Figure 7.15 illustrates the components of the break-even point:

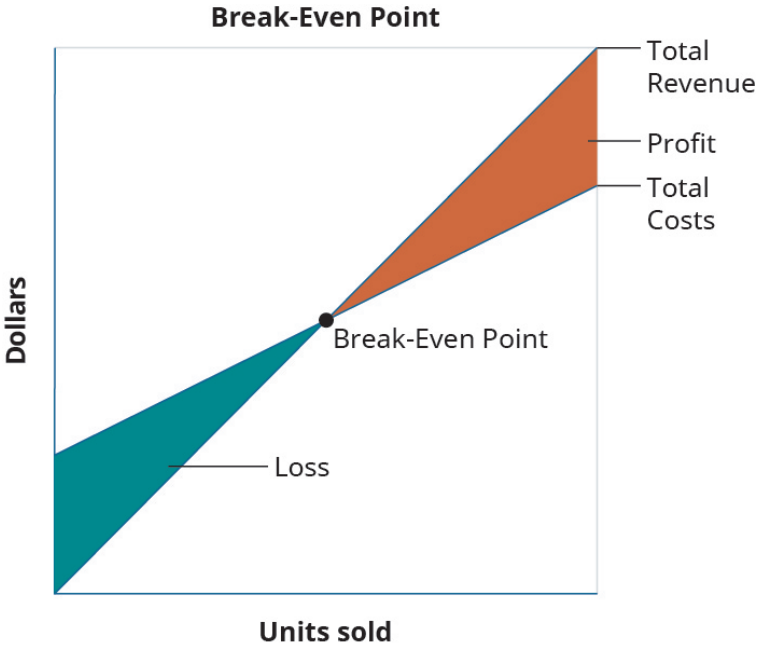


Figure 7.15 Break-Even Point *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

The basic theory illustrated in Figure 7.15 is that, because of the existence of fixed costs in most production processes, in the first stages of production and subsequent sale of the products,

the company will realize a loss. For example, assume that in an extreme case the company has fixed costs of $20,000, a sales price of $400 per unit and variable costs of $250 per unit, and it sells no units. It would realize a loss of $20,000 (the fixed costs) since it recognized no revenue or variable costs. This loss explains why the company's cost graph recognized costs (in this example, $20,000) even though there were no sales. If it subsequently sells units, the loss would be reduced by $150 (the contribution margin) for each unit sold. This relationship will be continued until we reach the break-even point, where total revenue equals total costs. Once we reach the break-even point for each unit sold the company will realize an increase in profits of $150.

For each additional unit sold, the loss typically is lessened until it reaches the break-even point. At this stage, the company is theoretically realizing neither a profit nor a loss. After the next sale beyond the break-even point, the company will begin to make a profit, and the profit will continue to increase as more units are sold. While there are exceptions and complications that could be incorporated, these are the general guidelines for break-even analysis.

As you can imagine, the concept of the break-even point applies to every business endeavor—manufacturing, retail, and service. Because of its universal applicability, it is a critical concept to managers, business owners, and accountants. When a company first starts out, it is important for the owners to know when their sales will be sufficient to cover all of their fixed costs and begin to generate a profit for the business. Larger companies may look at the break-even point when investing in new machinery, plants, or equipment in order to predict how long it will take for their sales volume to cover new or additional fixed costs. Since the break-even point represents that point where the company is neither losing nor making money, managers need to make decisions that will help the company reach and *exceed* this point as quickly as possible.

No business can operate for very long below break-even. Eventually the company will suffer losses so great that they are forced to close their doors.

To illustrate the concept of break-even, we will return to Hicks Manufacturing and look at the Blue Jay birdbath they manufacture and sell.

Sales Where Operating Income Is $0

Hicks Manufacturing is interested in finding out the point at which they break even selling their Blue Jay Model birdbath. They will break even when the operating income is $0. The operating income is determined by subtracting the total variable and fixed costs from the sales revenue generated by an enterprise. In other words, the managers at Hicks want to know how many Blue Jay birdbaths they will need to sell in order to cover their fixed expenses and break even. Information on this product is:

HICKS MANUFACTURING Blue Jay Model For Year Ended December 31, 2019	
Sales Price per Unit	$ 100
Variable Cost per Unit	20
Contribution Margin per Unit	80
Total Fixed Cost per Month	$18,000

In order to find their break-even point, we will use the contribution margin for the Blue Jay and determine how many

contribution margins we need in order to cover the fixed expenses, as shown in the formula in Figure 7.17.

$$\text{Break-Even Point in Units:} \quad \frac{\text{Total Fixed Costs}}{\text{Contribution Margin per Unit}}$$

Figure 7.17 Break-Even Point in Units *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Applying this to Hicks calculates as:

What this tells us is that Hicks must sell 225 Blue Jay Model birdbaths in order to cover their fixed expenses. In other words, they will not begin to show a profit until they sell the 226th unit. This is illustrated in their contribution margin income statement.

HICKS MANUFACTURING Contribution Margin Income Statement For Year Ended December 31, 2019	
Sales (225 units at $100 per return)	$22,500
Variable Cost (225 units at $20 per return)	4,500
Contribution Margin	18,000
Fixed Costs	18,000
Operating Income	$ 0

Figure 7.18 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The break-even point for Hicks Manufacturing at a sales volume of $22,500 (225 units) is shown graphically in Figure 7.19.

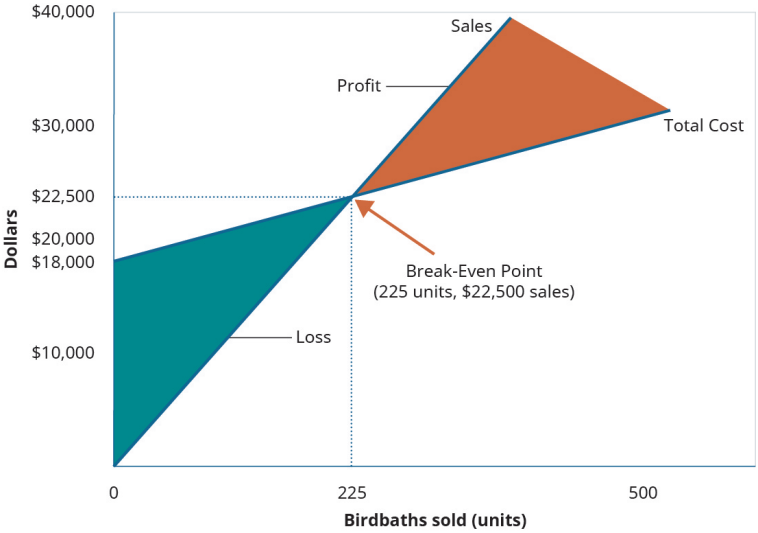


Figure 7.19 Hicks Manufacturing Break-Even Point for 225 Units *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

As you can see, when Hicks sells 225 Blue Jay Model birdbaths, they will make no profit, but will not suffer a loss because all of their fixed expenses are covered. However, what happens when they do not sell 225 units? If that happens, their operating income is negative.

Sales Where Operating Income Is Negative

In a recent month, local flooding caused Hicks to close for several days, reducing the number of units they could ship and sell from 225 units to 175 units. The information in Figure 7.20 reflects this drop in sales.

HICKS MANUFACTURING Contribution Margin Income Statement For Year Ended December 31, 2019	
Sales (175 units at $100 per unit)	$17,500
Variable Cost (175 units at $20 per unit)	3,500
Contribution Margin	14,000
Fixed Costs	18,000
Operating Income	$ (4,000)

Figure 7.20 Hicks Manufacturing Contribution Margin Income Statement *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

At 175 units ($17,500 in sales), Hicks does not generate enough sales revenue to cover their fixed expenses and they suffer a loss of $4,000. They did not reach the break-even point of 225 units.

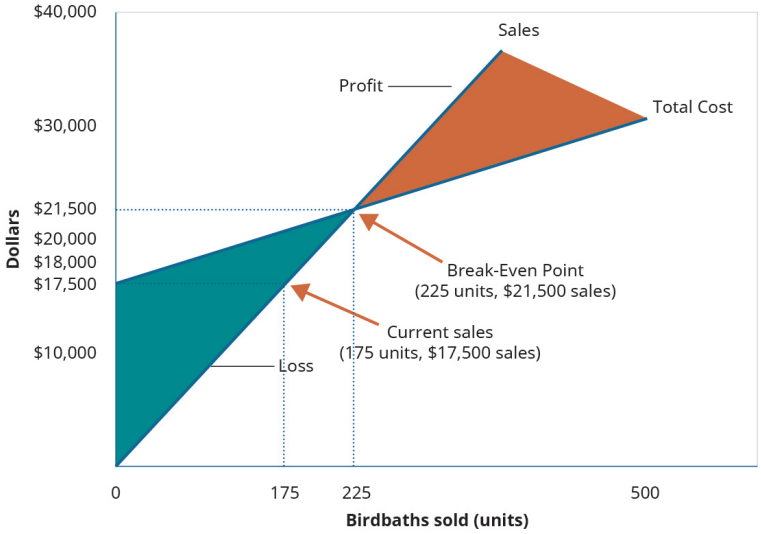


Figure 7.21 Hicks Manufacturing Break-Even Point for 175 Units *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Sales Where Operating Income Is Positive

What happens when Hicks has a busy month and sells 300 Blue Jay birdbaths? We have already established that the contribution margin from 225 units will put them at break-even. When sales exceed the break-even point the unit contribution margin from the additional units will go toward profit. This is reflected on their income statement.

HICKS MANUFACTURING Contribution Margin Income Statement For Year Ended December 31, 2019	
Sales (300 units at $100 per unit)	$30,000
Variable Cost (300 units at $20 per unit)	6,000
Contribution Margin	24,000
Fixed Costs	18,000
Operating Income	$ 6,000

Figure 7.22 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Again, looking at the graph for break-even (Figure 7.23), you will see that their sales have moved them beyond the point where total revenue is equal to total cost and into the profit area of the graph.

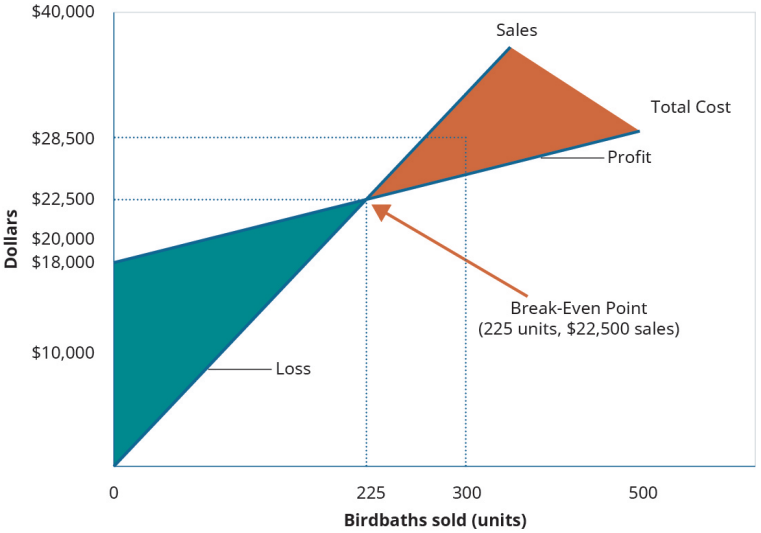


Figure 7.23 Hicks Manufacturing Break-Even Point for 300 Units *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Hicks Manufacturing can use the information from these different scenarios to inform many of their decisions about operations, such as sales goals.

However, using the contribution margin per unit is not the only way to determine a break-even point. Recall that we were able to determine a contribution margin expressed in dollars by finding the contribution margin ratio. We can apply that contribution margin ratio to the break-even analysis to determine the break-even point in dollars. For example, we know that Hicks had $18,000 in fixed costs and a contribution margin ratio of 80% for the Blue Jay model. We will use this ratio (Figure 7.24) to calculate the break-even point in dollars.

$$\text{Break-Even Point in Dollars} = \frac{\text{Fixed Costs}}{\text{Contribution Margin Ratio}}$$

Figure 7.24 Break-Even Point in Dollars *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Applying the formula to Hicks gives this calculation:

Hicks Manufacturing will have to generate $22,500 in monthly sales in order to cover all of their fixed costs. In order for us to verify that Hicks' break-even point is $22,500 (or 225 units) we will look again at the contribution margin income statement at break-even:

HICKS MANUFACTURING Contribution Margin Income Statement For Year Ended December 31, 2019	
Sales (225 units at $100 per unit)	$22,500
Variable Cost (225 units at $20 per unit)	4,500
Contribution Margin	18,000
Fixed Costs	18,000
Operating Income	$ 0

Figure 7.25 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

By knowing at what level sales are sufficient to cover fixed expenses is critical, but companies want to be able to make a profit and can use this break-even analysis to help them.

Examples of the Effects of Variable and Fixed Costs in Determining the Break-Even Point

Companies typically do not want to simply break even, as they are in business to make a profit. Break-even analysis also can help companies determine the level of sales (in dollars or in units) that is needed to make a desired profit. The process for

factoring a desired level of profit into a break-even analysis is to add the desired level of profit to the fixed costs and then calculate a new break-even point. We know that Hicks Manufacturing breaks even at 225 Blue Jay birdbaths, but what if they have a target profit for the month of July? They can simply add that target to their fixed costs. By calculating a target profit, they will produce and (hopefully) sell enough bird baths to cover both fixed costs and the target profit.

If Hicks wants to earn $16,000 in profit in the month of May, we can calculate their new break-even point as follows:

We have already established that the $18,000 in fixed costs is covered at the 225 units mark, so an additional 200 units will cover the desired profit (200 units × $80 per unit contribution margin = $16,000). Alternatively, we can calculate this in terms of dollars by using the contribution margin ratio.

As done previously, we can confirm this calculation using the contribution margin income statement:

Sales (425 units at $100 per unit)	$42,500
Variable Costs (425 units at $20 per unit)	8,500
Contribution Margin	34,000
Fixed Costs	18,000
Operating Income (loss)	$16,000

Figure 7.26 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Note that the example calculations ignored income taxes, which implies we were finding target operating income. However, companies may want to determine what level of sales would generate a desired after-tax profit. To find the break-

even point at a desired after-tax profit, we simply need to convert the desired after-tax profit to the desired pre-tax profit, also referred to as operating income, and then follow through as in the example. Suppose Hicks wants to earn $24,000 after-taxes, what level of sales (units and dollars) would be needed to meet that goal? First, the after-tax profit needs to be converted to a pre-tax desired profit:

If the tax rate for Hicks is 40%, then the $24,000 after-tax profit is equal to a pre-tax profit of $40,000:

The tax rate indicates the amount of tax expense that will result from any profits and 1 – tax rate indicates the amount remaining after taking out tax expense. The concept is similar to buying an item on sale. If an item costs $80 and is on sale for 40% off, then the amount being paid for the item is 60% of the sale price, or $48 ($80 × 60%). Another way to find this involves two steps. First find the discount ($80 × 40% = $32) and then subtract the discount from the sales price ($80 – $32 = $48).

Taxes and profit work in a similar fashion. If we know the profit before tax is $100,000 and the tax rate is 30%, then tax expenses are $100,000 × 30% = $30,000. This means the after-tax income is $100,000 – $30,000 = $70,000. However, in most break-even situations, as well as other decision-making areas, the desired after-tax profit is known, and the pre-tax profit must be determined by dividing the after-tax profit by 1 – tax rate.

To demonstrate the combination of both a profit and the after-tax effects and subsequent calculations, let's return to the Hicks Manufacturing example. Let's assume that we want to calculate the target volume in units and revenue that Hicks must sell to generate an after-tax return of $24,000, assuming the same fixed costs of $18,000.

Since we earlier determined $24,000 after-tax equals

$40,000 before-tax if the tax rate is 40%, we simply use the break-even at a desired profit formula to determine the target sales.

This calculation demonstrates that Hicks would need to sell 725 units at $100 a unit to generate $72,500 in sales to earn $24,000 in after-tax profits.

Alternatively, target sales in sales dollars could have been calculated using the contribution margin ratio:

Once again, the contribution margin income statement proves the sales and profit relationships.

Sales (725 units x $100 per unit)	$ 72,500
Variable costs (725 units x $20 per unit)	(14,500)
Contribution margin	$ 58,000
Fixed costs	(18,000)
Pre-tax profit	$ 40,000
Income tax expense (40%)	(16,000)
After-tax profit	$ 24,000

Figure 7.27 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Thus, to calculate break-even point at a particular after-tax income, the only additional step is to convert after-tax income to pre-tax income prior to utilizing the break-even formula. It is good to understand the impact of taxes on break-even analysis as companies will often want to plan based on the after-tax effects of a decision as the after-tax portion of income is the only part of income that will be available for future use.

Application of Break-Even Concepts for a Service Organization

Because break-even analysis is applicable to any business enterprise, we can apply these same principles to a service organization. For example, Marshall & Hirito is a mid-sized accounting firm that provides a wide range of accounting services to its clients but relies heavily on personal income tax preparation for much of its revenue. They have analyzed the cost to the firm associated with preparing these returns. They have determined the following cost structure for the preparation of a standard 1040A Individual Income Tax Return:

Charge to Client (sales price per return)	$400
Variable Cost per Return	150

Figure 7.28 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

They have fixed costs of $14,000 per month associated with the salaries of the accountants who are responsible for preparing the *Form 1040A*. In order to determine their break-even point, they first determine the contribution margin for the *Form 1040A* as shown:

Sales Price per Return	$400
Variable Cost per Return	150
Contribution Margin per Return	250

Figure 7.29 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Now they can calculate their break-even point:

Remember, this is the break-even point in units (the number of tax returns) but they can also find a break-even point expressed in dollars by using the contribution margin ratio. First, they find the contribution margin ratio. Then, they use the ratio to calculate the break-even point in dollars:

We can confirm these figures by preparing a contribution margin income statement:

MARSHALL & SON, CPAs Contribution Margin Income Statement For Year Ended December 31, 2019	
Sales (56 at $400 per return)	$22,400
Variable Costs (56 at $150 per return)	8,400
Contribution Margin	14,000
Fixed costs	14,000
Operating Income (loss)	$ 0

Figure 7.30 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Therefore, as long as Marshall & Hirito prepares 56 *Form 1040* income tax returns, they will earn no profit but also incur no loss. What if Marshall & Hirito has a target monthly profit of $10,000? They can use the break-even analysis process to determine how many returns they will need to prepare in order to cover their fixed expenses and reach their target profit:

They will need to prepare 96 returns during the month in order to realize a $10,000 profit. Expressing this in dollars instead of

units requires that we use the contribution margin ratio as shown:

Marshall & Hirito now knows that, in order to cover the fixed costs associated with this service, they must generate $38,400 in revenue. Once again, let's verify this by constructing a contribution margin income statement:

MARSHALL & SON, CPAs Contribution Margin Income Statement For Year Ended December 31, 2019	
Sales (96 at $400 per return)	$38,400
Variable Costs (96 at $150 per return)	14,400
Contribution Margin	24,000
Fixed Costs	14,000
Operating Income (loss)	$10,000

Figure 7.31 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

As you can see, the $38,400 in revenue will not only cover the $14,000 in fixed costs, but will supply Marshall & Hirito with the $10,000 in profit (net income) they desire.

As you've learned, break-even can be calculated using either contribution margin per unit or the contribution margin ratio. Now that you have seen this process, let's look at an example of these two concepts presented together to illustrate how either method will provide the same financial results.

Suppose that Channing's Chairs designs, builds, and sells unique ergonomic desk chairs for home and business. Their bestselling chair is the Spine Saver. Figure 7.32 illustrates how Channing could determine the break-even point in sales dollars using either the contribution margin per unit or the contribution margin ratio.

Sales Price per Unit	Cost per Unit	Contribution Margin per Unit	Fixed Costs	Fixed Costs/ Contribution Margin per Unit	Break-Even in Units	Break Even in Dollars
$1,250	$850	$400	$16,800	$16,800/$400	42	42 x $1,250 = $52,500

Contribution Margin per Unit ($1,250 – 850)	Contribution Margin Ratio (CM/Sales or $400 ÷ $1,250)	Break-Even in Sales Dollars (FC ÷ CM or $16,800 ÷ 0.32)	Break-Even in Units (Break Even Sales ÷ Unit Selling Price or $52,500 ÷ $1,250)
$400	32%	$52,500	42 Units

Figure 7.32 Channing's Break-Even Point *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Note that in either scenario, the break-even point is the same in dollars and units, regardless of approach. Thus, you can always find the break-even point (or a desired profit) in units and then convert it to sales by multiplying by the selling price per unit. Alternatively, you can find the break-even point in sales dollars and then find the number of units by dividing by the selling price per unit.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=337#oembed-1

YOUR TURN

College Creations

College Creations, Inc (CC), builds a loft that is easily adaptable to most dorm rooms or apartments and can be assembled into

a variety of configurations. Each loft is sold for $500, and the cost to produce one loft is $300, including all parts and labor. CC has fixed costs of $100,000.

A. What happens if CC produces nothing?
B. Now, assume CC produces and sells one unit (loft). What are their financial results?
C. Now, what do you think would happen if they produced and sold 501 units?
D. How many units would CC need to sell in order to break even?
E. How many units would CC need to sell if they wanted to have a pretax profit of $50,000?

Solution

A. If they produce nothing, they will still incur fixed costs of $100,000. They will suffer a net loss of $100,000.

B. If they sell one unit, they will have a net loss of $99,800.

Sales revenue	$ 500
Variable cost per unit	300
Contribution margin	200
Fixed costs	100,000
Operating income (loss)	$ (99,800)

Figure 7.33 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

C. If they produce 501 units, they will have operating income of $200 as shown:

Sales revenue (501 units at $500)	$250,500
Variable cost per unit (501 units at $300)	150,300
Contribution margin	100,200
Fixed costs	100,000
Operating income (loss)	$ 200

Figure 7.34 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

D. Break-even can be determined by FC ÷ CM per unit: $100,000 ÷ $200 = 500. Five hundred lofts must be sold to break even.

E. The desired profit can be treated like a fixed cost, and the target profit would be (FC + Desired Profit) ÷ CM or ($100,000 + $50,000) ÷ $200 = 750. Seven hundred fifty lofts need to be sold to reach a desired income of $50,000. Another way to have found this is to know that, after fixed costs are met, the $200 per unit contribution margin will go toward profit. The desired profit of $50,000 ÷ $200 per unit contribution margin = 250. This means that 250 additional units must be sold. To break even requires 500 units to be sold, and to reach the desired profit of $50,000 requires an additional 250 units, for a total of 750 units.

The Effects on Break-Even under Changing Business Conditions

Circumstances often change within a company, within an industry, or even within the economy that impact the decision-making of an organization. Sometimes, these effects are sudden and unexpected, for example, if a hurricane destroyed the factory of a company's major supplier; other times, they occur more slowly, such as when union negotiations affect your

labor costs. In either of these situations, costs to the company will be affected. Using CVP analysis, the company can predict how these changes will affect profits.

Changing a Single Variable

To demonstrate the effects of changing any one of these variables, consider Back Door Café, a small coffee shop that roasts its own beans to make espresso drinks and gourmet coffee. They also sell a variety of baked goods and T-shirts with their logo on them. They track their costs carefully and use CVP analysis to make sure that their sales cover their fixed costs and provide a reasonable level of profit for the owners.

Change in Sales Price

The owner of Back Door has one of her employees conduct a survey of the other coffee shops in the area and finds that they are charging $0.75 more for espresso drinks. As a result, the owner wants to determine what would happen to operating income if she increased her price by just $0.50 and sales remained constant, so she performs the following analysis:

Price Change Analysis		
	With Current Price	**With New Price**
Sales Price per Unit	$ 3.75	$ 4.25
Variable Cost per Unit	$ 1.50	$ 1.50
Contribution Margin per Unit	$ 2.25	$ 2.75
Fixed Costs	$2,475	$2,475
Break-even (in units)	1,100	900
Break-Even (in dollars)	$4,125	$3,825
Contribution Margin Income Statement Current Price versus New Price		
Unit Sales, Expected	1,500	1,500
Sales	$5,625	$6,375
Variable Costs	2,250	2,250
Contribution Margin	$3,375	$4,125
Fixed Costs	2,475	2,475
Net Income	$ 900	$1,650

Figure 7.35 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

The only variable that has changed is the $0.50 increase in the price of their espresso drinks, but the net operating income will increase by $750. Another way to think of this increase in income is that, if the sales price increases by $0.50 per expresso drink and the estimated sales are 1,500 units, then this will result in an increase in overall contribution margin of $750. Moreover, since all of the fixed costs were met by the lower sales price, all of this $750 goes to profit. Again, this is assuming the higher sales price does not decrease the number of units sold. Since the other coffee shops will still be priced higher than Back Door, the owner believes that there will not be a decrease in sales volume.

When making this adjustment to their sales price, Back Door Café is engaging in target pricing, a process in which a company uses market analysis and production information to determine the maximum price customers are willing to pay for a good or service in addition to the markup percentage.

If the good can be produced at a cost that allows both the desired profit percentage as well as deliver the good at a price acceptable to the customer, then the company should proceed with the product; otherwise, the company will not achieve its desired profit goals.

Change in Variable Cost

In March, the owner of Back Door receives a letter from her cups supplier informing her that there is a $0.05 price increase due to higher material prices. Assume that the example uses the original $3.75 per unit sales price. The owner wants to know what would happen to net operating income if she absorbs the cost increase, so she performs the following analysis:

Variable Cost Change Analysis		
	With Current Price	**With Increased Variable Cost**
Sales Price per Unit	$ 3.75	$ 3.75
Variable Cost per Unit	$ 1.50	$ 1.55
Contribution Margin per Unit	$ 2.25	$ 2.20
Fixed Costs	$2,475	$ 2,475
Break-even in Units	1,100	1,125
Break-even in Dollars	$4,125	$4,218.75
Monthly Contribution Margin Income Statement Current Variable Costs versus Increased Variable Costs		
Unit Sales, Expected	1,500	1,500
Sales	$5,625	$ 5,625
Variable Costs	2,250	2,325
Contribution Margin	$3,375	$ 3,300
Fixed Costs	2,475	2,475
Net Income	$ 900	$ 825

Figure 7.36 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

She is surprised to see that just a $0.05 increase in variable costs (cups) will reduce her net income by $75. The owner may decide that she is fine with the lower income, but if she wants to maintain her income, she will need to find a new cup supplier, reduce other costs, or pass the price increase on to her customers. Because the increase in the cost of the cups was a variable cost, the impact on net income can be seen by taking the increase in cost per unit, $0.05, and multiplying that by the units expected to be sold, 1,500, to see the impact on the contribution margin, which in this case would be a decrease of $75. This also means a decrease in net income of $75.

Change in Fixed Cost

Back Door Café's lease is coming up for renewal. The owner calls the landlord to indicate that she wants to renew her lease for another 5 years. The landlord is happy to hear she will continue renting from him but informs her that the rent will increase $225 per month. She is not certain that she can afford an additional $225 per month and tells him she needs to look at her numbers and will call him back. She pulls out her CVP spreadsheet and adjusts her monthly fixed costs upwards by $225. Assume that the example uses the original $3.75 per unit sales price. The results of her analysis of the impact of the rent increase on her annual net income are:

Fixed Cost Change Analysis		
	With Current Price	With Increased Fixed Cost
Sales Price per Unit	$ 3.75	$ 3.75
Variable Cost per Unit	$ 1.50	$ 1.50
Contribution Margin per Unit	$ 2.25	$ 2.25
Fixed Costs	$2,475	$2,700
Break-even in Units	1,100	1,200
Break-even in Dollars	$4,125	$4,500
Monthly Contribution Margin Income Statement Current Fixed Costs versus Increased Fixed Costs		
Unit Sales, Expected	1,500	1,500
Sales	$5,625	$5,625
Variable Costs	2,250	2,250
Contribution Margin	$3,375	$3,375
Fixed Costs	2,475	2,700
Net Income	$ 900	$ 675

Figure 7.37 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Because the rent increase is a change in a fixed cost, the contribution margin per unit remains the same. However, the break-even point in both units and dollars increase because more units of contribution are needed to cover the $225 monthly increase in fixed costs. If the owner of the Back Door agrees to the increase in rent for the new lease, she will likely look for ways to increase the contribution margin per unit to offset this increase in fixed costs.

In each of the prior examples, only one variable was changed—sales volume, variable costs, or fixed costs. There are some generalizations that can be made regarding how a change in any one of these variables affects the break-even point. These generalizations are summarized in Table 7.1.

Table 7.1 Generalizations Regarding Changes in Break-Even Point from a Change in One Variable By: Rice University OpenStax CC BY-NC-SA 4.0

Condition	Result
Sales Price Increases	Break-Even Point Decreases (Contribution Margin is Higher, Need Fewer Sales to Break Even)
Sales Price Decreases	Break-Even Point Increases (Contribution Margin is Lower, Need More Sales to Break Even)
Variable Costs Increase	Break-Even Point Increases (Contribution Margin is Lower, Need More Sales to Break Even)
Variable Costs Decrease	Break-Even Point Decreases (Contribution Margin is Higher, Need Fewer Sales to Break Even)
Fixed Costs Increase	Break-Even Point Increases (Contribution Margin Does Not Change, but Need More Sales to Meet Fixed Costs)
Fixed Costs Decrease	Break-Even Point Decreases (Contribution Margin Does Not Change, but Need Fewer Sales to Meet Fixed Costs)

Changing Multiple Variables

We have analyzed situations in which one variable changes, but often, more than one change will occur at a time. For example, a company may need to lower its selling price to compete, but they may also be able to lower certain variable costs by switching suppliers.

Suppose Back Door Café has the opportunity to purchase a new espresso machine that will reduce the amount of coffee beans required for an espresso drink by putting the beans under higher pressure. The new machine will cost $15,000, but it will decrease the variable cost per cup by $0.05. The owner wants to see what the effect will be on the net operating income and break-even point if she purchases the new machine. She has arranged financing for the new machine and the monthly payment will increase her fixed costs by $400 per

month. When she conducts this analysis, she gets the following results:

Variable Cost and Fixed Cost Change Analysis		
	With Current Price	**With Decreased VC and Increased FC**
Sales Price per Unit	$ 3.75	$ 3.75
Variable Cost per Unit	$ 1.50	$ 1.45
Contribution Margin per Unit	$ 2.25	$ 2.30
Fixed Costs	$ 2,475	$ 2,875
Break-even in Units	1,100	1,250
Break-even in Dollars	$4,125.00	$4,687.50
Monthly Contribution Margin Income Statement Current Fixed Costs versus Increased Fixed Costs		
Unit Sales, Expected	1,500	1,500
Sales	$ 5,625	$ 5,625
Variable Costs	2,250	2,175
Contribution Margin	$ 3,375	$ 3,450
Fixed Costs	2,475	2,875
Net Income	$ 900	$ 575

Figure 7.38 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Looking at the "what-if" analysis, we see that the contribution margin per unit increases because of the $0.05 reduction in variable cost per unit. As a result, she has a higher total contribution margin available to cover fixed expenses. This is good, because the monthly payment on the espresso machine represents an increased fixed cost. Even though the contribution margin ratio increases, it is not enough to totally offset the increase in fixed costs, and her monthly break-even point has risen from $4,125.00 to $4,687.50. If the new break-even point in units is a realistic number (within the relevant range), then she would decide to purchase the new machine because, once it has been paid for, her break-even point will fall and her net income will rise. Performing this analysis is an effective way for managers and business owners to look into

the future, so to speak, and see what impact business decisions will have on their financial position.

Let's look at another option the owner of the Back Door Café has to consider when making the decision about this new machine. What would happen if she purchased the new machine to realize the variable cost savings and also raised her price by just $0.20? She feels confident that such a small price increase will go virtually unnoticed by her customers but may help her offset the increase in fixed costs. She runs the analysis as follows:

Selling price, variable cost, and fixed cost change analysis			
	With Current Price	With decreased VC and increased FC	With increased SP, decreased VC, and increased FC
Sales price per unit	$ 3.75	$ 3.75	$ 3.95
Variable cost per unit	$ 1.50	$ 1.45	$ 1.45
Contribution margin per unit	$ 2.25	$ 2.30	$ 2.50
Fixed costs	$ 2,475	$ 2,875	$ 2,875
Break-even in units	1,100	1,250	1,150
Break-even in dollars	$4,125.00	$4,687.50	$4,542.50
Monthly contribution margin income statement			
Unit sales, expected	1,500	1,500	1,500
Sales	$ 5,625	$ 5,625	$ 5,925
Variable costs	2,250	2,175	2,175
Contribution margin	$ 3,375	$ 3,450	$ 3,750
Fixed costs	2,475	2,875	2,875
Net income	$ 900	$ 575	$ 875

Figure 7.39 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

The analysis shows the expected result: an increase in the per-unit contribution margin, a decrease in the break-even point, and an increase in the net operating income. She has changed three variables in her costs—sales price, variable cost, and fixed cost. In fact, the small price increase almost gets her back to

the net operating income she realized before the purchase of the new expresso machine.

By now, you should begin to understand why CVP analysis is such a powerful tool. The owner of Back Door Café can run an unlimited number of these what-if scenarios until she meets the financial goals for her company. There are very few tools in managerial accounting as powerful and meaningful as a cost-volume-profit analysis.

Long Descriptions

A graph of the Break-Even Point where “Dollars” is the y axis and “Units Sold” is the x axis. A line goes from the origin up and to the right and is labeled “Total Revenue.” Another line, labeled “Total Costs” goes up and to the right, starting at the y axis above the origin and is not as steep as the first line. There is a point where the two lines cross labeled “Break-Even Point.” The space between the lines to the left of that point is colored in and labeled “Loss.” The space between the lines to the right of that point is colored in and labeled “Profit.” Return

A graph of the Break-Even Point where “Dollars” is the y axis and “Birdbaths Sold” is the x axis. A line goes from the origin up and to the right and is labeled “Sales.” Another line, representing “Total Costs” goes up and to the right, starting at the y axis at $18,000 and is not as steep as the first line. There is a point where the two lines cross labeled “Break-Even Point.” There are dotted lines going at right angles from the breakeven point to both axes, showing the units sold are 225 and the cost is $22,500. The space between the lines to the left of that point is colored in and labeled “Loss.” The space between the lines to the right of that point is colored in and labeled “Profit.” Return

A graph of the Break-Even Point where “Dollars” is the y axis and “Birdbaths Sold” is the x axis. A line goes from the origin up and to the right and is labeled “Sales.” Another line,

representing “Total Costs” goes up and to the right, starting at the y axis at $18,000 and is not as steep as the first line. There is a point where the two lines cross labeled “Break-Even Point.” There are dotted lines going at right angles from the breakeven point to both axes showing the units sold are 225 and the cost is $22,500. There is also a dotted line at the point at 175 units level going up to the sales and costs lines with a point on each. A dotted line from each is going to the y axis crossing at $21,500 from the cost line and $17,500 from the sales line. The difference between these two points is the $4,000 loss. Return

A graph of the Break-Even Point where “Dollars” is the y axis and “Birdbaths Sold” is the x axis. A line goes from the origin up and to the right and is labeled “Sales.” Another line, representing “Total Costs” goes up and to the right, starting at the y axis at $18,000 and is not as steep as the first line. There is a point where the two lines cross labeled “Break-Even Point.” There are dotted lines going at right angles from the breakeven point to both axes showing the units sold are 225 and the cost is $22,500. There is also a dotted line going up from the units x axis at 300 units to both the cost and the sales lines. The points at which they cross have a dotted line going to the Y axis crossing at $24,000 from the cost point and $28,500 from the sales point. The difference between these two points represents the $6,000 profit. Return

Sales and profit relationships. Sales of 725 units × $100 per unit = $72,500, and variable costs of 725 units × $20 per unit = (14,500) for a contribution margin of $58,000. Fixed costs are (18,000), pre-tax profit is $40,000, and income tax expense of 40% is (16,000) for an after-tax profit of $24,000. Return

Sales Price per Unit $1,250, Cost per Unit $850, Contribution Margin per Unit $400, Fixed Costs $16,800, Fixed Cost divided by Contribution Margin per Unit $16,800 divided by $400, Break-Even in Units 42, Break Even in Dollars 42 times $1,250 equals $52,500, Contribution Margin Ratio (CM divided by Sales

or $400 divided by $1,250) 32 percent, Break-even in Sales Dollars (FC divided by CM or $16,800 divided by .32 equals $52,500, Break-Even in Units (Break Even Sales divided by Unit Selling Price or $42,500 divided by $1,250 equals 42 units. Return

Price Change Analysis: With Current Price, With New Price (respectively): Sales Price per Unit $3.75, $4.25; Variable Cost per Unit 1.50, 1.50; Contribution Margin per Unit $2.25, $2.75; Fixed Costs $2,475, $2,475; Break-even in Units 1,100, 900; Break-even in Dollars $4,125, $3,825. Contribution Margin Income Statement: Current Price, New Price (respectively): Unit Sales Expected 1,500, 1,500; Sales $5,625, $6,375; Variable Costs 2,250, 2,250; Contribution Margin $3,375, $4,125; Fixed Costs 2,475, 2,475; Net Income $900, $1,650. Return

Variable Cost Change Analysis: With Current Price, With Increased Variable Cost (respectively): Sales Price per Unit $3.75, $3.75; Variable Cost per Unit 1.50, 1.55; Contribution Margin per Unit $2.25, $2.20; Fixed Costs $2,475, $2,475; Break-even in Units 1,100, 1,125; Break-even in Dollars $4,125, $4,218.75. Monthly Contribution Margin Income Statement: Current Variable Cost, Increased Variable Costs (respectively): Unit Sales Expected 1,500, 1,500; Sales $5,625, $5,625; Variable Costs 2,250, 2,325; Contribution Margin $3,375, $3,300; Fixed Costs 2,475, 2,475; Net Income $900, $825. Return

Fixed Cost Change Analysis: With Current Price, With Increased Fixed Cost (respectively): Sales Price per Unit $3.75, $3.75; Variable Cost per Unit 1.50, 1.50; Contribution Margin per Unit $2.25, $2.25; Fixed Costs $2,475, $2,700; Break-even in Units 1,100, 1,200; Break-even in Dollars $4,125, $4,500. Monthly Contribution Margin Income Statement: Current Fixed Costs, Increased Fixed Costs (respectively): Unit Sales Expected 1,500, 1,500; Sales $5,625, $5,625; Variable Costs 2,250, 2,250; Contribution Margin $3,375, $3,375; Fixed Costs 2,475, 2,700; Net Income $900, $675. Return

Variable Cost and Fixed Cost Change Analysis: With Current

Price, With Decreased VC and Increased FC (respectively): Sales Price per Unit $3.75, $3.75; Variable Cost per Unit 1.50, 1.45; Contribution Margin per Unit $2.25, $2.30; Fixed Costs $2,475, $2,875; Break-even in Units 1,100, 1250; Break-even in Dollars $4,125, $4,687.50. Contribution Margin Income Statement: Current Fixed Costs, Increased Fixed Costs (respectively): Unit Sales Expected 1,500, 1,500; Sales $5,625, $5,625; Variable Costs 2,250, 2,175; Contribution Margin $3,375, $3,450; Fixed Costs 2,475, 2,875; Net Income $900, $575. Return

Selling Price, Variable Cost, and Fixed Cost Change Analysis: With Current Price, With Decreased VC and Increased FC, With Increased SP Decreased VC and Increased FC (respectively): Sales Price per Unit $3.75, $3.75, $3.95; Variable Cost per Unit 1.50, 1.45, 1.45; Contribution Margin per Unit $2.25, $2.30, $2.50; Fixed Costs $2,475, $2,875, $2,875; Break-even in Units 1,100, 1,250, 1,150; Break-even in Dollars $4,125, $4,687.50, $4,542.50. Contribution Margin Income Statement: With Current Price, With Decreased VC and Increased FC, With Increased SP Decreased VC and Increased FC (respectively): Unit Sales Expected 1,500, 1,500, 1,500; Sales $5,625, $5,625, 5,925; Variable Costs 2,250, 2,175, 2,175; Contribution Margin $3,375, $3,450, $3,750; Fixed Costs 2,475, 2,875, 2,875; Net Income $900, $575, 875. Return

7.3 Margin of Safety

Our discussion of CVP analysis has focused on the sales necessary to break even or to reach a desired profit, but two other concepts are useful regarding our break-even sales. Those concepts are margin of safety and operating leverage.

A company's margin of safety is the difference between its current sales and its break-even sales. The margin of safety tells the company how much they could lose in sales before the company begins to lose money, or, in other words, before the company falls below the break-even point. The higher the margin of safety is, the lower the risk is of not breaking even or incurring a loss. In order to calculate margin of safety, we use the following formula:

Margin of Safety in Dollars = Total Budgeted (or actual sales) – Break-Even Sales

Figure 7.40 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Let's look at Manteo Machine, a company that machines parts that are then sold and used in the manufacture of farm equipment. For their core product, the break-even analysis is as follows:

Sales Price per Unit	$	90
Variable Cost per Unit	$	40
Contribution Margin per Unit	$	50
Fixed Costs	$	85,000
Break-Even (in units)		1700
Contribution Margin per Unit	$	50
Selling Price per Unit	$	90
Contribution Margin Ratio		55.55%
Break-Even (in dollars, rounded)		$153,000

Figure 7.41 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Interpreting this information tells Manteo Machine that, when sales equal $153,000, they will be at the break-even point. However, as soon as sales fall below this figure, they will have negative net operating income. They have decided that they want a margin of safety of $10,000. They can add this as if it were a fixed cost (very much the same way we added target profit earlier) and then find a new break-even point that includes a $10,000 margin of safety. If they approached it from this perspective, their new break-even would appear as follows:

Sales Price per Unit	$	90
Variable Cost per Unit	$	40
Contribution Margin per Unit	$	50
Fixed Costs + Margin of Safety	$	95,000
Break-Even (in units)		1900
Contribution Margin per Unit	$	50
Selling Price per Unit	$	90
Contribution Margin Ratio		55.55%
Break-Even (in dollars, rounded)		$170,000

Figure 7.42 Manteo Machine's Margin of Safety *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

As shown in Figure 7.42, the margin of safety of 1,900 units is found from (FC + Margin of Safety) ÷ CM per unit = $95,000 ÷ $50. Thus, 1,900 units must be sold in order to meet fixed cost and have a $10,000 margin of safety. Another way to see this is to realize the $10,000 margin of safety will be met in $50 increments based on the current contribution margin. This means the company will need to sell an additional 200 units, which is an additional $18,000 in sales to have the desired margin of safety. The true break-even, where only fixed costs were met, was 1,700 units, or $153,000 in sales. The point at which the company would have a $10,000 margin of safety is 1,900 units, or $171,000 in sales. Note that the new level of units is the break-even units of 1,700 plus the 200 units for the margin of safety. The same can be seen for the sales dollar. The new level of desired sales dollars is the break-even sales of $153,000 plus the additional $18,000 in sales for the margin of safety.

The margin of safety can also be determined when a company knows its sales volume. For example, Manteo

Machine sold 2,500 units in March and wants to know its margin of safety at that sales volume:

Sales (at the current volume of 2,500 units)	$225,000
Break-Even Sales (1,900 units)	153,000
Margin of Safety (in dollars)	72,000

Figure 7.43 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

From this analysis, Manteo Machine knows that sales will have to decrease by $72,000 from their current level before they revert to break-even operations and are at risk to suffer a loss.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=347#oembed-1

Many companies prefer to consider the margin of safety as a percentage of sales, rather than as a dollar amount. In order to express margin of safety as a percentage, we divide the margin of safety (in dollars) by the total budgeted or actual sales volume. The formula to express margin of safety as a percentage is:

$$\text{Margin of Safety Percentage} = \frac{\text{Margin of Safety (dollars)}}{\text{Total Budget (or Actual) Sales (dollars)}}$$

Figure 7.44 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Previously, we calculated Manteo Machine's margin of safety as $72,000. As a percentage, it would be
$72,000$225,000=0.32or32%

This tells management that as long as sales do not decrease by more than 32%, they will not be operating at or near the break-even point, where they would run a higher risk of suffering a loss. Often, the margin of safety is determined when sales budgets and forecasts are made at the start of the fiscal year and also are regularly revisited during periods of operational and strategic planning.

Long Descriptions

Sales Price per Unit $90 less Variable Cost per Unit $40 equals Contribution Margin per Unit $50. Fixed Costs $85,000, Break-Even in units 1700. Contribution Margin per Unit $50 divided by Selling Price per Unit $90 equals Contribution Margin Ratio 55.55 percent, Break-Even in dollars, rounded $153,000. Return

Sales Price per Unit $90 less Variable Cost per Unit $40 equals Contribution Margin per Unit $50. Fixed Costs plus Margin of Safety $95,000, Break-Even in units 1900. Contribution Margin per Unit $50 divided by Selling Price per Unit $90 equals Contribution Margin Ratio 55.55 percent, Break-Even in dollars, rounded $170,000. Return

7.4 Operating Leverage

In much the same way that managers control the risk of incurring a net loss by watching their margin of safety, being aware of the company's operating leverage is critical to the financial well-being of the firm. Operating leverage is a measurement of how sensitive net operating income is to a percentage change in sales dollars. Typically, the higher the level of fixed costs, the higher the level of risk. However, as sales volumes increase, the payoff is typically greater with higher fixed costs than with higher variable costs. In other words, the higher the risk the greater the payoff.

First, let's look at this from a general example to understand payoff. Suppose you had $10,000 to invest and you were debating between putting that money in low risk bonds earning 3% or taking a chance and buying stock in a new company that currently is not profitable but has an innovative product that many analysts predict will take off and be the next "big thing." Obviously, there is more risk with buying the stock than with buying the bonds. If the company remains unprofitable, or fails, you stand to lose all or a portion of your investment ,whereas the bonds are less risky and will continue to pay 3% interest. However, the risk associated with the stock investment could result in a much higher payoff if the company is successful.

So how does this relate to fixed costs and companies? Companies have many types of fixed costs including salaries, insurance, and depreciation. These costs are present regardless of our production or sales levels. This makes fixed costs riskier than variable costs, which only occur if we produce and sell items or services. As we sell items, we have learned that the contribution margin first goes to meeting fixed costs and then

to profits. Here is an example of how changes in fixed costs affects profitability.

Gray Co. has the following income statement:

Sales (10,000 units x $10 SP)	$100,000
Variable Costs (10,000 units x $4 VC)	$ 40,000
Contribution Margin	$ 60,000
Fixed Costs	$ 25,000
Net Income	$ 35,000

Figure 7.45 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

What is the effect of switching $10,000 of fixed costs to variable costs? What is the effect of switching $10,000 of variable costs to fixed costs?

Effect of Changing $10,000 of FC to VC	
Sales (10,000 units x $10 SP)	$100,000
Variable Costs	50,000
Contribution Margin	50,000
Fixed Costs	15,000
Net Income	35,000

Effect of Changing $10,000 of VC to FC	
Sales (10,000 units x $10 SP)	$100,000
Variable Costs	30,000
Contribution Margin	70,000
Fixed Costs	35,000
Net Income	35,000

Figure 7.46 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Notice that in this instance, the company's net income stayed the same. Now, look at the effect on net income of changing fixed to variable costs or variable costs to fixed costs as sales volume increases. Assume sales volume increase by 10%.

Effect of Changing $10,000 of FC to VC and 10% Increase in Sales	
Sales (11,000 units x $10 SP)	$110,000
Variable Costs (also increases 10%)	$ 55,000
Contribution Margin	$ 55,000
Fixed Costs	$ 15,000
Net Income	$ 40,000

Effect of Changing $10,000 of VC to FC and 10% Increase in Sales	
Sales (11,000 units x $10 SP)	$110,000
Variable Costs (also increases 10%)	$ 33,000
Contribution Margin	$ 77,000
Fixed Costs	$ 35,000
Net Income	$ 45,000

Figure 7.47 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

As you can see from this example, moving variable costs to fixed costs, such as making hourly employees salaried, is riskier in that fixed costs are higher. However, the payoff, or resulting net income, is higher as sales volume increases.

This is why companies are so concerned with managing their fixed and variable costs and will sometimes move costs from one category to another to manage this risk. Some examples include, as previously mentioned, moving hourly employees (variable) to salaried employees (fixed), or replacing an employee (variable) with a machine (fixed). Keep in mind that managing this type of risk not only affects operating leverage but can have an effect on morale and corporate climate as well.

CONCEPTS IN PRACTICE

Fluctuating Operating Leverage: Why Do Stores Add Self-Service Checkout Lanes?

Operating leverage fluctuations result from changes in a company's cost structure. While any change in either variable or fixed costs will change operating leverage, the fluctuations most often result from management's decision to shift costs

from one category to another. As the next example shows, the advantage can be great when there is economic growth (increasing sales); however, the disadvantage can be just as great when there is economic decline (decreasing sales). This is the risk that must be managed when deciding how and when to cause operating leverage to fluctuate.

Consider the impact of reducing variable costs (fewer employee staffed checkout lanes) and increasing fixed costs (more self-service checkout lanes). A store with $125,000,000 per year in sales installs some self-service checkout lanes. This increases its fixed costs by 10% but reduces its variable costs by 5%. As Figure 7.48 shows, at the current sales level, this could produce a whopping 35% increase in net operating income. And, if the change results in higher sales, the increase in net operating income would be even more dramatic. Do the math and you will see that each 1% increase in sales would produce a 6% increase in net operating income: well worth the change, indeed.

	Without Self-service Checkout Lanes	With Self-service Checkout Lanes
Sales	$125,000	$125,000
Variable Costs	$ 93,750	$ 89,063
Contribution Margin	$ 31,250	$ 35,937
Fixed costs	$ 25,000	$ 27,500
Net Operating Income	$ 6,250	$ 8,437
% Increase in Income		35%

Figure 7.48 Impact of Self-Service Checkout Lanes *By: Rice University Source:OpenstaxCC BY-NC-SA 4.0*

(in 000s) Without Selfservice Checkout Lanes, With Selfservice

Checkout Lanes (respectively): Sales $125,000, 125,000; Variable Costs 93,750, 89,063; Contribution Margin 31,250, 35,938; Fixed Costs 25,000, 27,500; Net Operating Income 6,250 8,438; Percent Increase in Income 35 percent.

The company in this example also faces a downside risk, however. If customers disliked the change enough that sales decreased by more than 6%, net operating income would drop below the original level of $6,250 and could even become a loss.

Operating leverage has a multiplier effect. A multiplier effect is one in which a change in an input (such as variable cost per unit) by a certain percentage has a greater effect (a higher percentage effect) on the output (such as net income). To explain the concept of a multiplier effect, think of having to open a very large, heavy wooden crate. You could pull and pull with your hands all day and still not exert enough force to get it open. But, what if you used a lever in the form of a pry bar to multiply your effort and strength? For every additional amount of force you apply to the pry bar, a much larger amount of force is applied to the crate. Before you know it, you have the crate open. Operating leverage works much like that pry bar: if operating leverage is high, then a very small increase in sales can result in a large increase in net operating income.



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How does a company increase its operating leverage? Operating leverage is a function of cost structure, and companies that have a high proportion of fixed costs in their

cost structure have higher operating leverage. There is, however, a cautionary side to operating leverage. Since high operating leverage is the result of high fixed costs, if the market for the company's products, goods, or services shrinks, or if demand for the company's products, goods, or services declines, the company may find itself obligated to pay for fixed costs with little or no sales revenue to spare. Managers who have made the decision to chase large increases in net operating income through the use of operating leverage have found that, when market demand falls, their only recourse is to close their doors. In fact, many large companies are making the decision to shift costs *away* from fixed costs to protect them from this very problem.

Long Descriptions

Effect of Changing $10,000 of FC to VC: Sales (1,000 units times $10 SP) $100,000 less Variable Costs 50,000 equals Contribution Margin 50,000. Subtract Fixed Costs 15,000 to get Net Income of $35,000. Effect of Changing $10,000 of VC to FC: Sales (1,000 units times $10 SP) $100,000 less Variable Costs 30,000 equals Contribution Margin 70,000. Subtract Fixed Costs 35,000 to get Net Income of $35,000. Return

Effect of Changing $10,000 of FC to VC and 10 percent Increase in Sales: Sales (1,100 units times $10 SP) $110,000 less Variable Costs 55,000 equals Contribution Margin 55,000. Subtract Fixed Costs 15,000 to get Net Income of $40,000. Effect of Changing $10,000 of VC to FC and 10 percent Increase in Sales: Sales (1,100 units times $10 SP) $110,000 less Variable Costs 33,000 equals Contribution Margin 77,000. Subtract Fixed Costs 35,000 to get Net Income of $45,000. Return

7.5 Multi-product Breakeven Analysis

Up to this point in our CVP analysis, we have assumed that a company only sells one product, but we know that, realistically, this is not the case. Most companies operate in a multi-product environment, in which they sell different products, manufacture different products, or offer different types of services. Companies price each one of their products or services differently, and the costs associated with each of those products or services vary as well. In addition, companies have limited resources, such as time and labor, and must decide which products to sell or produce and in what quantities, or which services to offer in order to be the most profitable. These profitability considerations are often what contributes substance to a sales mix decision

In order to perform a break-even analysis for a company that sells multiple products or provides multiple services, it is important to understand the concept of a sales mix. A sales mix represents the relative proportions of the products that a company sells—in other words, the percentage of the company's total revenue that comes from product A, product B, product C, and so forth. Sales mix is important to business owners and managers because they seek to have a mix that maximizes profit, since not all products have the same profit margin. Companies can maximize their profits if they are able to achieve a sales mix that is heavy with high-margin products, goods, or services. If a company focuses on a sales mix heavy with low-margin items, overall company profitability will often suffer.

Performing a break-even analysis for these multi-product

businesses is more complex because each product has a different selling price, a different variable cost, and, ultimately, a different contribution margin. We must also proceed under the assumption that the sales mix remains constant; if it does change, the CVP analysis must be revised to reflect the change in sales mix. For the sake of clarity, we will also assume that all costs are companywide costs, and each product contributes toward covering these companywide costs.

Calculating Break-Even Analysis in a Multi-Product Environment

When a company sells more than one product or provides more than one service, break-even analysis is more complex because not all of the products sell for the same price or have the same costs associated with them: Each product has its own margin. Consequently, the break-even point in a multi-product environment depends on the mix of products sold. Further, when the mix of products changes, so does the break-even point. If demand shifts and customers purchase more low-margin products, then the break-even point rises. Conversely, if customers purchase more high-margin products, the break-even point falls. In fact, even if total sales dollars remain unchanged, the break-even point can change based on the sales mix. Let's look at an example of how break-even analysis works in a multi-product environment.

In multi-product CVP analysis, the company's sales mix is viewed as a composite unit, a selection of discrete products associated together in proportion to the sales mix. The composite unit is not sold to customers but is a concept used to calculate a combined contribution margin, which is then used to estimate the break-even point. Think of a composite unit as a virtual basket of fruit that contains the proportion

of individual fruits equal to the company's sales mix. If we purchased these items individually to make the fruit basket, each one would have a separate price and a different contribution margin. This is how a composite unit works in CVP analysis. We calculate the contribution margins of all of the component parts of the composite unit and then use the total to calculate the break-even point. It is important to note that fixed costs are allocated among the various components (products) that make up this composite unit. Should a product be eliminated from the composite unit or sales mix, the fixed costs must be re-allocated among the remaining products.

If we use the fruit basket as an example, we can look at the individual fruits that make up the basket: apples, oranges, bananas, and pears. We see that each individual fruit has a selling price and a cost. Each fruit has its own contribution margin. But how would we determine the contribution margin for a composite of fruit, or in other words, for our basket of fruit?

For our particular baskets, we will use 5 apples, 3 oranges, 2 bananas, and 1 pear. This means that our product mix is 5:3:2:1, as shown in Figure 7.49.

Fruit	Number of Units	Selling Price per Unit	Total Selling Price	Cost per Unit	Total Cost	Contribution Margin
Apple	5	$0.60	$3.00	$0.25	$1.25	$1.75
Orange	3	1.00	3.00	0.75	2.25	0.75
Banana	2	0.80	1.60	0.50	1.00	0.60
Pear	1	1.90	1.90	1.50	1.50	0.40
Total			$9.50		$6.00	$3.50

Figure 7.49 Contribution Margin Based on Product Mix *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Notice that the composite contribution margin is based on the number of units of each item that is included in the composite item. If we change the composition of the basket, then the composite contribution margin would change even though contribution margin of the individual items would not change.

For example, if we only include 4 apples, the contribution margin of a single apple is still $0.35, but the contribution margin of the apples in the basket is $1.40, not $1.75 as it is when 5 apples are included in the basket. Let's look at an additional example and see how we find the break-even point for a composite good.

We will consider West Brothers for an example of a multi-product break-even analysis. West Brothers manufactures and sells 3 types of house siding: restoration vinyl, architectural vinyl, and builder grade vinyl, each with its own sales price, variable cost, and contribution margin, as shown:

	Sales Price per Square Foot	Variable Cost per Square Foot
Builder Grade	$6.25	$3.25
Architectural	7.75	4.50
Restoration	9.25	6.25

Figure 7.50 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

The sales mix for West Brothers is 5 ft^2 of builder grade to 3 ft^2 of architectural grade to 2 ft^2 of restoration grade vinyl (a ratio of 5:3:2). This sales mix represents one composite unit, and the selling price of one composite unit is:

5 ft^2 of Builder Grade at $6.25	$31.25
3 ft^2 of Architectural at $7.75	23.25
2 ft^2 of Restoration at $9.25	18.50
Selling Price of 1 Composite Unit	$73.00

Figure 7.51 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

West Brothers' fixed costs are $145,000 per year, and the variable costs for one composite unit are:

5 ft^2 of Builder Grade at $3.25	$16.25
3 ft^2 of Architectural at $4.50	13.50
2 ft^2 of Restoration at $6.25	12.50
Variable Costs of 1 Composite Unit	$42.25

Figure 7.52 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

We will calculate the contribution margin of a composite unit for West Brothers using the same formula as before:

Selling Price per Composite Unit	**–**	**Variable Cost per Composite Unit**	**=**	**Contribution Margin per Composite Unit**

Figure 7.53 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Applying the formula, we determine that $73 – $42.25 = 30.75. We then use the contribution margin per composite unit to determine West Brothers' break-even point:

West Brothers will break even when it sells 4,715.45 (or 4,716 since it can't sell a partial unit) composite units. To determine how many of each product West Brothers needs to sell, we apply their sales mix ratio (5:3:2) to the break-even quantity as follows:

Builder Grade	5 × 4,715.45	23,577
Architectural	3 × 4,715.45	14,146
Restoration	2 × 4,715.45	9,431
Total Units		47,154

Figure 7.54 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

Using a forecasted or estimated contribution margin income statement, we can verify that the quantities listed will place West Brothers at break-even.

WEST BROTHERS Forecasted Contribution Margin Income Statement at Break-Even For Month Ended December 31, 2019	
Sales	
Builder grade (23,577 at $6.25)	$147,358
Architectural (14,146 at $7.75)	109,634
Restoration (9,431 at $9.25)	87,236
Total Sales	344,228
Variable Costs	
Builder Grade (23,577 at $3.25)	76,626
Architectural (14,146 at $4.50)	63,659
Restoration (9,431 at $9.25)	58,943
Total Variable Costs	199,228
Contribution Margin	145,000
Fixed Costs	145,000
Net Income	0

Figure 7.55 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

West Brothers can use this CVP analysis for a wide range of business decisions and for planning purposes. Remember, however, that if the sales mix changes from its current ratio, then the break-even point will change. For planning purposes, West Brothers can change the sales mix, sales price, or variable cost of one or more of the products in the composite unit and perform a "what-if" analysis.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=343#oembed-1

YOUR TURN

Margins in the Sales Mix

The sales mix of a company selling two products, A and B, is 3:1. The per-unit variable costs is $4 for Product A and $5 for Product B. Product A sells for $10 and product B sells for $9. Fixed costs for the company are $220,000.

A. What is the contribution margin per composite unit?
B. What is the break-even point in composite units?
C. How many units of product A and product B will the company sell at the break-even point?

Solution

A.

Product	Sales Price per Unit	Variable Cost per Unit	Contribution Margin per Unit
A	$10	$4	$6
B	9	5	4

Figure 7.56 *By: Rice University Source: Openstax CC BY-NC-SA 4.0*

B.

Product	Composite per Unit Sales (SP × mix)	Composite per Unit Variable Cost (VC × mix)	Composite per Unit Contribution Margin
A	$10 x 3 = $30	$4 × 3 = $12	$18
B	$ 9 x 1 = $ 9	$5 × 1 = $ 5	$4
	$39	$17	$22
Break-even point per composite unit = FC/composite CM 10,000 units - $220,000/$22			

Figure 7.57 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Break-even per composite unit = 15,385.

C.

Number of units per product (mix × units in one composite unit)		
A	3 × 10,000	30,000
B	1 × 10,000	10,000
Composite Sales (unit SP × product composite units)		
A	$10 × 30,000 units	$300,000
B	$ 9 × 10,000 units	$ 90,000
Total sales		$390,000
Composite Variable Cost unit VC × product composite units		
A	$4 × 30,000 units	$120,000
B	$5 × 10,000 units	$ 50,000
Total Variable Cost		$170,000
Contribution Margin (Sales – VC)		$220,000
Fixed Costs		$220,000
Net Income		$ 0

Figure 7.58 *By: Rice University Source: Openstax CC BY-NC-SA 4.0 Long Description*

Long Description

Fruit, Number of Units, Selling Price per Unit, Total Selling Price, Cost per Unit, Total Cost, Contribution Margin (respectively): Apple 5, $0.60, 3.00, 0.25, 1.25, 1.75; Orange 3, $1.00, 3.00, 0.75, 2.25, 0.75; Banana 2, $0.80, 1.60, 0.50, 1.00, 0.60; Pear 1, $1.90, 1.90, 1.50, 1.50, 0.40; Total –, –, $9.50, –, $6.00, $3.50. Return

West Brothers Forecasted Contribution Margin Income Statement at Break-Even Sales: Builder grade (23,577 at $6.25) $147,358, Architectural (14,146 at 7.75) 109,634, Restoration (9,431 at $9.25) 87,236; Total Sales 344,228; Variable Costs: Builder grade (23,577 at $3.25) 76,626, Architectural (14,146 at 4.50) 63,659, Restoration (9,431 at $6.25) 58,943; Total Variable Costs 199,228, Contribution Margin 145,000 less Fixed Costs 145,000 equals Net Income of 0. Return

Product: A, B; Composite per unit sales (SP times mix): $10 times 3 equals $30, 49 times 1 equals $9. Total equals $39. Composite per unit variable cost (VC times mix): $4 times 3

equals $12, $5 times 1 equals $5. Total equals $17. Composite per unit contribution margin: $18, $4. Total equals $22. Break-even point per composite unit equals FC divided by composite CM 10,000 units minus $220,000 divided by $22. Return

Number of units per product (mix times units in one composite unit): A, 3 times 10,000, 30,000; B, 1 times 10,000, 10,000. Composite sales (unit SP times product composite units): Product A $10 times 30,000 units, $30,000; Product B $9 times 10,000 units, $90,000; Total sales $390,000. Composite variable costs (unit VC times product composite units): Product A $4 times 30,000 units, $120,000; Product B $5 times 10,000 units, $50,000; Total variable cost $170,000. Contribution Margin (sales minus VC) $220,000. Fixed costs $220,000. Net Income $0. Return

CHAPTER 9- ACCOUNTING FOR OVERHEAD

Overhead

9.1 Traditional Overhead Allocation

Barry thinks of his education as a job and spends forty hours a week in class or studying. Barry estimates he has about eighty hours per week to allocate between school and other activities and believes everyone should follow his fifty-fifty rule of time allocation. His roommate, Kamil, disagrees with Barry and argues that allocating 50 percent of one's time to class and studying is not a great formula because everyone has different activities and responsibilities. Kamil points out, for example, that he has a job tutoring other students, is involved with student activities, and plays in a band, while Barry spends some of his nonstudy time doing volunteer work and working out.

Kamil plans each week based on how many hours he will need for each activity: classes, studying and coursework, tutoring, and practicing and performing with his band. In essence, he considers the details of each week's needs to budget his time. Kamil explains to Barry that being aware of the activities that consume his limited resources (time, in this example) helps him to better plan his week. He adds that individuals who have activities with lots of time commitments (class, work, study, exercise, family, friends, and so on) must be efficient with their time or they risk doing poorly in one or more areas. Kamil argues these individuals cannot simply assign a percentage of their time to each activity but should use each specific activity as the basis for allocating their time. Barry insists that assigning a set percentage to everything is easy and the better method. Who is correct?

Both roommates make valid points about allocating limited

resources. Ultimately, each must decide which method to use to allocate time, and they can make that decision based on their own analyses. Similarly, businesses and other organizations must create an allocation system for assigning limited resources, such as overhead. Whereas Kamil and Barry are discussing the allocation of hours, the issue of allocating costs raises similar questions. For example, for a manufacturer allocating maintenance costs, which are an overhead cost, is it better to allocate to each production department equally by the number of machines that need to be maintained or by the square footage of space that needs to be maintained?

In the past, overhead costs were typically allocated based on factors such as total direct labor hours, total direct labor costs, or total machine hours. This allocation process, often called the traditional allocation method, works most effectively when direct labor is a dominant component in production. However, many industries have evolved, primarily due to changes in technology, and their production processes have become more complicated, with more steps or components. Many of these industries have significantly reduced their use of direct labor and replaced it with technology, such as robotics or other machinery. For example, a mobile phone production facility in China replaced 90 percent of its workforce with robots.[1]

In these situations, a direct cost (labor) has been replaced by an overhead cost (e.g., depreciation on equipment). Because of this decrease in reliance on labor and/or changes in the types of production complexity and methods, the traditional method of overhead allocation becomes less effective in certain production environments. To account for these changes in technology and production, many organizations today have adopted an overhead allocation method known as activity-based costing (ABC). This chapter will explain the transition to ABC and provide a foundation in its mechanics.

Activity-based costing is an accounting method that recognizes the relationship between product costs and a

production activity, such as the number of hours of engineering or design activity, the costs of the set up or preparation for the production of different products, or the costs of packaging different products after the production process is completed. Overhead costs are then allocated to production according to the use of that activity, such as the number of machine setups needed. In contrast, the traditional allocation method commonly uses cost drivers, such as direct labor or machine hours, as the single activity.

Because of the use of multiple activities as cost drivers, ABC costing has advantages over the traditional allocation method, which assigns overhead using a single predetermined overhead rate. Those advantages come at a cost, both in resources and time, since additional information needs to be collected and analyzed. **Chrysler**, for instance, shifted its overhead allocation to ABC in 1991 and estimates that the benefits of cost savings, product improvement, and elimination of inefficiencies have been ten to twenty times greater than the investment in the program at some sites. It believes other sites experienced savings of fifty to one hundred times the cost to implement the system.[2]

As you've learned, understanding the cost needed to manufacture a product is critical to making many management decisions (Figure 9.1). Knowing the total and component costs of the product is necessary for price setting and for measuring the efficiency and effectiveness of the organization. Remember that product costs consist of direct materials, direct labor, and manufacturing overhead. It is relatively simple to understand each product's direct material and direct labor cost, but it is more complicated to determine the overhead component of each product's costs because there are a number of indirect and other costs to consider. A company's manufacturing overhead costs are all costs other than direct material, direct labor, or selling and administrative costs. Once a company has determined the overhead, it must

establish how to allocate the cost. This allocation can come in the form of the traditional overhead allocation method or activity-based costing..

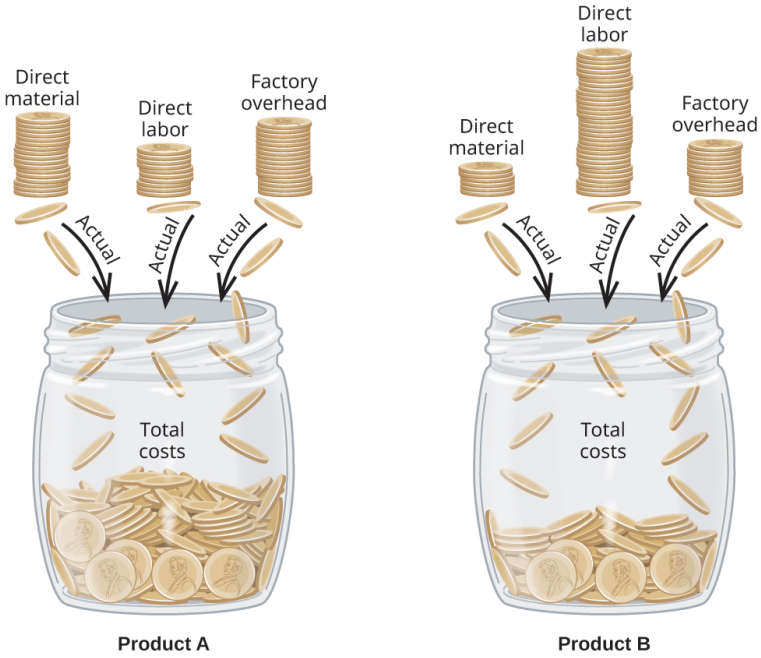


Figure 9.1 Allocating Costs among Products *The total cost of a product is based on direct labor, direct material, and factory overhead costs. By: Rice University OpenStax CC BY-NC-SA 4.0*

Component Categories under Traditional Allocation

Traditional allocation involves the allocation of factory overhead to products based on the volume of production resources consumed, such as the amount of direct labor hours consumed, direct labor cost, or machine hours used. In order to perform the traditional method, it is also important to

understand each of the involved cost components: direct materials, direct labor, and manufacturing overhead. Direct materials and direct labor are cost categories that are relatively easy to trace to a product. Direct material comprises the supplies used in manufacturing that can be traced directly to the product. Direct labor is the work used in manufacturing that can be directly traced to the product. Although the processes for tracing the costs differ, both job order costing and process costing trace the material and labor through materials requisition requests and time cards or electronic mechanisms for measuring labor input. Job order costing traces the costs directly to the product, and process costing traces the costs to the manufacturing department.

Estimated Total Manufacturing Overhead Costs

The more challenging product component to track is manufacturing overhead. Overhead consists of indirect materials, indirect labor, and other costs closely associated with the manufacturing process but not tied to a specific product. Examples of other overhead costs include such items as depreciation on the factory machinery and insurance on the factory building. Indirect material comprises the supplies used in production that cannot be traced to an individual product, and indirect labor is the work done by employees not directly involved in the manufacturing process, such as the supervisors' salaries or the maintenance staff's wages. Because these costs cannot be traced directly to the product like direct costs are, they have to be allocated among all of the products produced and added, or applied, to the production and product cost.

For example, the recipe for shea butter has easily identifiable quantities of shea nuts and other ingredients. Based on the

manufacturing process, it is also easy to determine the direct labor cost. But determining the exact overhead costs is not easy, as the cost of electricity needed to dry, crush, and roast the nuts changes depending on the moisture content of the nuts upon arrival.

Until now, you have learned to apply overhead to production based on a predetermined overhead rate typically using an activity base. An activity base is considered to be a primary driver of overhead costs, and traditionally, direct labor hours or machine hours were used for it. For example, a production facility that is fairly labor intensive would likely determine that the more labor hours worked, the higher the overhead will be. As a result, management would likely view labor hours as the activity base when applying overhead costs.

A predetermined overhead rate is calculated at the start of the accounting period by dividing the estimated manufacturing overhead by the estimated activity base. The predetermined overhead rate is then applied to production to facilitate determining a standard cost for a product. This estimated overhead rate will allow a company to determine a cost for the product without having to wait, possibly several months, until all of the actual overhead costs are determined, and to help with issues such as seasonal production or variable overhead costs, such as utilities.

Calculation of Predetermined Overhead and Total Cost under Traditional Allocation

The predetermined overhead rate is set at the beginning of the year and is calculated as the estimated (budgeted) overhead costs for the year divided by the estimated (budgeted) level of activity for the year. This activity base is often direct labor hours, direct labor costs, or machine hours. Once a company

determines the overhead rate, it determines the overhead rate per unit and adds the overhead per unit cost to the direct material and direct labor costs for the product to find the total cost.

$$\text{Predetermined Overhead Rate} = \frac{\text{Estimated Overhead Cost (\$)}}{\text{Estimated Activity Base (units or \$)}}$$

Figure 9.2 *By: Rice University Openstax CC BY NC SA*

To put this method into context, consider this example. Musicality Manufacturing developed a recording device similar to a microphone that allows musicians and music aficionados to record their playing or singing along with any song publicly available. There are three products that vary in features and ability: Solo, Band, and Orchestra. Musicality was started by musicians who majored in math and software engineering while in college. Their main concern was building a quality manufacturing plant, so they used the simpler traditional allocation method. They started by determining their direct costs, which are shown in Figure 9.3.

	Solo	Band	Orchestra
Direct Materials per Unit	$ 3.50	$6.00	$11.70
Direct Labor Cost per Unit	10.00	2.75	4.30

Figure 9.3 Material and Labor Costs for Musicality *By: Rice University OpenStax CC BY-NC-SA 4.0*

Musicality determines the overhead rate based on direct labor hours. At the beginning of the year, the company estimates total overhead costs to be $2,500,000 and total direct labor hours to be 1,250,000. The predetermined overhead rate is

Musicality uses this information to determine the cost of each product. For example, the total direct labor hours estimated for the solo product is 350,000 direct labor hours. With $2.00 of overhead per direct hour, the Solo product is estimated to have $700,000 of overhead applied. When the $700,000 of overhead applied is divided by the estimated production of 140,000 units of the Solo product, the estimated overhead per product for the Solo product is $5.00 per unit. The computation of the overhead cost per unit for all of the products is shown in Figure 9.4.

	Solo	Band	Orchestra	Total
Direct Labor Hours per Product	350,000	400,000	500,000	1,250,000
Overhead Rate per Direct Labor Hour	× $2	× $2	× $2	× $2
Overhead Assign per Product	$700,000	$800,000	$1,000,000	$2,500,000
Number Units	140,000	100,000	250,000	490,000
Overhead per Unit	$ 5	$ 8	$ 4	

Figure 9.4 Musicality's Overhead per Unit Using Traditional Allocation. *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

The overhead cost per unit from Figure 9.4 is combined with the direct material and direct labor costs as shown in Figure 9.3 to compute the total cost per unit as shown in Figure 9.5.

	Solo	Band	Orchestra
Direct Materials per Unit	$ 3.50	$ 6.00	$11.70
Direct Labor per Unit	10.00	2.75	4.30
Overhead per Unit	$ 5.00	$ 8.00	$ 4.00
Cost per Unit	$18.50	$16.75	$20.00

Figure 9.5 Musicality's Product Costs Using Traditional Allocation. *By: Rice University OpenStax CC BY-NC-SA 4.0*

After reviewing the product cost and consulting with the marketing department, the sales prices were set. The sales

price, cost of each product, and resulting gross profit are shown in Figure 9.6.

	Solo	Band	Orchestra
Sales Price	$20.00	$25.00	$30.00
Cost per Unit (traditional)	18.50	16.75	20.00
Gross Profit per Unit	$ 1.50	$ 8.25	$10.00

Figure 9.6 Musicality's Gross Profit per Unit Using Traditional Allocation *By: Rice University OpenStax CC BY-NC-SA 4.0*

Sales of each product have been strong, and the total gross profit for each product is shown in Figure 9.7. Using the Solo product as an example, 150,000 units are sold at a price of $20 per unit resulting in sales of $3,000,000. The cost of goods sold consists of direct materials of $3.50 per unit, direct labor of $10 per unit, and manufacturing overhead of $5.00 per unit. With 150,000 units, the direct material cost is $525,000; the direct labor cost is $1,500,000; and the manufacturing overhead applied is $750,000 for a total Cost of Goods Sold of $2,775,000. The resulting Gross Profit is $225,000 or $1.50 per unit.

Traditional Costing	Solo	Band	Orchestra	Total
Number of Units Sold	150,000	110,000	200,000	460,000
Sales	$3,000,000	$2,750,000	$6,000,000	$11,750,000
Less Cost of Goods Sold				
Direct Material	525,000	660,000	2,340,000	3,525,000
Direct Labor	1,500,000	302,500	860,000	2,662,500
Manufacturing Overhead	750,000	880,000	800,000	2,430,000
Cost of Goods Sold	2,775,000	1,842,500	4,000,000	8,617,500
Gross Profit	$ 225,000	$ 907,500	$2,000,000	$ 3,132,500

Figure 9.7 Musicality's Gross Profit by Product Line Using Traditional Allocation *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Long Descriptions

Computation of overhead per unit for Solo, Band, Orchestra, and total, respectively. Direct Labor Hours per Product: 350,000, 400,000, 500,000, 1,250,000. Times Overhead Rate per Direct Labor Hour: $2.00 for all columns. Equals Overhead Assigned per Product: $700,000, $800,000, $1,000,000, $2,500,000. Divide by the Number of Units: 140,000, 100,000, 250,000, 490,000. Equals Overhead per Unit: $5, $8, $4. Return

Calculation of Total Gross Profit for Solo, Band, Orchestra, and Total, respectively. Number of Units Sold: 150,000, 110,000, 200,000, 460,000. Sales: $3,000,000, $2,750,000, $6,000,000, $11,750,000. Less Cost of Goods Sold. Direct Material: 525,000, 660,000, 2,340,000, 3,525,000. Direct Labor: 1,500,000, 302,500, 860,000, 2,662,500. Manufacturing Overhead: 750,000, 880,000, 800,000, 2,430,000. Cost of Goods Sold: 2,775,000, 1,842,500, 4,000,000, 8,617,500. Gross Profit: $225,000, $907,500, $2,000,000, $3,132,500. Return

Footnotes

- 1 June Javelosa and Kristin Houser. “This Company Replaced 90% of Its Workforce with Machines. Here’s What Happened.” *Futurism / World Economic Forum*. https://www.weforum.org/agenda/2017/02/after-replacing-90-of-employees-with-robots-this-companys-productivity-soared
- 2 Joseph H. Ness and Thomas G. Cucuzza. “Tapping the Full Potential of ABC.” *Harvard Business Review*. July-Aug. 1995. https://hbr.org/1995/07/tapping-the-full-potential-of-abc

9.2 Cost Drivers

As you've learned, the most common bases for predetermined overhead are direct labor hours, direct labor dollars, or machine hours. Each of these costs is considered a cost driver because of the causal relationship between the base and the related costs: As the cost driver's usage increases, the cost of overhead increases as well. Table 9.1 shows various costs and potential cost drivers.

Table 9.1 Common Manufacturing Expenses and Potential Cost Drivers By: Rice University OpenStax CC BY-NC-SA 4.0

Common Expenses	Potential Cost Drivers
• Customer Service • Cleaning Equipment Costs • Marketing Expenses • Office Supplies • Green Floral Tape (indirect material) • Website Maintenance Expense	• Number of product returns from customers • Number of square feet • Number of customer contacts • Number of employees • Number of customer orders • Number of customer online orders

The more accurately a company can determine the cost drivers for its products, the more accurate the costing information will be, which in turn allows management to make better use of the cost data in making decisions. As technology changes, however, the mix between materials, labor, and overhead changes. Often, improved technology means less waste of material and fewer direct labor hours, but possibly more overhead. For example, technology has changed the way pharmaceuticals are manufactured. Advancing technology allows for the now smaller labor force to be more productive than a larger labor force from earlier years. While the labor cost has changed, this decrease may only be temporary as a labor

force with higher costs and different skills is often needed. Additionally, an increase in technology often raises overhead costs. How accurate, then, is the company's product cost information if it has become more efficient in its production process? Should the company still be using a predetermined overhead application rate based on direct labor hours or machine hours? A detailed analysis of the cost drivers will answer these questions.

Another benefit of looking at cost drivers is that doing so allows a company to analyze all costs. A company can differentiate among costs that drive overhead and have value, those that do not drive overhead but still add value, and those that may or may not drive the overhead but do not add any value. For example, a furniture manufacturer produces and sells wooden tables in various colors. The painting process involves a white base coat, a color coat, and a clear protective top coat. The three coats are applied in a sealed room using a spraying process followed by an ultraviolet drying process. The depreciation on the spraying machines and the ultraviolet bulbs used in the painting process are overhead costs. These costs drive or increase overhead, and they add value to the product by increasing the quality. Costs associated with repainting or fixing any blemishes are overhead costs that are necessary to sell the product but would not be considered value-added costs. The goal is to eliminate as many of the non-value-added costs as possible and subsequently reduce overhead costs.

Cost Drivers and Overhead

In today's production environment, there are many activities within the production process that can contribute to the cost of the product, but determining the cost drivers may be complicated because some of those activities may change over

time. Additionally, the appropriate level of assigning cost drivers needs to be determined. In some cases, overhead costs such as inspection increase with each unit inspected, and the costs need to be allocated on a per-unit level. In other cases, the overhead costs, such as machine setup costs, are incurred each time a batch of products is manufactured and need to be allocated at the batch level.

For example, the labor hours for the staff taking, fulfilling, and inspecting orders may increase as the number of orders increases, driving up the overhead. Furthermore, the costs of taking orders or of quality inspections can vary per product and may not be captured properly. Technology improvements, including switching to automated processes for production, may decrease the labor hours of the production staff, driving the labor-related overhead downward but potentially increasing other overhead expenses. These activities—order taking, fulfillment, and quality inspections—are potential cost drivers associated with production, and they each drive the overhead at varying rates.

Identify Cost Drivers

How does a company determine its cost drivers for indirect materials, indirect labor, and other overhead costs? To begin the determination of appropriate cost drivers, an accountant analyzes the activities in the product production process that contribute to the cost of that product. An activity is any action that consumes company resources, such as taking orders for a product, setting up machines to produce the product, inspecting the product, and providing customer support before and through the order process. For example, Musicality's direct costs can be traced to the products, but there are indirect costs associated with using various types of material for each product. While the Orchestra product has more

intricate materials and labor, it has fewer costs associated with requisitioning and conveying materials to the production line than the other products have. Additionally, examining the inspection costs indicates the Orchestra product is a simple product to inspect, so random quality inspections are sufficient. But individual inspections for both the Solo and Band products are critical, and the overhead related to inspection costs should be based on the number of inspections.

As you can imagine, the unique aspects of the production process for each product affect the overhead cost of each product. However, these costs may not be allocated to the products appropriately when overhead is applied using a predetermined rate based on one activity. While Solo, Band, and Orchestra might appear to be different only in quality, they are actually very different from each other when it comes to manufacturing overhead costs.

Whether the products produced require significantly different overhead resources or not, the company benefits from understanding what its cost drivers are. The more efficiently each product's activities are tracked, the more actual cost drivers are discovered, and the more accurately overhead can be assigned to each product.

CONCEPTS IN PRACTICE

Cost Drivers for Small Businesses

The value of analyzing cost drivers can be used in budgeting beyond allocating overhead to products. **American Express** has forums designed to help small businesses be successful. Knowing the cost drivers for your business can help

with budgeting. American Express states that all business activities are related to five main cost drivers:[3]

- Employee head count is often the driver for office supply expense.
- Salesperson head count is often the driver for auto and other employee travel expense.
- The number of leads required to reach the target sales goal is often the driver for advertising, public relations, social media, search engine optimization expense, and other expenses associated with generating leads.
- Sales and all related variable expenses are often the driver for commissions, bad debt, insurance expense, and so on.
- Fixed costs, such as postage, web hosting fees, business licenses, and banking fees, are often overlooked as cost drivers.

Footnotes

- 3 American Express. "5 Cost Drivers to Help You Make Accurate Expense Projections." June 23, 2011. https://www.americanexpress.com/us/small-business/openforum/articles/5-cost-drivers-to-help-you-make-accurate-expense-projections/

9.3 Activity-based Costing

As technology changes the ratio between direct labor and overhead, more overhead costs are linked to drivers other than direct labor and machine hours. This shift in costs gives companies the opportunity to stop using the traditional single predetermined overhead rate applied to all units of production and instead use an overhead allocation approach based on the actual activities that drive overhead. Making this change allows management to obtain more accurate product cost information, which leads to more informed decisions. Activity-based costing (ABC) is the process that assigns overhead to products based on the various activities that drive overhead costs.

Historical Perspective on Determination of Manufacturing Overhead Allocation

All products consist of material, labor, and overhead, and the major cost components have historically been materials and labor. Manufacturing overhead was not a large cost of the product, so an overhead allocation method based on labor or machine hours was logical. For example, as shown in Figure 9.3, Musicality determined the direct costs and direct labor for their three products: Solo, Band, and Orchestra. Under the traditional method of costing, the predetermined overhead rate of $2 per direct labor hour was computed by dividing the estimated overhead by the estimated direct labor hours. Based on the number of direct labor hours and the number of units

produced for each product, the overhead per product is shown in Figure 9.4.

As technology costs decreased and production methods became more efficient, overhead costs changed and became a much larger component of product costs. For many companies, and in many cases, overhead costs are now significantly larger than labor costs. For example, in the last few years, many industries have increased technology, and the amount of overhead has doubled.[4] Technology has changed the manufacturing labor force, and therefore, the type and cost of labor associated with those jobs have changed. In addition, technology has made it easier to track the various activities and their related overhead costs.

Many manufacturing companies use MRP (material requirements planning) or ERP (enterprise resource planning) systems. MRP helps management organize the planning, scheduling, and tracking of materials while ERP systems help plan, organize, and track the materials as well as the accounting, marketing, supply chain, and other management functions.

Figure 9.8 *By: Rice University OpenStax CC BY NC SA 4.0 Long Description*

Costs can be gathered on a unit level, batch level, product level, or factory level. The idea behind these various levels is that at each level, there are additional costs that are encountered, so a company must decide at which level or levels it is best for the company to accumulate costs. A unit-level cost is incurred each time a unit of product is produced and includes costs such as materials and labor. A batch-level cost is incurred every time a batch of items is manufactured, for example, costs associated with purchasing and receiving materials. A product-level cost is incurred each time a product is produced and includes costs such as engineering costs, testing costs, or quality control costs. A factory-level cost is incurred because products are being produced and includes costs such as the plant supervisor's salary and rent on the factory building. By

definition, indirect labor is not traced to individual products. However, it is possible to track some indirect labor to several jobs or batches. A similar amount of information can be derived for indirect material. An example of an indirect material in some manufacturing processes is cleaning solution. For example, one type of cleaning solution is used in the manufacturing of pop sockets. It is not practical to measure every ounce of cleaning solution used in the manufacture of an individual pop socket; rather, it makes sense to allocate to a particular batch of pop sockets the cost of the cleaning solution needed to make that batch. Likewise, a manufacturer of frozen french fries uses a different type of solution to clean potatoes prior to making the french fries and would allocate the cost of the solution based on how much is used to make each batch of fries.
https://youtu.be/EMO2zZbrO0w

Establishing an Activity-Based Costing System

ABC is a five-stage process that allocates overhead more precisely than traditional allocation does by applying it to the products that use those activities. ABC works best in complex processes where the expenses are not driven by a single cost driver. Instead, several cost drivers are used as the overhead costs are analyzed and grouped into activities, and each activity is allocated based on each group's cost driver. The five stages of the ABC process are:

1. Identify the activities performed in the organization
2. Determine activity cost pools
3. Calculate activity rates for each cost pool
4. Allocate activity rates to products (or services)
5. Calculate unit product costs

The first step is to identify activities needed for production. An activity is an action or process involved in the production of inventory. There can be many activities that consume resources, and management will need to narrow down the activities to those that have the biggest impact on overhead costs. Examples of these activities include:

- Taking orders
- Setting up machines
- Purchasing material
- Assembling products
- Inspecting products
- Providing customer service

The second step is assigning overhead costs to the identified activities. In this step, overhead costs are assigned to each of the activities to become a cost pool. A cost pool is a list of costs incurred when related activities are performed. Table 9.2 illustrates the various cost pools along with their activities and related costs.

Table 9.2 Cost Pools and Their Activities and Related Costs By: Rice University OpenStax CC BY-NC-SA 4.0

Cost Pool	Activities and Related Costs
Production	• Indirect labor setting up machines • Indirect labor cost of accepting and verifying orders • Machine maintenance costs • Costs to operate the machine: utilities, insurance, etc.
Purchasing material	• Preparing purchase requisitions for the material • Cost to move material from receiving department into production • Depreciation of equipment used to move material
Inspect products	• Inspection supervisor costs • Cost to move product to and from the inspection area
Assemble products	• Cost of assembly machine • Cost of label machine • Cost of labels
Technological production	• Website maintenance • Depreciation of computers

For example, the production cost pool consists of costs such as indirect labor for those accepting the order, verifying the customer has credit to pay for the order, maintenance and depreciation on the machines used to produce the orders, and utilities and rent for operating the machines. Figure 9.1 illustrates how the costs in each pool are allocated to each product in a different proportion.

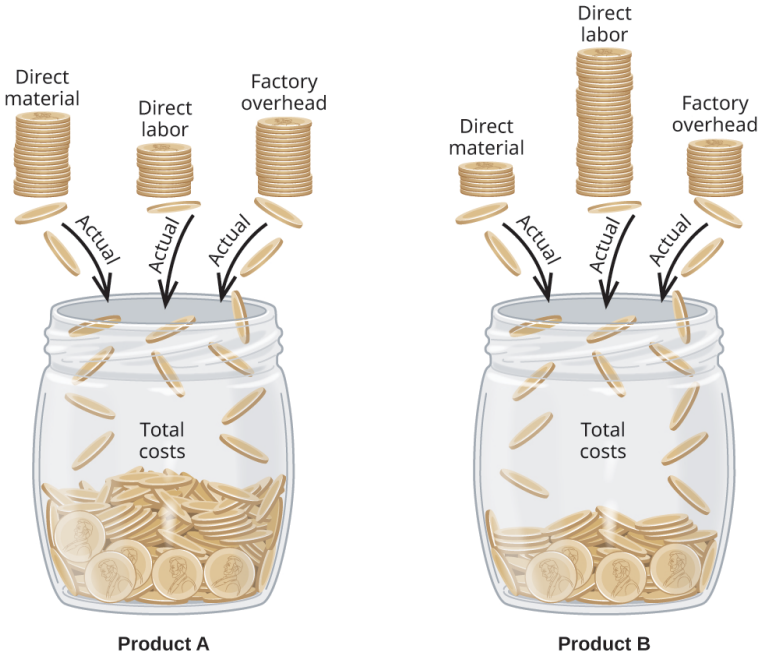


Figure 9.1 Allocating Overhead by Cost Pool *By: Rice University* *OpenStax CC BY-NC-SA 4.0*

Once the costs are grouped into similar cost pools, the activities in each pool are analyzed to determine which activity "drives" the costs in that pool, leading to the third step of ABC: identify the cost driver for each cost pool and estimate an annual level of activity for each cost driver. As you've learned, the cost driver is the specific activity that drives the costs in the cost pools. Table 9.3 shows some activities and cost drivers for those activities.

Table 9.3 Activities and Their Common Cost Drivers By: Rice University OpenStax CC BY-NC-SA 4.0

Cost Pool	Cost Driver
Customer order	Number of orders
Production	Machine setups
Purchasing materials	Purchase requisitions
Assembling products	Direct labor hours
Inspecting products	Inspection hours
Customer service	Number of contacts with customer

The fourth step is to compute the predetermined overhead rate for each of the cost drivers. This portion of the process is similar to finding the traditional predetermined overhead rate, where the overhead rate is divided by direct labor dollars, direct labor hours, or machine hours. Each cost driver will have its own overhead rate, which is why ABC is a more accurate method of allocating overhead.

Finally, step five is to allocate the overhead costs to each product. The predetermined overhead rate found in step four is applied to the actual level of the cost driver used by each product. As with the traditional overhead allocation method, the actual overhead costs are accumulated in an account called manufacturing overhead and then applied to each of the products in this step.

Notice that steps one through three represent the process of allocating overhead costs to activities, and steps four and five represent the process of allocating the overhead costs that have been assigned to activities to the products to which they pertain. Thus, the five steps of ABC involve two major processes: first, allocating overhead costs to the various activities to get a cost per activity, and then allocating the cost per activity to each product based on that product's usage of the activities.

Now that the steps involved have been detailed, let's demonstrate the calculations using the Musicality example.

YOUR TURN

Comparing Estimates to Actual Costs

A company has determined that its estimated 500,000 machine hours is the optimal driver for its estimated $1,000,000 machine overhead cost pool. The $750,000 in the material overhead cost pool should be allocated using the estimated 15,000 material requisition requests. How much is over- or underapplied if there were actually 490,000 machine hours and 15,500 material requisitions that resulted in $950,000 in the machine overhead cost pool, and $780,000 in the material cost pool? What does this difference indicate?

Solution

The predetermined overhead rate is $2 per machine hour ($1,000,000 ÷ 500,000 machine hours) and $50 per material requisition ($750,000 ÷ 15,000 requisitions). The actual and applied overhead can then be calculated to determine whether it is over- or underapplied:

	Rate	Actual	Applied	Difference	Overapplied or Underapplied?
Machine Overhead	$ 2*	490,000*	$980,000	$30,000	Overapplied
Material Overhead	$50**	15,500**	$775,000	$(5,000)	Underapplied

* machine hours
**requisitions

Figure 9.9 *By: Rice University Openstax CC BY NC SA Long Description*

The difference is a combination of factors. There were fewer machine hours than estimated, but there was also less

overhead than estimated. There were more requisitions than estimated, and there was also more overhead.

The Calculation of Product Costs Using the Activity-Based Costing Allocation Method

Musicality is considering switching to an activity-based costing approach for determining overhead and has collected data to help them decide which overhead allocation method they should use. Performing the analysis requires these steps:

1. Identify cost pools necessary to complete the product. Musicality determined its cost pools are:

    - Setting up machines
    - Purchasing material
    - Inspecting products
    - Assembling products
    - Technological production

2. Assign overhead cost to the cost pools. Musicality has estimated the overhead for each cost pool to be:

Activity	Estimated Overhead Costs
Setting Up Machines	$ 200,000
Purchasing Material	500,000
Inspecting Products	300,000
Assembling Products	600,000
Technological Production	900,000
Total	$2,500,000

Figure 9.10 *By: Rice University Openstax CC BY NC SA*

3. Identify the cost driver for each activity, and estimate an annual activity for each driver. Musicality determined the driver and estimated activity for each product to be the following:

	Expected Cost Driver Activities			
Cost Driver	Solo	Band	Orchestra	Total
Machine Setups	2,000	1,500	1,500	5,000
Number of Purchase Requisitions	5,000	4,000	1,000	10,000
Inspection Hours	10,000	9,000	1,000	20,000
Number of Parts Requiring Labor	15,000	3,000	12,000	30,000
Machine Hours	80,000	60,000	10,000	150,000

Figure 9.11 *By: Rice University Openstax CC BY NC SA Long Description*

4. Compute the predetermined overhead for each cost driver. Musicality determined this predetermined overhead rate for each driver:

Activity	Cost Driver	Estimated Overhead Costs	Total Activity	ABC Rate per Activity
Setting Up Machines	Machine setups	$ 200,000	5,000	$40
Purchasing Material	Number of purchase requisitions	500,000	10,000	50
Inspecting Products	Inspection hours	300,000	20,000	15
Assembling Products	Number of parts requiring labor	600,000	30,000	20
Technological Production	Machine hours	900,000	150,000	6
Total		$ 2,500,000		

Figure 9.12 *By: Rice University Openstax CC BY NC SA Long Description*

5. Allocate overhead costs to products. Assuming Musicality's activities were as estimated, the amount allocated to each product is:

	Expected Cost Driver Activities			
Activity	Solo	Band	Orchestra	Total
Machine Setups	$ 80,000	$ 60,000	$ 60,000	$ 200,000
Number of Purchase Requisitions	250,000	200,000	50,000	500,000
Inspection Hours	150,000	135,000	15,000	300,000
Number of Parts Requiring Labor	300,000	60,000	240,000	600,000
Machine Hours	480,000	360,000	60,000	900,000
Total Overhead	$1,260,000	$815,000	$425,000	$2,500,000

Figure 9.13 *By: Rice University Openstax CC BY NC SA Long Description*

Now that Musicality has applied overhead to each product, they can calculate the cost per unit. Management can review its sales price and make necessary decisions regarding its products. The overhead cost per unit is the overhead for each product divided by the number of units of each product:

Activity	Solo	Band	Orchestra	Total
Total Overhead	$1,260,000	$815,000	$425,000	$2,500,000
Number Units	140,000	100,000	250,000	490,000
Overhead per Unit	$ 9.00	$ 8.15	$ 1.70	

Figure 9.14 *By: Rice University Openstax CC BY NC SA*

The overhead per unit can be added to the unit cost for direct material and direct labor to compute the total product cost per unit:

	Solo	Band	Orchestra
Direct Materials per Unit	$ 3.50	$ 6.00	$11.70
Direct Labor per Unit	10.00	2.75	4.30
Overhead per Unit	9.00	8.15	1.70
Cost per Unit via ABC	$22.50	$16.90	$17.70

Figure 9.15 *By: Rice University Openstax CC BY NC SA*

The sales price was set after management reviewed the product cost with traditional allocation along with other factors such as competition and product demand. The current sales price, cost of each product using ABC, and the resulting gross profit are shown in Figure 9.16.

	Solo	Band	Orchestra
Sales Price	$20.00	$25.00	$30.00
Cost per Unit (ABC)	22.50	16.90	17.70
Gross Profit (loss) per Unit	$(2.50)	$ 8.10	$12.30

Figure 9.16 Solo's Sales Price, ABC Costing, and Gross Profit *By: Rice University Openstax CC BY NC SA*

The loss on each sale of the Solo product was not discovered until the company did the calculations for the ABC method, because the sales of the other products were strong enough for the company to retain a total gross profit.

Additionally, the more accurate gross profit for each product calculated using ABC is shown in Figure 9.17:

	Solo	Band	Orchestra	Total
Number of Units Sold	150,000	110,000	200,000	460,000
ABC Costing				
Sales	$3,000,000	$2,750,000	$6,000,000	$11,750,000
Cost of Goods Sold	3,375,000	1,859,000	3,540,000	8,774,000
Gross Profit (loss)	$ (375,000)	$ 891,000	$2,460,000	$ 2,976,000

Figure 9.17 Solo's Gross Profit by Product *By: Rice University Openstax CC BY NC SA Long Description*

The calculations Musicality did in order to switch to ABC revealed that the Solo product was generating a loss for every unit sold. Knowing this information will allow Musicality to consider whether they should make changes to generate a profit from the Solo product, such as increase the selling price or carefully analyze the costs to identify potential cost reductions. Musicality could also decide to continue selling Solo at a loss, because the other products are generating enough profit for the company to absorb the Solo product loss and still be profitable. Why would a company continue to sell a product that is generating a loss? Sometimes these products are ones for which the company is well known or that draw customers into the store. For example, companies will sometimes offer extreme sales, such as on Black Friday, to attract customers in the hope that the customers will purchase other products. This information shows how valuable ABC can be in many situations for providing a more accurate picture than traditional allocation.

The Service Industries and Their Use of the Activity-Based Costing Allocation Method

ABC costing was developed to help management understand manufacturing costs and how they can be better managed.

However, the service industry can apply the same principles to improve its cost management. Direct material and direct labor costs range from nonexistent to minimal in the service industry, which makes the overhead application even more important. The number and types of cost pools may be completely different in the service industry as compared to the manufacturing industry. For example, the health-care industry may have different overhead costs and cost drivers for the treatment of illnesses than they have for injuries. Some of the overhead related to monitoring a patient's health status may overlap, but most of the overhead related to diagnosis and treatment differ from each other.

Long Description

Many manufacturing companies use MRP (material requirements planning) or ERP (enterprise resource planning) systems. MRP helps management organize the planning, scheduling, and tracking of materials while ERP systems help plan, organize, and track the materials as well as the accounting, marketing, supply chain, and other management functions. Return

Comparison of Actual and Applied Overhead for Machine Overhead and Material Overhead. Machine Overhead: $2 Rate per machine hour x 490,000 Actual machine hours = 980,000 Applied resulting in a $30,000 difference Overapplied. Material Overhead: $50 Rate per Requisition x 15,500 requisitions = 775,000 Applied, resulting in a $(5,000) difference Underapplied. Return

Expected Cost Driver Activities for Solo, Band, Orchestra, and Total, respectively. Machine Setups: 2,000, 1,500, 1,500, 5,000. Number of Purchase Requisitions: 5,000, 4,000, 1,000, 10,000. Inspection Hours: 10,000, 9,000, 1,000, 20,000 Number of Parts

Requiring Labor: 15,000, 3,000, 12,000, 30,000 Machine Hours: 80,000, 60,000, 10,000, 150,000. Return

Activity, Cost Driver, Estimated Overhead Costs, Total Activity, and ABC Rate per Activity, respectively, for each activity is: Setting Up Machines, Machine setups, $200,000, 5,000, $40. Purchasing Material, Number of purchase requisitions, 500,000, 10,000, 50. Inspecting Products, Inspection hours, 300,000, 20,000, 15. Assembling Products, Number of parts requiring labor, 600,000, 30,000, 20. Technological Production, Machine hours, 900,000, 150,000, 6. Total Estimated Overhead Costs are $2,500,000. Return

Expected Cost Driver Activities for Solo, Band, Orchestra, and Total, respectively. Machine Setups: $80,000, $60,000, $60,000, $200,000. Inspection Hours: 150,000, 135,000, 15,000, 300,000. Number of Purchase Requisitions: 250,000, 200,000, 50,000, 500,000. Number of Parts Requiring Labor: 300,000, 60,000, 240,000, 600,000. Machine Hours: 480,000, 360,000, 60,000, 900,000. Total Overhead: $1,260,000, $815,000, $425,000, $2,500,000.
Return

Calculation of Total Gross Profit for Solo, Band, Orchestra, and Total, respectively. Number of Units Sold: 150,000, 110,000, 200,000, 460,000. ABC Costing Sales: $3,000,000, $2,750,000, $6,000,000, $11,750,000. Less Cost of Goods Sold: 3,375,000, 1,859,000, 3,540,000, 8,744,000. Equals Gross Profit (loss): $(375,000), $891,000, $2,460,000, $2,976,000. Return

Footnotes

- 4 Mary Ellen Biery. “A Sure-Fire Way to Boost the Bottom Line.” *Forbes*. January 12, 2014. https://www.forbes.com/sites/sageworks/2014/01/12/control-overhead-compare-industry-data/#47a9ea69d068

9.4 Comparing Traditional & Activity-based Costing

Calculating an accurate manufacturing cost for each product is a vital piece of information for a company's decision-making. For example, knowing the cost to produce a unit of product affects not only how a business budgets to manufacture that product, but it is often the starting point in determining the sales price.

An important component in determining the total production costs of a product or job is the proper allocation of overhead. For some companies, the often less-complicated traditional method does an excellent job of allocating overhead. However, for many products, the allocation of overhead is a more complex issue, and an activity-based costing (ABC) system is more appropriate.

Another factor to consider in determining which of the two major overhead allocation methods to use is the cost associated with collecting and analyzing information. When making their decision regarding which method to use, the company must consider these costs, both in time and money. Table 9.4 compares overhead in the two systems. In many cases, the ABC method is more expensive in terms of time and other costs.

The difference between the traditional method (using one cost driver) and the ABC method (using multiple cost drivers) is more complex than simply the number of cost drivers. When direct labor is a large portion of the product cost, the overhead costs tend to be consistently driven by one cost driver, which is typically direct labor or machine hours; the traditional method

appropriately allocates those costs. When technology is a large portion of the product cost, the overhead costs tend to be driven by multiple drivers, so using multiple cost drivers in the ABC method allows for a more precise allocation of overhead.

Table 9.4 Overhead in Traditional versus ABC Costing By: Rice University OpenStax CC BY-NC-SA 4.0

–	Traditional	ABC
Overhead assigned	Single cost driver	Multiple cost drivers
Optimal usage	When direct labor is a large portion of the product cost	When technology is a large portion of the product cost
Orientation	Cost driven	Process driven

As shown with Musicality's products, not only are there different costs for each product when comparing traditional allocation with an activity-based costing, but ABC showed that the Solo product creates a loss for the company. Activity-based costing is a more accurate method, because it assigns overhead based on the activities that drive the overhead costs. It can be concluded, then, that the cost and subsequent gross loss for each unit's sales provide a more accurate picture than the overall cost and gross profit under the traditional method. Table 9.4 compares the cost per unit using the different cost systems and shows how different the costs can be depending on the method used.

	Solo	Band	Orchestra
Cost per Unit via ABC	$22.50	$16.90	$17.70
Cost per Unit via Traditional	18.50	16.75	20.00
Difference	$ 4.00	$ 0.15	$(2.30)

Figure 9.18 *By: Rice University Openstax CC BY NC SA*

Advantages and Disadvantages of the

Traditional Method of Calculating Overhead

The traditional allocation system assigns manufacturing overhead based on a single cost driver, such as direct labor hours, direct labor dollars, or machine hours, and is optimal when there is a relationship between the activity base and overhead. This most often occurs when direct labor is a large part of the product cost. The theory supporting the single cost driver is that the cost driver selected increases as overhead increases, and further analysis is more costly than it is valuable. Each method has its advantages and disadvantages. These are advantages of the traditional method:

- All manufacturing costs are classified as material, labor, or overhead and assigned to products regardless of whether they drive or are driven by production.
- All manufacturing costs are considered to be part of the product cost, whereas nonmanufacturing costs are not considered to be production costs and are not assigned to products, regardless of whether the costs are based on the products. For example, the machines used to receive and process customer orders are necessary because product orders must be taken, but their costs are not allocated to particular products.
- There is only one overhead cost pool and a single measure of activity, such as direct labor hours, which makes the traditional method simple and less costly to maintain. The predetermined overhead rate is based on estimated costs at the budgeted level of activity. Therefore, the overhead rate is consistent across products, but overhead may be over- or underapplied.

Disadvantages of the traditional method include:

- The use of the single cost driver does not allocate overhead as accurately as using multiple cost drivers.
- The use of the single cost driver may overallocate overhead to one product and underallocate overhead to another product, resulting in erroneous total costs and potentially setting an incorrect sales price.
- Traditional allocation assigns costs as period or product costs, and all product costs are included in the cost of inventory, which makes this method acceptable for generally accepted accounting principles (GAAP).

Advantages and Disadvantages of Creating an Activity-Based Costing System for Allocating Overhead

While ABC systems more accurately allocate the costs based on the various resources used to make the product, they cost more to use and, therefore, are not always the best method. Management needs to consider each system and how it will work within its own organization. Some advantages of activity-based costing include:

- There are multiple overhead cost pools, and each has its own unique measure of activity. This provides more accurate rates for applying overhead, but it takes more time to implement and results in a higher cost.
- The allocation bases (i.e., measures of activity) often differ from those used in traditional allocation. Multiple cost pools allow management to group costs being influenced by similar drivers and to consider cost drivers beyond the typical labor or machine hour. This results in a more accurate overhead application rate.
- The activity rates may consider the level of activity at

capacity instead of the budgeted level of activity.
- Both nonmanufacturing costs and manufacturing costs may be assigned to products. The main rationale in assigning costs is the relationship between the cost and the product. If the cost increases as the volume of the product increases, it is considered part of overhead.

There are disadvantages to using ABC costing that management needs to consider when determining which method to use. Those disadvantages include:

- Some manufacturing costs may be excluded from product costs. For example, the cost to heat the factory may be excluded as a product cost because, while it is necessary for production, it does not fit into one of the activity-driven cost pools.
- It is more expensive, as there is a cost to collect and analyze cost driver information as well as to allocate overhead on the basis of multiple cost drivers.
- An ABC system takes much more to implement and operate, as information on cost drivers must be collected in an objective manner.

The advantages and disadvantages of both methods are as previously listed, but what is the practical impact on the product cost? There are several items to consider at the product costs level:

- Adopting an ABC overhead allocation system can allow a company to shift manufacturing overhead costs between products based on their volume.
- Using an ABC method to better assign unit-level, batch-level, product-level, and factory-level costs can increase the per-unit costs of the low-volume products and decrease the per-unit costs of the high-volume products.

- The effects are not symmetrical; there is usually a larger change in the per-unit costs of the low-volume products.
- The cost of the products may include some period costs but not some of the product costs, so it is not considered GAAP compliant. The information is supplemental and very helpful to management, but the company still needs to compute the product's cost under the traditional method for financial reporting.

CHAPTER 8- JOB ORDER & PROCESS COSTING

Job Order Costing

8.1 Job Order v. Process Costing

Job Order Costing versus Process Costing

Job order costing is an accounting system that traces the individual costs directly to a final job or service, instead of to the production department. It is used when goods are made to order or when individual costs are easy to trace to individual jobs, assuming that the additional information provides value. In these circumstances, the individual costs are easy to trace to the individual jobs.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=1371#oembed-1

For example, assume that a homeowner wants to have a custom deck added to her home. Also assume that in order to fit her lot's topography and her anticipated uses for the addition, she needs a uniquely designed deck. Her contractor will design the deck, price the necessary components (in this case, the direct materials, direct labor, and overhead), and construct it.

The final cost will be unique to this project. If another homeowner wanted the contractor to construct a deck, the contractor would go through the same design and pricing

process, and you would expect that the design and costs would not be the same as those of the deck in the first example, since the decks would differ from one another.

The job order costing method also works well for companies such as movie production companies, print service providers, advertising agencies, building contractors, accounting firms, consulting entities, and repair service providers. For example, *Star Wars: The Last Jedi* is believed to have cost $200 million to produce, whereas *Logan* only cost $97 million. The production processes for both films differed significantly, so that the accumulated costs for each job also differed significantly. Both were made in 2017.[1]

In contrast, process costing is used when the manufacturing process is continuous, so it is difficult to establish how much of each material is used and exactly how much time is invested in each unit of finished product. Therefore, in process costing, costs are accounted for by the production process or production department instead of by the product or by the job. This method works well for manufacturers of products such as **Titleist** golf balls, **Kellogg's** cereal, **Turkey Hill** ice cream, **CITGO** gasoline, **Dow** Chemicals, or **Sherwin Williams**' paints. However, process costing is not limited to basic manufacturing activities: It can also be used in the manufacturing of more complex items, such as small engines. A process costing system assigns costs to each department as the costs are incurred, and the costs to produce one unit are calculated based on the information from the production department. Unit costs are determined after total production costs are determined.

One factor that can complicate the choice between job order costing and process costing is the growth of automation in the production process, which typically is accompanied by a reduction in direct labor. The cost of the increase in equipment (typically reflected as a depreciation expense) is allocated to overhead, while the decreased need for labor usually reduces

the direct labor cost. Because of these issues, some companies choose a hybrid system, using process costing to account for mass producing a part and using job order costing to account for assembling some of those individual parts into a custom product. Table 8.1 summarizes the use of these two systems.

Table 8.1 Differences between Job Order Costing and Process Costing By: Rice University OpenStax CC BY-NC-SA 4.0

–	Job Order Cost System	Process Cost System
Product type	Custom order	Mass production
Examples	Signs, buildings, tax returns	Folding tables, toys, buffet restaurants
Cost accumulation	Job lot	Accumulated per process
Work in process inventory	Individual job cost sheets	Separate work in process inventory department
Record keeping	Individual job cost sheets	Production cost report

To illustrate how a company can determine whether to use job order costing or process costing, consider the cost accounting options for a local restaurant. Macs & Cheese makes specialty macaroni and cheese, and the company wants to erect a special sign on an already constructed billboard outside a stadium. It wants to use this space to target stadium customers; thus, the company wants a sign built specifically for that site. Dinosaur Vinyl is secured as the sign manufacturer and would use job order costing to account for the associated manufacturing costs because of the unique nature of the sign, including the art work involved. However, if Macs & Cheese was designing a costing system for the specialty food product they market, they typically would use a process costing approach because their product is made and marketed in homogeneous, similar batches.

Organization of Flow of Goods through Production

Regardless of the costing method used (job order costing, process costing, or another method), manufacturing companies are generally similar in their organizational structure and have a similar flow of goods through production. The diagram in Figure 8.1 shows a partial organizational chart for sign manufacturer Dinosaur Vinyl. The CEO has several direct reporting units—Financing, Production, Information Technology, Marketing, Human Resources, and Maintenance—each with a director responsible for several departments.

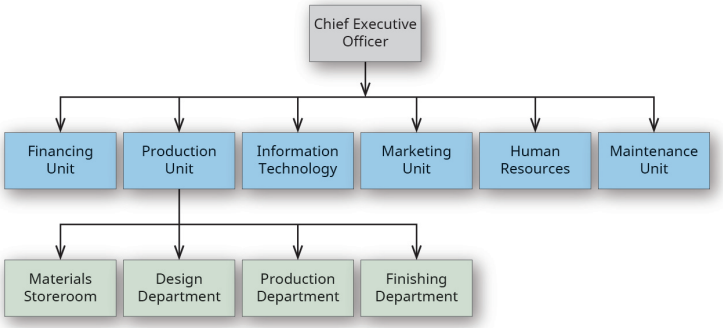


Figure 8.1 Organizational Chart for a Manufacturing Company*. The different units within Dinosaur Vinyl illustrate the two main cost categories of a manufacturing company: manufacturing costs (the production unit), and selling and administrative costs. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

The diagram also shows the departments that report to the production unit director and gives an indication as to the flow of goods through production. The flow of goods through production is more evident in Figure 8.2, which depicts

Dinosaur Vinyl as a simple factory with three stages of production.

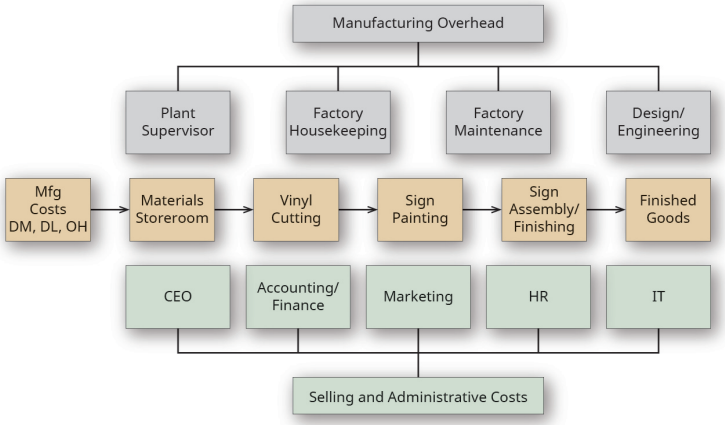


Figure 8.2 Factory Layout for Dinosaur Vinyl. *The flow of goods and areas of manufacturing versus administrative costs are more easily seen by looking at the factory layout for Dinosaur Vinyl. The departments across the bottom represent administrative costs, whereas the departments in the middle represent manufacturing costs—although Design/Engineering can sometimes be considered part of administrative costs, depending on how management chooses to categorize those costs. The departments listed across the top represent examples of manufacturing overhead. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Raw materials are stored in the materials storeroom and delivered to the appropriate production department—cutting, painting, or assembly/finishing. The design department uses direct labor to create the design specifications, and, when completed, it sends them to the production department. The production department uses the material and design specifications and adds additional labor to create the sign. The sign is transferred to the finishing department for final materials and labor, before the sign is installed or delivered to the customer.

Manufacturing Costs

In a manufacturing environment, the manufacturing costs are also called *product costs* and include all expenses used to manufacture the product: direct materials, direct labor, and manufacturing overhead. The total of these costs becomes the cost of ending inventory and later becomes the cost of goods sold when the product is sold. Both job order costing and process costing use categorized cost information to make decisions and evaluate the effectiveness of the cost tracking process. Because of the difference in how each of the two costing systems track costs, different terminology is used. Thus, it is important to separate product costs from period costs, and it is sometimes important to separate product costs into prime costs and conversion costs. Prime costs are costs that include the primary (or direct) product costs: direct materials and direct labor. Conversion costs are costs that include the expenses necessary to convert direct materials into a finished product: direct labor and manufacturing overhead. Their relationship is shown in Figure 8.3.

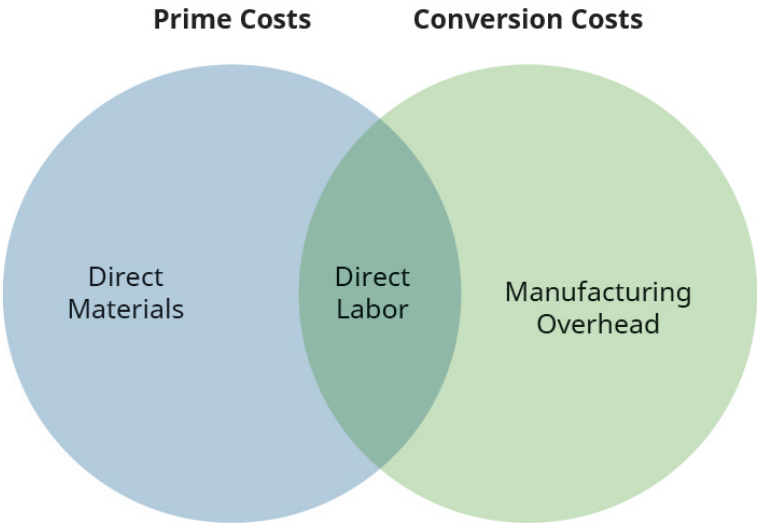


Figure 8.3 Manufacturing Costs *Management sometimes needs additional information to make decisions and needs the costs categorized as prime costs or conversion costs. Prime costs and conversion costs are not included together as direct labor is included in both categories. By: Rice University OpenStax CC BY-NC-SA 4.0*

Job order costing systems assign costs directly to the product by assigning direct materials and direct labor to the work in process (WIP) inventory. As you learned previously, direct materials are the components that can be directly traced to the products produced, whereas direct labor is the labor cost that can be directly traced to the products produced.

Material and labor costs that cannot be traced directly to the product produced are included in the overhead costs that are allocated in the production costing process. Overhead is applied to each product based on an activity base, which will be explained later in this chapter.

The assignment of direct materials and direct labor to each production unit illustrates the job order costing system's focus on prime costs, in contrast to the process costing system,

which assigns costs to the department and focuses on direct materials and conversion costs, which are composed of a combination of direct labor and overhead.

Selling and Administrative Costs

Selling and administrative costs (S&A) are period costs, and these costs are expensed as incurred, instead of being included in the product's costs, as they move through the relevant inventory accounts. A period cost is a cost tied to a specific time period, such as a month, quarter, or year, instead of being associated with a particular job order. For example, if a company paid an insurance company $12,000 for one year's liability insurance coverage, the first month's expense would be $1,000. This expense would not be related to a particular job order, but instead would be classified as a period cost, and in this case recorded monthly as an administrative expense. Selling costs are the expenses related to the promotion and sale of the company's products, whereas administrative costs are the expenses related to the operations of the company. The S&A costs are considered period costs because they include costs of departments not directly associated with manufacturing but necessary to operate the business. Some examples include research and development costs, marketing costs, sales commissions, administration building rent, the CEO's salary expense, and accounting, payroll, and IT department expenses.

YOUR TURN

Maria's Market

A grocery store's analysis of a recent customer survey finds an increasing number of customers interested in being able to custom-order meals to go. Maria sees this as an opportunity to enter a niche market for busy families or individuals who want home-cooked meals with a variety of options and combinations, but who have little time. Maria already has an expansive deli, bakery, and prepared foods section in the store and sees this opportunity as a viable option to increase sales and its customer base. With meals to go, customers can choose from an array of options and can indicate the quantity of each item and the time of pickup. The customer simply pulls up in a designated spot at Maria's and the food is brought to their car, packaged, and ready to take home to enjoy.

What type of costing system will work best for the Maria's Market? What sales price information, cost information, and other options are important to this decision?

Solution

A job order cost system will work well for this store. In addition to specific price and cost, these are other important considerations.

- The optimal sales price should be set to encourage customers to purchase the meals.
- The materials, labor, and overhead cost should be considered for each meal option.
    - Direct material costs may include the cost of the protein, grain, and vegetable option, as well as the cost of the packing containers.
    - The direct labor cost is for employees who are directly

involved in preparing the meals.
    - Manufacturing overhead includes the cost of gloves used when preparing the meals, the cost of employees who support but are not directly involved in preparing the meals, and the cost to operate the oven.
- The cost of the various meal options should all be less than the sales price.
- The meal options should change to take advantage of seasonal items.
- There may be a need to vary the sales price, depending on the combinations selected.

Recording Costs in Job Order Costing versus Process Costing

Both job order costing and process costing track the costs of materials, labor, and overhead as components of virtually all products. The process of production does not change because of the costing method: The costing method is chosen based on the process of production and is intended to provide the most accurate representation of the costs incurred in the production process.

Maintaining accounting records for each system has its advantages. A job order costing system uses a job cost sheet to keep track of individual jobs and the direct materials, direct labor, and overhead associated with each job. The focus of a job order costing system is tracking costs per job, since each

job is unique and therefore has different costs relative to other jobs. Maintaining this information is typically more expensive than process costing, and it is often used for the production of smaller, more individualized jobs because the benefit of knowing the cost of each product outweighs the additional cost of maintaining a job order costing system.

In contrast, a process costing system does not need to maintain the cost for individual jobs because the jobs use a continual system of production, and the items are typically not significantly unique but instead are basically equivalent. The accounting emphasis is in keeping records for the individual departments, which is useful for large batches or runs. Process costing is the optimal system to use when the production process is continuous and when it is difficult to trace a particular input cost to an individual product. Process costing systems assign costs to each department as the costs are incurred. The costs to produce one unit are calculated, based on the information from the production department. Therefore, the focus of process costing systems is on measuring and assigning the conversion costs to the proper department in order to best determine the cost of individual units.

Under either costing method, accounting theory explains why it is important to understand when costs become expenses. A primary reason for separating production costs from other company expenses is the expense recognition principle, which requires costs to be expensed when they match the revenue being earned and to separate the costs of production from other costs for the proper timing of recognition of expenses. Think about measuring the profit from the sale of an item, say a TV, in a nonmanufacturing environment. It is logical to subtract the costs associated with buying the TV in order to determine the profit, before applying other costs from that sale. Suppose the TV was purchased as inventory by the store in January and sold to a customer in March. This requires that the cost of the TV not be recorded

as an expense (cost of goods sold) until March, when the sale from the TV is recorded, thus matching the revenue with the expense. Until that time, the TV and its cost are considered inventory. This same idea applies to the manufacturing process.

Per the expense recognition principle, product costs—the direct materials, direct labor, and manufacturing overhead incurred to produce the job—are expensed on the income statement for the period of the sale as cost of goods sold when the completed job is sold. If the products are not sold, their costs remain in ending inventory.

Prior to the sale of the product, separating production costs and assigning them to the product results in these costs remaining with the inventory. Until they are sold, the costs incurred are reflected in an assortment of inventory accounts, such as raw materials inventory, work in process inventory, and finished goods inventory.

In contrast, period costs are not directly related to the production process and are expensed during the period in which they are incurred. This approach matches administrative and other expenses shown on the income statement in the same period in which the company earns income.

Long Descriptions

An organizational chart with three tiers. The first tier is labeled “Chief Executive Officer”. The second tier branches from the first, and is labeled from left to right “Financing Unit”, “Production Unit”, “Information Technology”, “Marketing Unit”, “Human Resources”, and “Maintenance Unit”. The third tier branches from “Production Unit” and is labeled “Materials Storeroom”, “Design Department”, “Production Department”, and “Finishing Department”. Return

A factory floor layout from above, showing three rows of

departments. The top row is labeled “Manufacturing Overhead” and includes “Plant Supervisor”, “Factory Housekeeping”, “Factory Maintenance”, and “Design/engineering”. The middle row is labeled “Manufacturing Costs, DM, DL, OH) and includes “Materials Storeroom”, “Vinyl Cutting”, Sign Painting”, “Sign Assembly/Finishing”, and “Finished Goods.” The bottom row is labeled “Selling and Administrative Costs” and includes “CEO”, “Accounting/Finance”, “Marketing”, “HR”, and “IT”. Return

Footnotes

- 1 “Production Costs and Global Box Office Revenue of Star Wars Movies from 1977 to 2018 (in million U.S. dollars).” The Statistics Portal. https://www.statista.com/statistics/311356/star-wars-production-costs-box-office-revenue/.

8.2 Under- or Over-Applied Overhead



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=1382#oembed-1

As you've learned, the actual overhead incurred during the year is rarely equal to the amount that was applied to the individual jobs. Thus, at year-end, the manufacturing overhead account often has a balance, indicating overhead was either overapplied or underapplied.

If, at the end of the term, there is a debit balance in manufacturing overhead, the overhead is considered underapplied overhead. A debit balance in manufacturing overhead shows either that not enough overhead was applied to the individual jobs or overhead was underapplied. If, at the end of the term, there is a credit balance in manufacturing overhead, more overhead was applied to jobs than was actually incurred. This shows the actual amount was overapplied overhead.

The actual overhead costs are recorded through a debit to manufacturing overhead. The same account is credited when overhead is applied to the individual jobs in production, as shown:

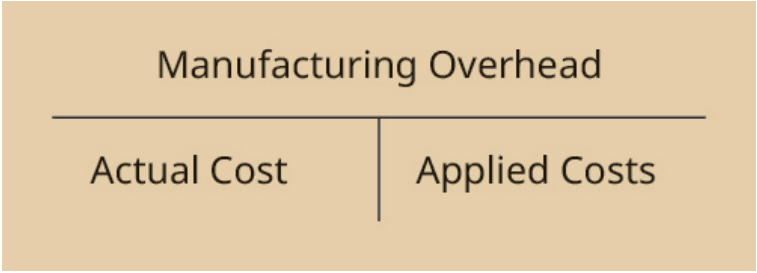


Figure 8.4 *By: Rice University Openstax CC BY SA 4.0*

Since the overhead is first recorded in the manufacturing overhead account, then applied to the individual jobs, traced through finished goods inventory, and eventually transferred to cost of goods sold, the year-end balance is eliminated through an adjusting entry, offsetting the cost of goods sold. If manufacturing overhead has a debit balance, the overhead is underapplied, and the resulting amount in cost of goods sold is understated. The adjusting entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cost of Goods Sold	$$$	
	Manufacturing Overhead		$$$

Figure 8.5 *By: Rice University Openstax CC BY SA 4.0*

If manufacturing overhead has a credit balance, the overhead is overapplied, and the resulting amount in cost of goods sold is overstated. The adjusting entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Manufacturing Overhead Cost of Goods Sold *Application of overhead to Cost of Goods Sold*	$$$	$$$

Figure 8.6 *By: Rice University Openstax CC BY SA 4.0*

Returning to our example, at the end of the year, Dinosaur Vinyl had actual overhead expenses of $256,500 and applied overhead expenses of $250,000, as shown:

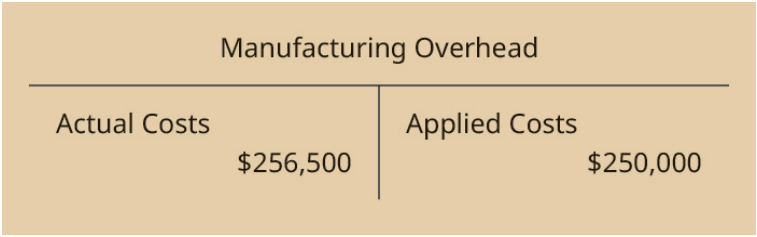


Figure 8.7 *By: Rice University Openstax CC BY SA 4.0*

Since manufacturing overhead has a debit balance, it is underapplied, as it has not been completely allocated. The adjusting journal entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cost of Goods Sold Manufacturing Overhead *Application of underapplied overhead to Cost of Goods Sold*	6,500	6,500

Figure 8.8 *By: Rice University Openstax CC BY SA 4.0*

If the overhead was overapplied, and the actual overhead was

$248,000 and the applied overhead was $250,000, the entry would be:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Manufacturing Overhead Cost of Goods Sold *Application of overapplied overhead to Cost of Goods Sold*	2,000	2,000

Figure 8.9 *By: Rice University Openstax CC BY SA 4.0*

To adjust for overapplied or underapplied manufacturing overhead, some companies have a more complicated, three-part allocation to work in process, finished goods, and cost of goods sold. This method is typically used in the event of larger variances in their balances or in bigger companies. (You will learn more about this in future cost or advanced managerial accounting courses.)

YOUR TURN

Kraken Boardsports




Figure 8.10 *By: Kraken Boardsports CC BY 4.0*

Kraken Boardsports manufactures winches for snow and ski boarders to snow ski without a mountain or water ski without a lake (Figure 8.10). End-of-year data show these overhead expenses:

Indirect materials	$25,000
Indirect labor	31,750
Depreciation of factory equipment	50,000
Factory utility expenses	17,500
Factory supervisor salaries	85,000

Figure 8.11 *By: Rice University Openstax CC BY SA 4.0*

Kraken Boardsports had 6,240 direct labor hours for the year and assigns overhead to the various jobs at the rate of $33.50 per direct labor hour.

How much overhead was overapplied or underapplied

during the year? What would be the journal entry to adjust manufacturing overhead?

Solution

The total overhead incurred is the total of:

Indirect materials	$ 25,000
Indirect labor	31,750
Depreciation of factory equipment	50,000
Factory utility expenses	17,500
Supervisor salaries	85,000
Actual overhead incurred	$209,250

Figure 8.12 *By: Rice University Openstax CC BY SA 4.0*

The total overhead applied is $209,040, which is calculated as:

$33.50 ÷ direct labor hours × 6,240 direct labor hours.

The balance in manufacturing overhead is a debit balance of $210:

	Manufacturing Overhead	
	Actual Costs	Applied Costs
	$209,250	$209,040
Balance	210	

Figure 8.13 *By: Rice University Openstax CC BY SA 4.0*

The adjusting journal entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cost of Goods Sold	210	
	Manufacturing Overhead		210

Figure 8.14 *By: Rice University Openstax CC BY SA 4.0*

8.3 Three Major Components of Product Costs in Job Order

In order to set an appropriate sales price for a product, companies need to know how much it costs to produce an item. Just as a company provides financial statement information to external stakeholders for decision-making, they must provide costing information to internal managerial decision makers. Virtually every tangible product has direct materials, direct labor, and overhead costs that can include indirect materials and indirect labor, along with other costs, such as utilities and depreciation on production equipment. To account for these and inform managers making decisions, the costs are tracked in a cost accounting system.

While the flow of costs is generally the same for all costing systems, the difference is in the details: Product costs have material, labor, and overhead costs, which may be assessed differently. In most production facilities, the raw materials are moved from the raw materials inventory into the work in process inventory. The work in process involves one or more production departments and is where labor and overhead convert the raw materials into finished goods. The movement of these costs through the work in process inventory is shown in Figure 8.15.

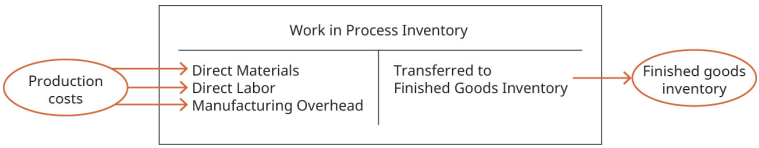


Figure 8.15 Work in Process Inventory. *Direct materials, direct labor, and manufacturing overhead enter the work in process inventory as the costs associated with the products that are in production. Once the products are completed, their costs are transferred to the finished goods inventory. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

At this stage, the completed products are transferred into the finished goods inventory account. When the product is sold, the costs move from the finished goods inventory into the cost of goods sold.

While many types of production processes could be demonstrated, let's consider an example in which a contractor is building a home for a client. The accounting system will track direct materials, such as lumber, and direct labor, such as the wages paid to the carpenters constructing the home. Along with these direct materials and labor, the project will incur manufacturing overhead costs, such as indirect materials, indirect labor, and other miscellaneous overhead costs. Samples of these costs include indirect materials, such as nails, indirect labor, such as the supervisor's salary, assuming that the supervisor is overseeing several projects at the same time, and miscellaneous overhead costs such as depreciation on the equipment used in the construction project.

As direct materials, direct labor, and overhead are introduced into the production process, they become part of the work in process inventory value. When the home is completed, the accumulated costs become part of the finished goods inventory value, and when the home is sold, the finished goods value of the home becomes the cost of goods sold. Figure 8.16 illustrates the flow of these costs through production.

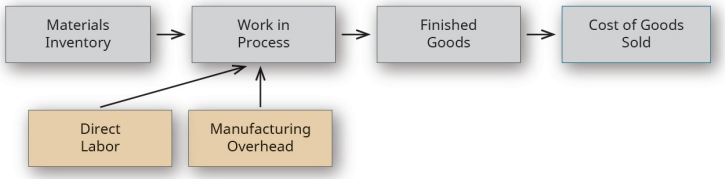


Figure 8.16 Flow of Materials from Raw Materials to Finished Goods. *Accounting methods track a product's material, labor, and overhead costs, as it moves through production. By: Rice University, OpenStax CC BY-NC-SA 4.0*

The three general categories of costs included in manufacturing processes are direct materials, direct labor, and overhead. Note that there are a few exceptions, since some service industries do not have direct material costs, and some automated manufacturing companies do not have direct labor costs. For example, a tax accountant could use a job order costing system during tax season to trace costs. The one major difference between the home builder example and this one is that the tax accountant will not have direct material costs to track. The few assets used will typically be categorized as overhead.

A benefit of knowing the production costs for each job in a job order costing system is the ability to set appropriate sales prices based on all the production costs, including direct materials, direct labor, and overhead. The unique nature of the products manufactured in a job order costing system makes setting a price even more difficult. For each job, management typically wants to set the price higher than its production cost. Even if management is willing to price the product as a loss leader, they still need to know how much money will be lost on each product. To achieve this, management needs an accounting system that can accurately assign and document the costs for each product.

If you're not familiar with the concept of a loss leader, a simple example might help clarify the concept. A loss leader is a product that is sold at a price that is often less than the cost of producing it in order to entice you to buy accessories that are necessary for its use. For example, you might pay $50 or $60 for a printer (for which the producer probably does not make any profit) in order to then sell you extremely expensive printer cartridges that only print a few pages before they have to be replaced. However, even pricing a product as a loss leader requires analysis of the three categories of costs: direct materials, direct labor, and overhead.

Direct Materials

Direct materials are those materials that can be directly traced to the manufacturing of the product. Some examples of direct materials for different industries are shown in Table 8.2 In order to respond quickly to production needs, companies need raw materials inventory on hand. While production volume might change, management does not want to stop production to wait for raw materials to be delivered. Further, a company needs raw materials on hand for future jobs as well as for the current job. The materials are sent to the production department as it is needed for production of the products.

Table 8.2 Common Direct Materials by Industry By: Rice University OpenStax CC BY-NC-SA 4.0

Industry	Direct Materials
Automotive	Iron, aluminum, glass, rubber
Cell phones	Glass, various metals, plastic
Furniture	Wood, leather, vinyl
Jewelry	Gold, silver, diamonds, rubies
Pharmaceuticals	Natural or synthetic biological ingredients

Each job begins when raw materials are put into the work in process inventory. When the materials are requested for production, a materials requisition slip is completed and shows the exact items and quantity requested, along with the associated cost. The completed form is signed by the requestor and approved by the manager responsible for the budget.

Returning to the example of Dinosaur Vinyl's order for Macs & Cheese's stadium sign, Figure 8.17 shows the materials requisition form for Job MAC001. This form indicates the quantity and specific items to be put into the work in process. It also transfers the cost of those items to the work in process inventory and decreases the raw materials inventory by the same amount. The raw materials inventory department maintains a copy to document the change in inventory levels, and the accounting department maintains a copy to properly assign the costs to the particular job.

MATERIALS REQUISITION FORM
Dinosaur Vinyl, Inc.

Material Requisition No.: 3392
Job No.: MAC001
Date of Request: 4/5/2017
Date Needed: 4/5/2017

Description	Quantity	Unit Cost	Total Cost
Raw materials inventory: Vinyl	1	$300	$300
Raw materials inventory: Black ink	2	50	100
Raw materials inventory: Red ink	1	60	60
Raw materials inventory: Gold ink	1	60	60
Raw materials inventory: Grommets	12	10	120
Raw materials inventory: Framing wood	40	1.50	60
			$700

Requested by: john ming Date: 4/5/17

Authorized by: Lula Clark Date: 4/5/17

Figure 8.17 Materials Requisition Form for Job MAC001. *The materials requisition form allows different departments to track and account for the direct materials needed to manufacture the product. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Dinosaur Vinyl has a beginning inventory of $1,000 in *raw materials: vinyl*, and $300 in each of its ink inventories: *raw*

materials: black ink, *raw materials: red ink*, and *raw materials: gold ink*. In order to have enough inventory on hand for all of its jobs, it purchases $10,000 in vinyl and $500 in black ink. The T-accounts in Figure 8.18 show the stated beginning debit balances. An additional $10,000 of vinyl and $500 of black ink were then purchased for anticipated use, providing the demonstrated final account balances. The red ink and gold ink balances did not change, since no additional quantities were purchased.

The beginning balances and purchases in each of these accounts are illustrated in Figure 8.18.

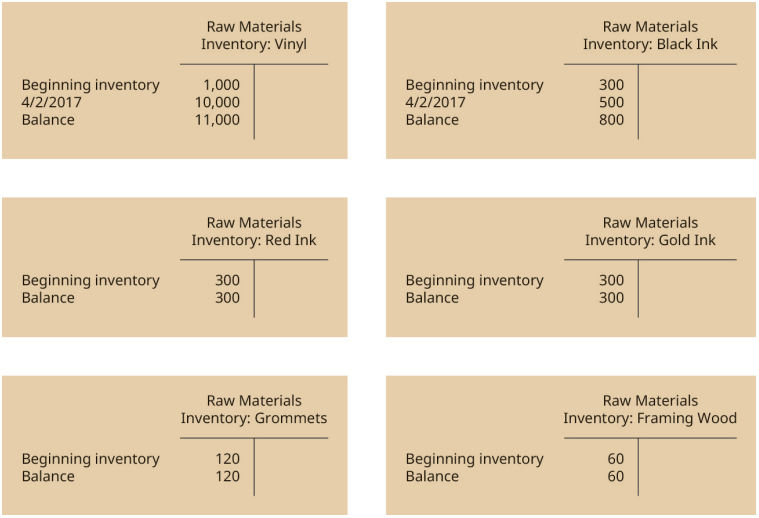


Figure 8.18 Beginning Balances and Purchases. *These T-accounts show the balances for the raw materials inventory. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Traditional billboards with the design printed on vinyl include direct materials of vinyl and printing ink, plus the framing materials, which consist of wood and grommets. The typical billboard sign is 14 feet high by 48 feet wide, and Dinosaur Vinyl incurs a vinyl cost of $300 per billboard. The price for the ink

varies by color. For this job, Dinosaur Vinyl needs two units of black ink at a cost of $50 each, one unit of red ink and one unit of gold ink at a cost of $60 each, twelve grommets at a cost of $10 each, and forty units of wood at a cost of $1.50 per unit. The total cost of direct materials is $700, as shown in Figure 8.19.

Item	Units	Cost per Unit	Item Cost	Total Cost
Production Department				
Vinyl	1	$ 300	$300	
Black ink	2	50	100	
Red ink	1	60	60	
Gold ink	1	60	60	$520
Finishing Department				
Grommets	12	$ 10	$120	
Framing wood	40	1.50	60	180
Total Direct Materials				$700

Figure 8.19 Direct Materials Needed for Job MAC001. *The costs for direct materials needed by both the production and finishing departments are shown. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Some items are more difficult to measure per unit, such as adhesives and other materials not directly traceable to the final product. Their costs are assigned to the product as part of manufacturing overhead as indirect materials.

When Dinosaur Vinyl requests materials to complete Job MAC001, the materials are moved from raw materials inventory to work in process inventory. We will use the beginning inventory balances in the accounts that were provided earlier in the example. The requisition is recorded on the job cost sheet along with the cost of the materials transferred. The costs assigned to job MAC001 are $300 in vinyl, $100 in black ink, $60 in red ink, and $60 in gold ink. During the finishing stages, $120 in grommets and $60 in wood are requisitioned and put into work in process inventory. The costs are tracked from the materials requisition form to the work in process inventory and noted specifically as part of Job MAC001

on the preceding job order cost sheet. The movement of goods is illustrated in Figure 8.20.

Raw Materials Inventory: Vinyl		
Beginning inventory	1,000	
4/2/2017	10,000	
4/2/2017		300
Balance	10,700	

Raw Materials Inventory: Grommets		
Beginning inventory	300	
4/14/2017		120
Balance	180	

Raw Materials Inventory: Black Ink		
Beginning inventory	300	
4/2/2017	500	
4/2/2017		100
Balance	700	

Raw Materials Inventory: Framing Wood		
Beginning inventory	300	
4/14/2017		60
Balance	240	

Raw Materials Inventory: Red Ink		
Beginning inventory	300	
4/2/2017		60
Balance	240	

Work in Process Inventory		
4/2/2017	520	
4/14/2017	180	

Raw Materials Inventory: Gold Ink		
Beginning inventory	300	
4/2/2017		60
Balance	240	

Figure 8.20 Movement of Goods. *These T-accounts illustrate the tracking of costs from raw materials inventory to the work in process inventory as the product moves through the manufacturing process. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Each of the T-accounts traces the movement of the raw materials from inventory to work in process. The vinyl and ink were used first to print the billboard, and then the billboard went to the finishing department for the grommets and frame, which were moved to work in process after the vinyl and ink. The final T-account shows the total cost for the raw materials placed into work in process on April 2 (vinyl and ink) and on April 14 (grommets and wood).

Direct Labor

Direct labor is the total cost of wages, payroll taxes, payroll benefits, and similar expenses for the individuals who work directly on manufacturing a particular product. The direct labor costs for Dinosaur Vinyl to complete Job MAC001 occur in the production and finishing departments. In the production department, two individuals each work one hour at a rate of $15 per hour, including taxes and benefits. The finishing department's direct labor involves two individuals working one hour each at a rate of $18 per hour. Figure 8.21 shows the direct labor costs for Job MAC001.

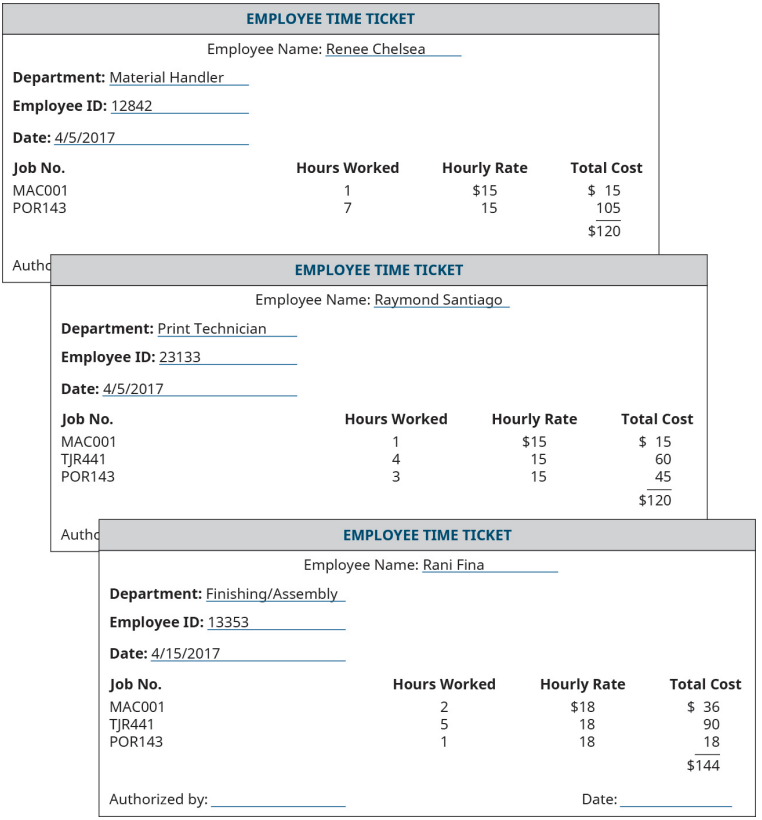
Item	Hours	Rate per Hour	Item Cost	Total Cost
Production Department				
Material Handler	1	$15	$15	
Print Technician	1	15	15	$30
Finishing Department				
Production Assistant	1	$18	$18	
Production Assistant	1	18	18	36
Total Direct Labor				$66

Figure 8.21 Direct Labor for Job MAC001*. Labor costs account for individuals working directly on the product. Individuals whose contributions are indirect will be tracked under manufacturing overhead. By: Rice University, OpenStax CC BY-NC-SA 4.0 Long Description*

Job MAC001 is also manufactured with the work of individuals whose contributions cannot be directly traced to the product: These indirect labor costs are assigned to the product as part of manufacturing overhead.

A company can use various methods to trace employee wages to specific jobs. For example, employees may fill out time tickets that include job numbers and time per job, or workers may scan bar codes of specific jobs when they begin a job task. Figure 8.22 shows what time tickets might look like on Job MAC001. Please note that in the employee time tickets

that are displayed, each employee worked on more than one job. However, we are only going to track the expenses for Job MAC001.



EMPLOYEE TIME TICKET

Employee Name: Renee Chelsea

Department: Material Handler

Employee ID: 12842

Date: 4/5/2017

Job No.	Hours Worked	Hourly Rate	Total Cost
MAC001	1	$15	$ 15
POR143	7	15	105
			$120

Autho

EMPLOYEE TIME TICKET

Employee Name: Raymond Santiago

Department: Print Technician

Employee ID: 23133

Date: 4/5/2017

Job No.	Hours Worked	Hourly Rate	Total Cost
MAC001	1	$15	$ 15
TJR441	4	15	60
POR143	3	15	45
			$120

Autho

EMPLOYEE TIME TICKET

Employee Name: Rani Fina

Department: Finishing/Assembly

Employee ID: 13353

Date: 4/15/2017

Job No.	Hours Worked	Hourly Rate	Total Cost
MAC001	2	$18	$ 36
TJR441	5	18	90
POR143	1	18	18
			$144

Authorized by: _____ Date: _____

Figure 8.22 Employee Time Tickets. *Time tickets (or time cards) are one method a company can use to track direct labor costs per individual and per job. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

When the accounting department processes time tickets, the costs are assigned to the individual jobs, resulting in labor costs being recorded on the work in process inventory, as shown in Figure 8.23.

	Work in Process Inventory
4/2/2017	520
4/5/2017	30
4/14/2017	180
4/15/2017	36

Figure 8.23 Costs Accounted for in the Work in Process Inventory. *The direct material costs of $520 and $180, and the direct labor costs of $30 and $36 assigned to Job MAC001 are shown. By: Rice University OpenStax under CC BY-NC-SA 4.0*

Manufacturing Overhead

Recall that the costs of a manufactured item are direct materials, direct labor, and manufacturing overhead. Costs that support production but are not direct materials or direct labor are considered overhead. Manufacturing overhead has three components: indirect materials, indirect labor, and overhead.

Indirect Materials

Indirect material costs are derived from the goods not directly traced to the finished product, like the sign adhesive in the Dinosaur Vinyl example. Tracking the exact amount of adhesive used would be difficult, time consuming, and expensive, so it makes more sense to classify this cost as an indirect material.

Indirect materials are materials used in production but not traced to specific products because the net informational value from the time and effort to trace the cost to each individual product produced is impossible or inefficient. For example, a furniture factory classifies the cost of glue, stain, and nails as indirect materials. Nails are often used in furniture production;

however, one chair may need 15 nails, whereas another may need 18 nails. At a cost of less than one cent per nail, it is not worth keeping track of each nail per product. It is much more practical to track how many pounds of nails were used for the period and allocate this cost (along with other costs) to the overhead costs of the finished products.

Indirect Labor

Indirect labor represents the labor costs of those employees associated with the manufacturing process, but whose contributions are not directly traceable to the final product. These would include the costs of the factory floor supervisor, the factory housekeeping staff, and factory maintenance workers. For Dinosaur Vinyl, for example, labor costs for the technician who maintains the printers would be indirect labor. It would be too time consuming to determine how much of the technician's time is attributable to each sign being produced. It makes much more sense to classify that labor expense as indirect labor.

It is important to understand that the allocation of costs may vary from company to company. What may be a direct labor cost for one company may be an indirect labor cost for another company or even for another department within the same company. Deciding whether the expense is direct or indirect depends on its task. If the employee's work can be directly tied to the product, it is direct labor. If it is tied to the factory but not to the product, it is indirect labor. If it is tied to the marketing department, it is a sales and administrative expense, and not included in the cost of the product. For example, salaries of factory employees assembling parts are direct labor, salaries of factory employees performing maintenance are indirect labor, and salaries of employees in the marketing department are sales and administration expenses.

Overhead

The last category of manufacturing overhead is the overhead itself. These costs are necessary for production but not efficient to assign to individual product production. Examples of typical overhead costs are production facility electricity, warehouse rent, and depreciation of equipment.

But note that while production facility electricity costs are treated as overhead, the organization's administrative facility electrical costs are not included as as overhead costs. Instead, they are treated as period costs, as office rent or insurance would be.

When both administrative and production activities occur in a common building, the production and period costs would be allocated in some predetermined manner. For example, if a 10,000 square foot building were physically allocated at 4,000 square feet for administrative purposes and 6,000 square feet for production, a company might allocate its annual $30,000 property tax expense on a 40% ÷ 60% basis, or $12,000 as a period cost for the administrative offices and a production (overhead) cost of $18,000.

Accounting for Manufacturing Overhead

In all costing systems, the expense recognition principle requires costs to be recorded in the period in which they are incurred. The costs are expensed when matched to the revenue with which they are associated; this is commonly referred to as *having the expenses follow the revenues*. This explains why raw material purchases are not assigned to the job until the materials are requested. When companies use an inventory account, the product costs are expensed when the inventory is sold. It is common to have an item produced in

one year, such as 2017, and expensed as cost of goods sold in a later year, such as 2018. In addition to the previously mentioned *revenue recognition* treatment, this treatment is justified under GAAP's *matching principle*. If the inventory has not been sold, the company has an inventory asset rather than an expense.

The expense recognition principle also applies to manufacturing overhead costs. The manufacturing overhead is an expense of production, even though the company is unable to trace the costs directly to each specific job. For example, the electricity needed to run production equipment typically is not easily traced to a particular product or job, yet it is still a cost of production. As a cost of production, the electricity—one type of manufacturing overhead—becomes a cost of the product and part of inventory costs until the product or job is sold. Fortunately, the accounting system keeps track of the manufacturing overhead, which is then applied to each individual job in the overhead allocation process.

Managers use the information in the manufacturing overhead account to estimate the overhead for the next fiscal period. This estimated overhead needs to be as close to the actual value as possible, so that the allocation of costs to individual products can be accurate and the sales price can be properly determined.

Properly allocating overhead to the individual jobs depends on finding a cost driver that provides a fair basis for the allocation. A cost driver is a production factor that causes a company to incur costs. An example would be a bakery that produces a line of apple pies that it markets to local restaurants. To make the pies requires that the bakery incur labor costs, so it is safe to say that pie production is a cost driver. It should also be safe to assume that the more pies made, the greater the number of labor hours experienced (also assuming that direct labor has not been replaced with a greater amount of automation). We assume, in this case, that one of the

marketing advantages that the bakery advertises is 100% handmade pastries.

In traditional costing systems, the most common activities used as cost drivers are direct labor in dollars, direct labor in hours, or machine hours. Often in the production process, there is a correlation between an increase in the amount of direct labor used and an increase in the amount of manufacturing overhead incurred. If the company can demonstrate such a relationship, they then often allocate overhead based on a formula that reflects this relationship, such as the upcoming equation. In the case of the earlier bakery, the company could determine an overhead allocation amount based on each hour of direct labor or, in other cases, based on the ratio of anticipated total direct labor costs to total manufacturing overhead costs.

For example, assume that the company estimates total manufacturing overhead for the year to be $400,000 and the direct labor costs for the year to be $200,000. This relationship would lead to $2.00 of applied overhead for each $1.00 of direct labor incurred. The manufacturing overhead cost can be calculated and applied to each specific job, based on the direct labor costs. The formula that represents the overhead allocation relationship is shown, and it is the formula for overhead allocation:

$$\frac{\text{Estimated Annual Overhead Costs (\$)}}{\text{Expected Annual Activity (DL \$)}} = \text{Overhead Allocation Rate}$$

Figure 8.24 *By: Rice University OpenStax CC BY-NC-SA 4.0*

For example, Dinosaur Vinyl determined that the direct labor cost is the appropriate driver to use when establishing an overhead rate. The estimated annual overhead cost for Dinosaur Vinyl is $250,000. The total direct labor cost is

estimated to be $100,000, so the allocation rate is computed as shown:

$$\frac{\text{Estimated Annual Overhead Costs (\$250,000)}}{\text{Expected Annual Activity (\$100,000)}} = \text{\$2.50 per \$1.00 Direct Labor Expense}$$

Figure 8.25 *By: Rice University OpenStax CC BY-NC-SA 4.0*

Since the direct labor expense for MAC001 is $66, the overhead allocated is $66 times the overhead application rate of $2.50 per direct labor dollar, or $165, as shown:

Overhead Allocated = $66 (Direct Labor) × $2.50 (Overhead Application Rate) = $165

Figure 8.26 *By: Rice University OpenStax CC BY-NC-SA 4.0*

Figure 8.27 shows the journal entry to record the overhead allocation.

JOURNAL			
Date	**Account**	**Debit**	**Credit**
4/18/17	Work in Process Inventory Manufacturing Overhead *To assign overhead to Job MAC001*	165	165

Work in Process Inventory	
4/2/2017	520
4/5/2017	30
4/14/2017	180
4/15/2017	36
4/18/2017	165

Figure 8.27 Overhead Allocation*. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Long Descriptions

A T-account for Work In Process Inventory. Outside of the T-account is a label “Production costs” with arrows pointing to each of the components on the debit side of the T-account: “Direct Materials”, “Direct Labor”, and “Manufacturing Overhead.” The credit side of the T-account says “Transferred to Finished Goods Inventory” with an arrow pointing outside of the right side of the T account with the label “Finished goods inventory” Return

A Materials Requisition Form with the heading “Dinosaur Vinyl, Inc. The identifying lines are filled out: Materials requisition No. 3392, Job No.: MAC001, Date of Request: 4/5/2017, Date Needed: 4/5/2017. Below is a section with four columns labeled “Description”, “Quantity”, “Unit Cost”, and “Total Cost.” The rows say: “Raw materials inventory: Vinyl, 1, 300, 300; Raw materials inventory: Black ink, 2, 50, 100; Raw materials inventory: Red ink, 1, 60, 60; Raw materials inventory: Gold ink, 1, 60, 60; Raw materials inventory: Grommets, 12, 10, 120; Raw materials inventory: Framing wood, 40, 1.50, 60”. The Total Cost column shows “520.” Below are signatures for “Requested by” signed by John Ming and “Authorized by” signed by Isla Clark, both dated 4/5/17. Return

Six T-Accounts. The one headed “Raw Materials Inventory: Vinyl has three debit entries: Beginning inventory 1,000, 4/2/2017 10,000, Balance 11,000. The one headed Raw Materials Inventory: Black Ink has three debit entries: Beginning inventory 300, 4/2/2017 500, Balance 800. The one headed Raw Materials Inventory: Red Ink has two debit entries: Beginning inventory 300, Balance 300. The one headed Raw Materials Inventory: Gold Ink has two debit entries: Beginning inventory 300, Balance 300. The one headed Raw Materials Inventory: Grommets has two debit entries: Beginning inventory 120, Balance 120. The one headed Raw Materials Inventory: Framing

Wood has two debit entries: Beginning inventory 60, Balance 60. Return

A five column chart showing the cost of the direct materials used. The headings are “Item”, “Units”, “Cost per Unit”, “Item Cost”, and “Total Cost.” The figures are divided by department. The Production Department rows are: Vinyl, 1,$300, $300; Black ink, 2, 50, 100; Red ink, 1, 60, 60; Gold ink, 1, 60, 60. The item cost is then totaled in the total cost column as $520. The Finishing Department rows are: Grommets, 12, $10, $120; and Framing Wood, 40, 1.50, 60. The item cost is then totaled in the total cost column as 180. The total cost for the two departments is then totaled as $700 for the Total Direct Materials. Return

Seven T-accounts: The one headed “Raw Materials Inventory: Vinyl” has two debit entries: Beginning inventory 1000, 4/2/2017 10,000, one credit entry: 4/2/2017 300, and a debit Balance of 300. The one headed “Raw Materials Inventory: Black Ink” has two debit entries: Beginning inventory 300, 4/2/2017 500, one credit entryside: 4/2/2017 100, and a debit Balance of 700. The one headed “Raw Materials Inventory: Red Ink” has a debit: Beginning inventory 300, one credit entry: 4/2/2017 60, and a debit Balance of 240. The one headed “Raw Materials Inventory: Gold Ink” has a debit: Beginning inventory 300, one credit: 4/2/2017 60, and a debit Balance of 240. The one headed “Raw Materials Inventory: Grommets” has a debit: Beginning inventory 300, one credit entry: 4/14/2017 120, and a debit Balance of 180. The one headed “Raw Materials Inventory: Wood” has a debit: Beginning inventory 300, two credit entries: “used in other jobs 200” and 4/14/2017 60, and a debit Balance of 40. The one headed “Work in Process Inventory” has two debit entries: 4/2/2017 520, and 4/14/2017 180. Return

A five column chart calculating the Direct Labor. The headings are: “Item”, “Hours”, “Rate per Hour”, “Item Cost”, and “Total Cost.” The figures are divided by department. The Production Department rows are: Material Handler, 1, $15, $15; Print Technician, 1, 15, 15. The item cost is then totaled in the

total cost column as $30. The Finishing Department rows are: Production Assistant, 1, $18, $18; Production Assistant, 1, $18, $18. The item cost is then totaled in the total cost column as $36. The total cost for the two departments is then totaled as $66 for the Total Direct Labor. Return

Three forms labeled “Employee Time Ticket.” They each have a place to fill out the Employee Name, Department, Employee ID, and Date. Then there are four columns the form with headings: “Job No.”, “Hours Worked”, “Hourly Rate”, and “Total Cost”. The first ticket is Renee Chelsea, material handler, ID# 12842, 4/5/2017 with the following information: MAC001 1, 15, 15; POR143, 7,15,105. Her total cost is added to be 120. The second ticket is Raymond Santiago, Print Technician, ID#23133, 4/5/2017 with the following information: MAC001 1, 15, 15; TJR441 4, 15, 60, POR143, 3, 15, 45. His total is 120. The last ticket is Rani Fina, Finishing/Assembly, ID#13353, 4/15/2017 with the following information: MAC001, 2, 18, 36; TJR441 5, 18, 90; POR143, 1, 18, 18; for a total of 144. Each ticket has a place on the bottom to be authorized with a signature and a date. Return

A journal entry dated 4/18/17 lists Work in Process Inventory with a debit of 165, Manufacturing Overhead with a credit of 165, and the note “To assign overhead to Job MAC0001. A T-account for “Work in Process Inventory” with five debit entries: 4/2/2017 520, 4/5/2017 30, 4/10/2017 30, and 4/15/2017 36, 4/18/2017 165. Return

8.4 Tracing the Flow of Costs in Job Order

Job order costing can be used for many different industries, and each industry maintains records for one or more inventory accounts. The manufacturing industry keeps track of the costs of each inventory account as the product is moved from raw materials inventory into work in process, through work in process, and into the finished goods inventory.

Conversely, typical companies in the merchandising industry sell products they do not manufacture and purchase their inventory in an already completed state. It is relatively easy to keep track of the inventory cost for a merchandising company through its application of first-in/first-out (FIFO), last-in/last-out (LIFO), weighted average, or specific identification inventory techniques on the unsold items. The primary difference in the four methods is the valuation of the cost of goods sold and the remaining ending inventory valuation, assuming that the company did not sell 100% of the inventory that they had available for sale during a given period. Companies are allowed to choose the method that they feel best represents their cost flows through their cost of goods sold and their ending inventory balances.

Not all service companies have inventory, and those companies do not have direct materials nor do they consider their work in process their inventory, since their final product is often an intangible asset, such as a legal document or tax return. Regardless of whether the service has inventory accounts, service companies all keep track of the direct labor and overhead costs incurred while completing each job in progress.

Inventory is an asset reported on the balance sheet, and each

company needs to maintain accurate records for the cost of each type of inventory: raw materials inventory, work in process inventory, and finished goods inventory. All three costs are computed in a similar manner. You can see in Figure 8.28 that the general format is the same for maintaining all accounts, whether the company uses a job order, process, or hybrid cost system.

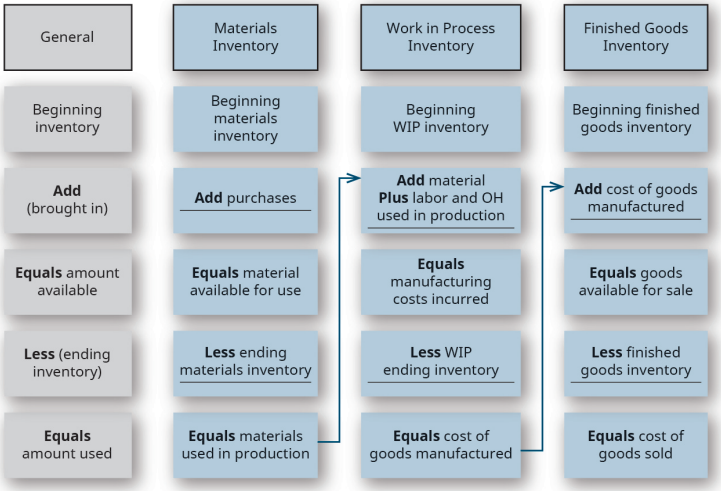


Figure 8.28 Cost of Inventory Accounts. *Inventory is accounted for across the flow through production. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Each inventory account starts with a beginning balance at the start of an accounting period. During the period, if additional inventory is purchased, the new inventory amount is added to the beginning balance to calculate the total inventory available for use or sale. The ending inventory balance at the end of the accounting period can then be subtracted from the inventory available for use, and the total represents the cost of the inventory used during the period.

For example, if the beginning inventory balance were $400, and the company bought an additional $1,000, it would have $1,400 of inventory available for use. If the ending inventory balance were $500, the amount of inventory used during the period would be $900 ($400 + $1,000 = $1,400 – $500 = $900).

Raw Materials Inventory

Raw materials inventory is the total cost of materials that will be used in the production process. Usually, several accounts make up the raw materials inventory, and these can be actual accounts or accounts subsidiary to the general raw materials inventory account. In our example, Dinosaur Vinyl has several raw materials accounts: vinyl, red ink, black ink, gold ink, grommets, and wood.

Within the raw materials inventory account, purchases increase the inventory, whereas raw materials sent into production reduce it. It is easy to reconcile the amount of ending inventory and the cost of direct materials used in production, since the materials requisition form (Figure 8.29) keeps track of the inventory requested and sent into each specific job. Since the costs are transferred with production, the calculation shows the amount of materials used in production:

Beginning materials inventory
+ Net materials purchased
= Materials available for use
− Ending raw materials inventory
= Materials used in production

Note: this equation can be easily modified with algebra to compute the cost of the ending raw materials inventory.

Materials available for use
− Materials used in production
= Ending raw materials inventory

Figure 8.29 *By: Rice University OpenStax CC BY-NC-SA 4.0*

Work in Process Inventory

In a job order cost system, the balance in the work in process inventory account is continually updated as job costs are recorded and is the total of all unfinished jobs, as shown on the individual job cost sheets.

The production cycle is a continuous cycle that begins with raw materials being transferred to work in process, moving through production, and ending as finished goods inventory. Typically, as goods are being produced, additional jobs are being started and finished, and the work in process inventory includes unit costs of jobs still in production at the end of the accounting period. At the end of the accounting cycle, there will be jobs that remain unfinished in the production cycle, and these represent the work in process inventory. The costs on the job order cost sheet help reconcile the cost of the items transferred to the finished goods inventory and the cost of the work in process inventory.

For example, Dinosaur Vinyl has completed Job MAC001. The total cost of $931 is transferred to the finished goods inventory:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Finished Goods Inventory	931	
	Work in Process Inventory		931
	To transfer Job MAC001 to Finished Goods		

Figure 8.30 *By: Rice University OpenStax CC BY-NC-SA 4.0*

At this point, we need to examine an important component of the costing process. The cost of goods manufactured (COGM) is the costs of all of the units that a company completed and transferred to the finished goods inventory during an accounting period. Obviously, the cost of goods manufactured is not just a single number that can be pulled from one

location. We have to look at all costs included in the manufacturing process to determine the cost of goods manufactured. The calculation begins with the beginning balance in the work in process inventory, incorporates the new production costs incurred during the current period (typically a year), and then subtracts the ending balance in the work in process inventory since these costs will be included in the subsequent accounting period's cost of goods manufactured, as shown:

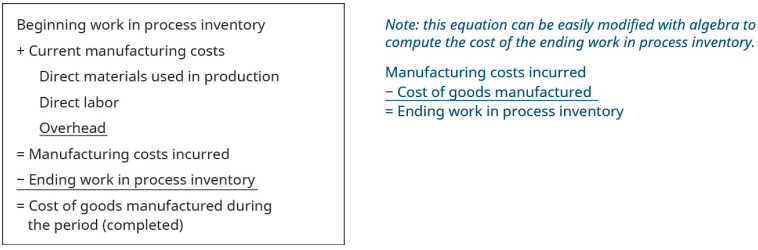


Figure 8.31 *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

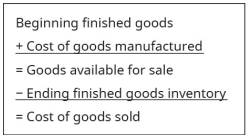
Finished Goods Inventory

After each job has been completed and overhead has been applied, the product is transferred to the finished goods inventory where it stays until it is sold. As each job is transferred, the costs are summarized and transferred as well, and the job cost sheet is completed to show the actual production cost of the product and the sales price of the items produced.

A job order cost system continually updates each job cost sheet as materials, labor, and overhead are added. As a result, all inventory accounts are constantly maintained. The materials inventory balance is continually updated, as materials are purchased and requisitioned for individual jobs. The work in

process inventory and finished goods inventory are master accounts, and their balances are determined by adding the total of the job cost sheets. The total of the incomplete jobs becomes the total work in process inventory, and the total of the completed and unsold jobs becomes the total of the finished goods inventory.

Similar to the raw materials and work in process inventories, the cost of goods sold can be calculated as shown:



Note: this equation can be easily modified with algebra to compute the cost of the finished goods inventory.

Cost of goods available for sale
− Cost of goods sold
= Ending finished goods inventory

Figure 8.32 *By: Rice University OpenStax CC BY-NC-SA 4.0*

Cost of Goods Sold

The cost of goods sold is the manufacturing cost of the items sold during the period. It is calculated by adding the beginning finished goods inventory and the cost of goods manufactured to arrive at the cost of goods available for sale. The cost of goods available for sale less the ending inventory results in the cost of goods sold.

In our example, when the sale has occurred, the goods are transferred to the buyer, and the product is transferred from the finished goods inventory to the cost of goods sold. A corresponding entry is also made to record the sale. Dinosaur Vinyl's sales price for Job MAC001 was $2,000, and its cost of goods sold was $931:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cost of Goods Sold	931	
	Finished Goods Inventory		931
	To transfer sold Job MAC001		
	Accounts Receivable	2,000	
	Sales		2,000
	To record sale of Job MAC001		

Figure 8.33 *By: Rice University OpenStax CC BY-NC-SA 4.0*

Figure 8.34 shows the flow to cost of goods sold.

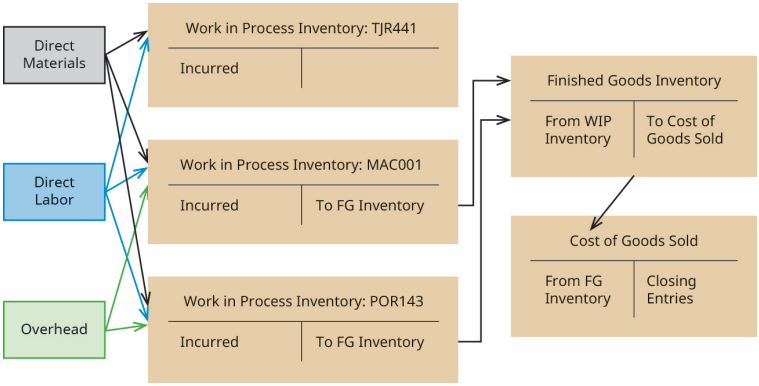


Figure 8.34 Flow of Manufacturing Costs under the Job Order Costing Method. *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

YOUR TURN

Tracking the Flow with Selected T-Accounts

Use the transaction letters to show the flow in and out of the T-accounts. Note: some items may be used more than once. Also, not every possible T-account entry is required in this exercise. For example, for the purchase of raw materials, the credit entry for either cash or accounts payable is not required.

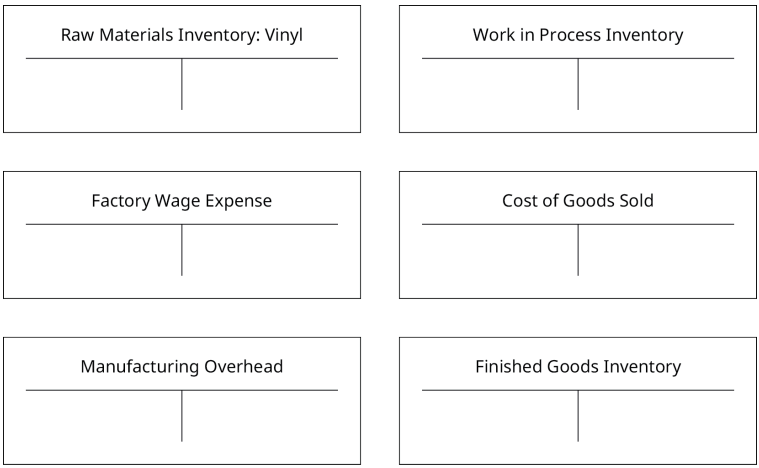


Figure 8.35 *By: Rice University OpenStax CC BY-NC-SA 4.0*

A. Purchase raw materials inventory
B. Factory wage expense incurred
C. Issue raw materials inventory to Job P33
D. Factory wage allocated to Job P33
E. Factory wage allocated to overhead
F. Job P33 completed
G. Job P33 sold

Solution

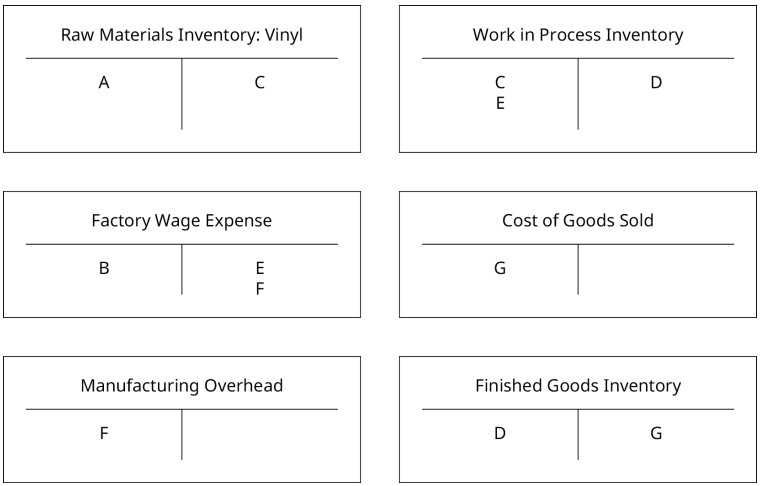


Figure 8.36 *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Long Descriptions

A figure of four columns showing the similarity of the calculation of each level of inventory as it moves to the next level. The far left column is the general calculation: Beginning Inventory plus what is brought in equals what is available. Then subtract the ending inventory (what is left) to get the amount used. The next column is this same calculation for Materials inventory: Beginning Raw Materials Inventory plus purchases equals material available for use. Then subtract Ending Raw Materials Inventory to get Materials used in production. There is an arrow from this result pointing to the amount that is added to the Work in Process Inventory, which is the next column's

calculation: Beginning WIP Inventory plus material (from the arrow), labor, and overhead used in production equals Manufacturing Costs Incurred. Then subtract the ending WIP Inventory to get the Cost of goods Manufactured. There is an arrow pointing from this result to the amount that is added to the Finished Goods Inventory, which is calculated in the next column: Beginning Finished Goods Inventory plus Cost of Goods Manufactured (from the arrow) equals Goods Available for Sale. Then subtract Ending Finished Goods Inventory to get Cost of Goods Sold. Return

This figure calculates Cost of goods manufactured during the period (completed): Beginning Work in Process Inventory plus the current manufacturing costs (Direct Materials used in production, Direct Labor, and Overhead) equals Manufacturing costs incurred. Then subtract the ending Work in Process inventory to get Cost of Goods Manufactured. Return

A figure showing the flow of costs. There are three small boxes on the left indicating “Direct Materials”, “Direct Labor” and “Overhead.” There are arrows from each of these boxes to the debit side of each of the T-Accounts showing in the middle column: “Work in Process Inventory: TJR441”, “Work in Process Inventory: MAC001” and “Work in Process Inventory: POR143” – with the exception of overhead to TR441 (which has not yet been finished.) The debit side of each of these T-accounts say “Incurred” in them. The credit side of the T-accounts for MAC001 and POR143 say “To Finished Goods Inventory” and there are arrows pointing from each to the debit side of a T-Account for “Finished Goods Inventory,” which says “From WIP Inventory.” The credit side of the Finished Goods Inventory T-Account says “To Cost of Goods Sold” and there is an arrow pointing from that to the debit side of a T-Account Labeled “Cost of Goods Sold”. This T-Account has the words “From Finished Goods Inventory” on the debit side and “Closing Entries” on the credit side. Return

The six T-Accounts: one each for “Raw Materials Inventory:

Vinyl", "Factory Wage Expense", "Manufacturing Overhead", "Work in Process Inventory", "Cost of Goods Sold", and "Finished Goods Inventory" are now filled out. "Raw Materials Inventory: Vinyl" has an A on the debit side and a C on the credit side, "Factory Wage Expense" has a B on the debit side, and an E and F on the credit side, "Manufacturing Overhead" has an F on the debit side, "Work in Process Inventory" has a C and E on the debit side and a D on the credit side, "Cost of Goods Sold" has a G on the debit side, and "Finished Goods Inventory" has a D on the debit and G on the credit side. Return

8.5 Predetermined Overhead Rates & Overhead Application

Job order cost systems maintain the actual direct materials and direct labor for each individual job. Since production consists of overhead—indirect materials, indirect labor, and other overhead—we need a methodology for applying that overhead. Unfortunately, the nature of indirect material, indirect labor, and other overhead expenses makes it impossible to determine the exact amount of overhead for each specific job. For example, how do you know the cost of electricity and heat for manufacturing one job? And, if you did, is it fair to say products manufactured in January are more expensive than the same product manufactured in March because of heat expense?

Fundamental Characteristics of the Overhead Determination Environment

Added to these issues is the nature of establishing an overhead rate, which is often completed months before being applied to specific jobs. Establishing the overhead allocation rate first requires management to identify which expenses they consider manufacturing overhead and then to estimate the manufacturing overhead for the next year. Manufacturing overhead costs include all manufacturing costs except for direct materials and direct labor. Therefore, in order to estimate manufacturing overhead, management must estimate the

future purchase prices of dozens, or sometimes hundreds, of individual components, such as utilities, raw materials, contract labor, or diesel fuel. Estimating overhead costs is difficult because many costs fluctuate significantly from when the overhead allocation rate is established to when its actual application occurs during the production process. You can envision the potential problems in creating an overhead allocation rate within these circumstances.

Before demonstrating the calculation of a predetermined overhead allocation rate, let's review the basic principles of revenue recognition and expense. In accounting, there are three ways to recognize expenses:

1. Direct relationship between the expense and the associated revenue. This method is used for many costs, and the expense is recognized when a direct relationship exists. For example, sales commission expenses can be directly traced to product sales, and a commission expense is recorded when a sale is made.
2. Systematic and rational allocation of expenses. This approach is used when costs exist and there is an expected benefit, even though the costs cannot be directly traced to the benefit. The assigning of expenses to a product or time period must be done in an objective and consistent manner. Examples of such expenses would include equipment rental for a factory or property insurance for the factory.

   Both of these expenses (direct relationship and systematic and rational) are also examples of the types of expenses that compose manufacturing overhead. An example of the current revenue recognition principle is a company paying $4,800 a year for property insurance. Since production rates can vary month to month, most producers would allocate $400 each month for property insurance, and this cost would be incorporated into the total overhead costs

anticipated when estimating a manufacturing overhead allocation rate.

The direct benefit is that the product will be sold and the revenue recognized. The overhead is associated but cannot be directly traced to an individual product, so the overhead expenses need to be assigned in a systematic and rational manner.

3. Immediate recognition. This method is used when expenses exist but there is no direct expected benefit. In this case, the expense is recognized immediately. For example, research and development costs are necessary expenses but cannot be traced to a specific product, so they are expensed as incurred.

The allocation of overhead to the cost of the product is also recognized in a systematic and rational manner. The expected overhead is estimated, and an allocation system is determined. The actual costs are accumulated in a manufacturing overhead account. The overhead is then applied to the cost of the product from the manufacturing overhead account. The overhead used in the allocation is an estimate due to the timing considerations already discussed.

The application rate that will be used in a coming period, such as the next year, is often estimated months before the actual overhead costs are experienced. Often, the actual overhead costs experienced in the coming period are higher or lower than those budgeted when the estimated overhead rate or rates were determined. At this point, do not be concerned about the accuracy of the future financial statements that will be created using these estimated overhead allocation rates.

Despite improvements in technology and information flow, using the actual overhead to calculate the application rate is usually not possible because the actual overhead information is available too late for management to make decisions. Also, as you will learn, the results of the actual overhead costs, if

they were available, could be misleading. Therefore, most manufacturing companies use predetermined overhead rates for these reasons:

- Overhead costs are not uniform throughout the year. An example is electricity costs that vary by weather and time of day.
- Some overhead costs are fixed, and the cost per unit varies with production. For example, rent may be $1,000 per month. If 500 units were made during one month, and 2,000 units were made the next month, the cost per unit would vary from $2 per unit to $0.50 per unit.
- The total number of units produced varies and is often known sooner than the cost of overhead. For example, a company may know it will have a contract to produce 100 custom units long before it knows the utility costs for the next year.

As previously described, a predetermined overhead rate is established prior to the beginning of the fiscal year and typically is not changed during the year. The predetermined rate is calculated as shown and is used to apply overhead costs to work in process:

$$\frac{\text{Estimated (budgeted) Overhead Cost}}{\text{Expected (budgeted) Level of Activity}} = \text{Predetermined Overhead Rate}$$

Figure 8.37 *By: Rice University OpenStax CC BY-NC-SA 4.0*

CONCEPTS IN PRACTICE

Overhead in the Movie Industry

The movie industry uses job order costing, and studios need to allocate overhead to each movie. Their amount of allocated overhead is not publicly known because while publications share how much money a movie has produced in ticket sales, it is rare that the actual expenses are released to the public.

It has been speculated that *Star Wars: The Force Awakens* cost $201,000,000, with $30,000,000 considered overhead. Studios have estimated that the higher the movie expenses, the more studio overhead is required, and it has also been estimated that 10% of the total cost is assigned to studio overhead.

Determining Estimated Overhead Cost

The estimated or budgeted overhead is the amount of overhead determined during the budgeting process and consists of manufacturing costs but, as you have learned, excludes direct materials and direct labor. Examples of manufacturing overhead costs include indirect materials, indirect labor, manufacturing utilities, and manufacturing equipment depreciation. Another way to view it is overhead costs are those production costs that are not categorized as direct materials or direct labor.

Selecting an Estimated Activity Base

As you have learned, the overhead needs to be allocated to the manufactured product in a systematic and rational manner. This allocation process depends on the use of a cost driver, which drives the production activity's cost. Examples can include labor hours incurred, labor costs paid, amounts of materials used in production, units produced, or any other activity that has a cause-and-effect relationship with incurred costs.

Direct labor hours, direct labor dollars, or machine hours are often chosen as the allocation base because those costs are associated with each product, and as the activity increases, so does the manufacturing overhead. In other words, the products that involve more direct labor hours, direct labor dollars, or machine hours also increase utility expenses, supervisor time (and thus indirect labor), equipment usage and the related depreciation expense, and so forth.

Traditionally, direct labor hours were used as the activity base, but technology continually decreases the amount of direct labor used in production, and machine hours or units produced have become more common activity bases. Management analyzes the costs and selects the activity as the estimated activity base because it drives the overhead costs of the unit.

Computing a Predetermined Overhead Rate

Dinosaur Vinyl uses the expenses from the prior two years to estimate the overhead for the upcoming year to be $250,000, as shown in Figure 8.38.

	Annual Estimate
Indirect labor	$ 5,000
Indirect materials	20,000
Utilities	75,000
Depreciation	90,000
Insurance	35,000
Interest expense	25,000
	$250,000

Figure 8.38 Dinosaur Vinyl's Estimated Overhead. *By: Rice University OpenStax CC BY-NC-SA 4.0*

Dinosaur Vinyl also used its payroll records to estimate that it will spend $100,000 on direct labor. Using the predetermined overhead rate calculation, the overhead rate is $2.50 per direct labor dollar:

	Annual Estimate
Indirect labor	$ 5,000
Indirect materials	20,000
Utilities	75,000
Depreciation	90,000
Insurance	35,000
Interest expense	25,000
	$250,000

Figure 8.39 *By: Rice University OpenStax CC BY-NC-SA 4.0*

Over the fiscal year, the actual costs are recorded as debits into the account called manufacturing overhead. When the overhead is applied to the jobs, the amount is first calculated using the application rate. If the total labor paid for the job is $66, the overhead applied to the job is $2.50 times that

amount, or $165. The entry to record the overhead for Job MAC001 is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Work in Process Inventory	165	
	Manufacturing Overhead		165
	To apply overhead to Job MAC001		

Figure 8.40 *By: Rice University OpenStax CC BY-NC-SA 4.0*

That amount is added to the cost of the job, and the amount in the manufacturing overhead account is reduced by the same amount. At the end of the year, the amount of overhead estimated and applied should be close, although it is rare for the applied amount to exactly equal the actual overhead. For example, Figure 8.41 shows the monthly costs, the annual actual cost, and the estimated overhead for Dinosaur Vinyl for the year. While the total amounts are close to each other, they are not exact.

	Monthly Actual	Annual Amount	Annual Estimate
Indirect labor	$ 375	$ 4,500	$ 5,000
Indirect materials	1,500	18,000	20,000
Utilities	7,000	84,000	75,000
Depreciation	7,500	90,000	90,000
Insurance	2,917	35,000	35,000
Interest expense	2,083	25,000	25,000
	$21,000	$256,500	$250,000

Figure 8.41 Dinosaur Vinyl's Actual and Estimated Overhead*. While the total amounts are close to each other, they are not an exact match. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Calculating Manufacturing Overhead Cost

for an Individual Job

Figure 8.41 shows the monthly manufacturing actual overhead recorded by Dinosaur Vinyl. As explained previously, the overhead is allocated to the individual jobs at the predetermined overhead rate of $2.50 per direct labor dollar when the jobs are complete. When Job MAC001 is completed, overhead is $165, computed as $2.50 times the $66 of direct labor, with the total job cost of $931, which includes $700 for direct materials, $66 for direct labor, and $165 for manufacturing overhead.

Long Description

A three column chart showing the Monthly Actual, the Annual Amount, and the Annual Estimate of the overhead. The rows are: Indirect labor 375, 4,500, and 5,000; Indirect materials 1,500, 18,000, and 20,000; Utilities 7,000, 84,000, and 75,000; Depreciation 7,500, 90,000, and 90,000; Insurance 2,917, 35,000, and 35,000; Interest Expense 2,083, 25,000, and 25,000. The totals of the columns are $21,000, $256,500, and $250,000. Return

8.6 Calculating the Cost of a Job

Determining the Costs of an Individual Job Using Job Order Costing

When a job is completed, the costs of the job—the direct materials, direct labor, and manufacturing overhead—are totaled on the job cost sheet, and the total amount is transferred to finished goods at the same time the product is transferred, either physically or legally, such as in the case of a home built by a contractor. Finally, when the product is sold, the sale is recorded at the sale price, while the cost is transferred from finished goods inventory to the cost of goods sold expense account. Figure 8.42 shows the flow of costs from raw materials inventory to cost of goods sold.

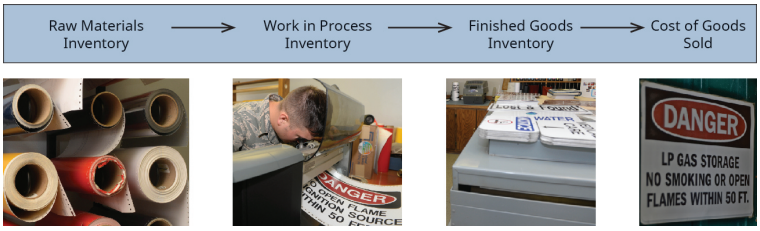


Figure 8.42 Flow of Costs during Production and Ultimate Sale or Transfer of Ownership. *(credit "Raw Materials Inventory," "Work in Process Inventory," "Finished Goods Inventory": modifications of "160810-F-UY190-027.JPG," "160810-F-UY190-073.JPG," and "160810-F-UY190-105.JPG" by Jessica Weissman, Minot Air Force Base Public Affairs, Public Domain; credit Cost of Goods Sold": "Rustic Sign" By Grace Byrd Flickr CC BY 2.0*

At all points in the process, the work in process should include

the cost of direct materials and direct labor. When the job is completed and overhead assigned, the overhead allocation increases the cost of the work in process inventory. The cost of each individual job is maintained on a job cost sheet, and the total of all the work in process job cost sheets equals the work in process inventory and the statement of cost of goods manufactured, as you have learned.

A job cost sheet is a subsidiary ledger that identifies the individual costs for each job. Figure 8.43 shows the job cost sheet for Job MAC001.

JOB COST SHEET
Dinosaur Vinyl, Inc.

Job No.: 5416	**Customer No.:** 2501723
Customer: Macs & Cheese	**Date Started:** Dec. 22, 2018
Units Ordered: 1	**Date Completed:** Feb. 22, 2019

Direct Material	Units	Price	Amount
Vinyl	1	$300	$ 300
Black printing ink	2	50	100
Red printing ink	1	60	60
Gold printing ink	1	60	60
Grommets	12	10	120
Framing wood	40	1.5	60
Total Direct Materials			$ 700
Direct Labor	**Hours**	**Wage Rate**	**Amount**
Material Handler	1	$ 15	$ 15
Print Technician	1	15	15
Production Assistants	2	18	36
Total Direct Labor			$ 66
Manufacturing Overhead	**Base Units**	**Rate**	**Amount**
Direct Labor Cost	66	$ 2.5	$ 165
Total Manufacturing Overhead			$ 165
Total Job Cost			$ 931
Total Revenue			$2,000

Figure 8.43 Job Cost Sheet for Job MAC001*. By: Rice University OpenStax CC BY-NC-SA 4.0 A Long Description is below.*

Long Description

A Job Cost Sheet. Headings are JOB COST SHEET, Dinosaur Vinyl, Inc. Identifying information is Job No.: 5416, Customer: Macs & Cheese, Units Ordered: 1, Customer No.:

2501723, Date Started: Dec. 22, 2018, Date Completed: Feb. 22, 2019 Costs are shown in 4 columns: Cost classifications, Units, Cost per Unit, and Amount. Direct Materials Costs are: Vinyl, 1, 300, 300; Black printing ink 2, 50, 100; Red printing ink 1, 60, 60; Gold printing ink 1, 60, 60; Grommets 12, 10, 120; Framing wood 40, 1.50, 60; for a total Direct materials of $700. Direct Labor Costs are: Material Handler 1, 15, 15; Print Technician 1, 15, 15; Production Assistants 2, 18, 36; for a total Direct Labor Cost of 66. Manufacturing Overhead Allocation Base: Direct Labor Cost. Base Units 66, Rate is $1.50 for a total overhead allocation of $165. Total job cost is $931.Total Revenue is $2000.



One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=1379#oembed-1

Sample Cost Information for Dinosaur Vinyl

Dinosaur Vinyl worked on three jobs during the month: POR143, MAC001, and TRJ441, and a fourth Job SWM505 had been finished and moved to the finished goods inventory account during the previous month.

At the beginning of the month, the company had a beginning raw materials inventory balance of $2,500, and

during the month, it purchased an additional $10,500, giving it a total of $13,000 in raw materials available for use in production.

The following example will examine four different production jobs. Each of the four will be at beginning stages at either the beginning of the current month or the end of the current month.

1. Job POR 143: This job was the only work in process inventory at the beginning of the current month, and it had $1,000 in direct material costs, and $0 of direct labor costs already allocated to the work in process inventory. During the current month, additional direct materials of $200 and direct labor of $150 were added to POR143. An overhead cost of $375 was applied to POR143 at the predetermined overhead rate of $2.50 per direct labor dollar. It was finished during the month and transferred to the finished goods inventory. The sale was not finalized during the month, so it continues to be part of the finished goods inventory.
2. Job MAC 001: This job was started and completed during the month. Since the job began in and was completed in the same month, there was no beginning balance in the work in process inventory. During the month it incurred $700 in direct materials costs, $66 in direct labor, and $165 of overhead applied to the job before it was transferred to the finished goods inventory upon completion. The sale was finalized during the month at a sale price of $2,000, so the costs were transferred from finished goods inventory to cost of goods sold.
3. Job TRJ441: This job was started during the current month. Its costs consist of $500 in direct material cost, $150 in direct labor expenses, and $375 in applied overhead. The job remains in the work in process inventory awaiting assembly.

4. Job SWM505: At the beginning of the month, this job was completed and already in the finished goods inventory at a cost of $1,531. Since it was completed, it did not incur any additional costs in the current month. It was sold during the month for $3,500, and the costs were transferred from the finished goods inventory to cost of goods sold.

The cost of raw materials used is calculated as shown:

Beginning RM inventory	$ 2,500
Purchases	10,500
Materials available for use	13,000
Ending RM inventory	11,600
Materials used in production	$ 1,400

Figure 8.44 *By: Rice University OpenStax CC BY-NC-SA 4.0*

The individual job cost sheets show the $1,400 worth of materials used in production:

POR143	$ 200
MAC001	700
TJR441	500
	$1,400

Figure 8.45 *By: Rice University OpenStax CC BY-NC-SA 4.0*

The cost of goods manufactured is accounted for as shown:

	POR143	MAC001	TJR441	Total
Materials added	$200	$700	$ 500	$1,400
Labor added	150	66	150	366
Overhead applied	375	165	375	915
Total added during month	$725	$931	$1,025	$2,681

	POR143	MAC001	TJR441	Total
Beginning WIP inventory	$1,000	$ 0	$ 0	$1,000
Materials, labor, & OH added	725	931	1,025	2,681
Manufacturing costs incurred	1,725	931	1,025	3,681
Ending WIP inventory	0	0	1,025	1,025
Cost of Goods Manufactured	$1,725	$931	$ 0	$2,656

Figure 8.46 *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Notice the costs for Job TJR441 are included in the work in process inventory, whereas the costs for POR143 and MAC001 were transferred to the cost of goods manufactured. The costs of the jobs transferred are shown in the cost of goods sold and the finished goods inventory:

	SWM505	POR143	MAC001	TJR441	Total
Beginning FG inventory	$1,531	$ 0	$ 0	$0	$1,531
Cost of Goods Manufactured	0	1,725	931	0	2,656
Goods Available for Sale	1,531	1,725	931	0	4,187
Ending FG inventory	0	1,725	0	0	1,725
Cost of Goods Sold	$1,531	$ 0	$931	$0	$2,462

Figure 8.47 *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Mechanics of Job Order Costing for Dinosaur Vinyl

The amounts in raw materials, work in process, and finished goods inventories compose the total cost for each account, whereas the job cost sheets contain the costs for each individual job. A summary of the jobs for Dinosaur Vinyl is given in Figure 8.48.

	SWM505	POR143	MAC001	TJR441	Total
Beginning balance	$1,531	$1,000	$ 0	$ 0	$2,531
Direct materials		200	700	500	1,400
Direct labor		150	66	150	366
Overhead applied		375	165	375	915
Total cost	$1,531	$1,725	$931	$1,025	$5,212
Status	Sold	Finished	Sold	Unfinished	
Final account location	COGS	FG	COGS	WIP	



Figure 8.48 Summary of Dinosaur Vinyl's Jobs during the Year. *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Long Descriptions

A chart showing the calculation of Cost of Goods Manufactured for jobs POR143, MAC001, TJR441 and the Total. Respectively: Materials added are $200, $700, $500, and $1400; Labor added is 150, 66, 150, and 366; Overhead applied is 375, 165, 375, and 915; for Total added during the month of $725, $931, $1,025, and $2,681. Calculation is Beginning WIP Inventory of $1,000, $0, $0, and $1,000; Material, Labor, and Overhead added is 725, 931, 1,025, and 2,681; Equaling Manufacturing costs incurred of 1,725, 931, 1,025, and 3,681. Subtract Ending WIP Inventory of 0, 0, 1,025, and 1,025; Equaling Cost of Goods Manufactured of $1,725, $931, $0, and $2,656. Return

Chart showing Cost of Goods Sold for SWM505 POR143, MAC001, TJR441, and the Total. Respectively the dollar figures are: Beginning Finished Goods Inventory 1,531, 0, 0, 0, 1,531; plus Cost of Goods Manufactured 0, 1,725, 931, 0, 2,656; equaling Goods Available for Sale 1,531, 1,725, 931, 0, 4,187. Then subtract Ending Finished Goods Inventory of 0, 1,725, 0, 0, and 1,725 to get Cost of Goods Sold of 1,531, 0, 931, 0, and 2,462. Return

Chart showing a summary of the Jobs: SWM505, POR143, MAC001, TJR441, and Total. Beginning Balance $1,531, 1,000, 0, 0, 2,531 (which is the Beginning WIP for the company) plus Direct Materials 0, 200, 700, 500, and 1,400 plus Direct Labor 0, 150, 66, 150, 366 plus Overhead applied 0, 375, 165, 375, and

915 equals total cost of 1,531, 1,725, 931, 1,025, and 5,212 (which is Total for WIP, FG, and CGS) Status is Sold, Finished, Sold, and Unfinished, Final account location is Cost of Goods Sold, Finished Goods Inventory, cost of Goods Sold, and WIP Inventory. Return

8.7 Job Order Journal Entries

Journal Entries to Move Direct Materials, Direct Labor, and Overhead into Work in Process

Dinosaur Vinyl keeps track of its inventory and orders additional inventory to have on hand when the production department requests it. This inventory is not associated with any particular job, and the purchases stay in raw materials inventory until assigned to a specific job. For example, Dinosaur Vinyl purchased an additional $10,000 of vinyl and $500 of black ink to complete Macs & Cheese's billboard. If the purchase is made on account, the entry is as shown:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Raw Materials Inventory: Vinyl Raw Materials Inventory: Black ink Accounts Payable *To record purchase of vinyl and ink inventory*	10,000 500	 10,500

Figure 8.49 *By: Rice University Openstax CC BY NC SA 4.0*

As shown in Figure 8.49, for the production process for job MAC001, the job supervisor submitted a materials requisition form for $300 in vinyl, $100 in black ink, $60 in red ink, and $60 in gold ink. For the finishing process for Job MAC001, $120 in grommets and $60 in finishing wood were requisitioned. The entry to reflect these actions is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Work in Process Inventory	700	
	Raw Materials Inventory: Vinyl		300
	Raw Materials Inventory: Black ink		100
	Raw Materials Inventory: Red ink		60
	Raw Materials Inventory: Gold ink		60
	Raw Materials Inventory: Grommets		120
	Raw Materials Inventory: Finishing wood		60
	To record requisition of vinyl and ink inventory		

Figure 8.50 *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

The production department employees work on the sign and send it over to the finishing/assembly department when they have completed their portion of the job.

The direct cost of factory labor includes the direct wages paid to the employees and all other payroll costs associated with that labor. Typically, this includes wages and the payroll taxes and fringe benefits directly tied to those wages. The accounting system needs to keep track of the labor and the other related expenses assigned to a particular job. These records are typically kept in a time ticket submitted by employees daily.

On April 10, the labor time sheet totaling $30 is recorded for Job MAC001 through this entry:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Work in Process Inventory (MAC001)	30	
	Factory Wages Payable		30
	To record labor for Job MAC001		

Figure 8.51 *By: Rice University Openstax CC BY NC SA 4.0*

The assembly personnel in the finishing/assembly department complete Job MAC001 in two hours. The labor is recorded as shown:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Work in Process Inventory	36	
	Factory Wages Payable		36
	To record labor for Job MAC001		

Figure 8.52 *By: Rice University Openstax CC BY NC SA 4.0*

Indirect materials also have a materials requisition form, but the costs are recorded differently. They are first transferred into manufacturing overhead and then allocated to work in process. The entry to record the indirect material is to debit manufacturing overhead and credit raw materials inventory.

Indirect labor records are also maintained through time tickets, although such work is not directly traceable to a specific job. The difference between direct labor and indirect labor is that the indirect labor records the debit to manufacturing overhead while the credit is to factory wages payable.

Dinosaur Vinyl's time tickets indicate that $4,000 in indirect labor costs were incurred during the period. The entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Manufacturing Overhead	4,000	
	Factory wages payable		4,000
	To record indirect labor for WIP inventories		

Figure 8.53 *By: Rice University Openstax CC BY NC SA 4.0*

Dinosaur Vinyl also records the actual overhead incurred. As shown in Figure 8.55, manufacturing overhead costs of $21,000 were incurred. The entry to record these expenses increases the amount of overhead in the manufacturing overhead account. The entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Manufacturing Overhead	21,000	
	Supplies Inventory		1,500
	Utilities Payable		7,000
	Accumulated Depreciation		7,500
	Prepaid Insurance		2,917
	Interest Payable		2,083
	To record April's overhead expenses		

Figure 8.54 *By: Rice University Openstax CC BY NC SA 4.0*

The amount of overhead applied to Job MAC001 is $165. The process of determining the manufacturing overhead calculation rate was explained and demonstrated in 8.3 Three Major Components of Product Costs in Job Order. The journal entry to record the manufacturing overhead for Job MAC001 is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Work in Process Inventory	165	
	Manufacturing Overhead		165
	To apply overhead to Job MAC001		

Figure 8.55 *By: Rice University Openstax CC BY NC SA 4.0*

Journal Entry to Move Work in Process Costs into Finished Goods

When each job and job order cost sheet have been completed, an entry is made to transfer the total cost from the work in process inventory to the finished goods inventory. The total cost of the product for Job MAC001 is $931 and the entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Finished Goods Inventory	931	
	Work in Process Inventory		931
	To recognize completion of Job MAC001		

Figure 8.56 *By: Rice University Openstax CC BY NC SA 4.0*

Journal Entries to Move Finished Goods into Cost of Goods Sold

When the sale has occurred, the goods are transferred to the buyer. The product is transferred from the finished goods inventory to cost of goods sold. A corresponding entry is also made to record the sale. The sign for Job MAC001 had a sales price of $2,000 and a cost of $931. These are the entries to record the transfer of goods and sale to the buyer:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cost of Goods Sold	931	
	Finished Goods Inventory		931
	To recognize sale of Job MAC001		
	Accounts Receivable	2,000	
	Sales		2,000
	To recognize sale of Job MAC001		

Figure 8.57 *By: Rice University Openstax CC BY NC SA 4.0*

The resulting accounting is shown on the company's income statement:

DINOSAUR VINYL, INC. Income Statement	
Sales	$2,000
Cost of Goods Sold	931
Gross profit	$1,069

Figure 8.58 *By: Rice University Openstax CC BY NC SA*

Long Description

A journal entry lists Work in Process Inventory with a debit of 700, Raw Materials Inventory: Vinyl with a credit of 300, Raw Materials Inventory: Black ink with a credit of 100, Raw Materials Inventory: Red ink with a credit of 60, Raw Materials Inventory: Gold ink with a credit of 60, Raw Materials Inventory: Grommets with a credit of 120, Raw Materials Inventory: Finishing wood with a credit of 60, and the note “To record requisition of vinyl and ink inventory”. Return

8.8 Job Order in the Service Industries

Fundamentals of the Job Order Costing Method for Service Entities

Instead of being dependent on materials, service industries depend on labor. Since their work is labor intensive, it makes sense to use labor as an activity base with billable hours often as the best allocation base. For example, in an audit, there often will be several accountants, with differing levels of experience and expertise involved in the assignment. The accounting firms have more billable hours at the staff level and fewer billable hours at the partner level. And since the firm bills the partner's time at a significantly higher rate than the staff, it makes sense to apply overhead at the billable hours instead of the billable costs.

In service industries, there is no manufacturing overhead because they are not manufacturing a product, but instead are providing a service. Accordingly, overhead is called operating overhead.

Another terminology difference is the inventory accounts. The jobs are considered movies or assignments in process, and are transferred to a cost of service sold account instead of to a finished goods inventory.

CONCEPTS IN PRACTICE

Tracking Costs in Healthcare

Healthcare is one of the industries that keeps track of materials, such as medicine. In this industry, direct labor is shown to the patient as the cost of the provider, such as a physician, physician assistant, or nurse practitioner. Indirect labor includes all other personnel from front desk staff to the nurse who gathers vital signs or a technician who performs tests. Patients do not see the overhead cost on their bill, but it is built into the invoice as part of the practitioner or testing fees.

Service Entity Use of a Job Order Costing System

To understand how a service provider uses a job order cost system, let's consider the case of IFixIT. IFixIT Systems is a **Sony**-authorized repair provider that fixes audiovisual equipment brought in by customers. IFixIT requires customers to pay $50 to diagnose the problem. IFixIt pays its employees $25 per hour and assigns overhead equal to its direct labor cost. The customers' bills do not show overhead and are instead itemized as parts plus labor, where the cost for parts is the original cost plus a markup, and the labor rate is $80 per hour.

A customer brought in his TV and paid the $50 diagnostic fee. IFixIT determined a new power cord was needed. To fix it, IFixIT purchases the part from its suppliers at $42 and pays $75 in direct labor for 3 hours at $25 per hour. Overhead is applied equal to the direct labor cost of $75. The customer is charged

$310, consisting of $70 for the part and 3 hours of labor at a rate of $80 per hour. IFixIT records the journal entries shown:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
	Cash	50	
	Diagnosis revenue		50
	Diagnosis of Sony Bravia for Job 4740325		
	Repair in process	42	
	Accounts Payable		42
	Purchase of new power cord for Job 4740325		
	Repair in process	75	
	Salaries Payable		75
	Assigning labor to Job 4740325		
	Repair in process	75	
	Operating overhead		75
	Assigning overhead costs to Job 4740325		
	Cost of completed repair	192	
	Repair in Process		192
	Completion of Job 4740325		
	Cash	310	
	Repair revenue		310
	Completion of Job 4740325		

Figure 8.59 *By: Rice University Openstax CC BY NC SA Long Description*

Long Description

A journal with four columns headed “Date”, “Account”, “Debit”, and “Credit.” There are six entries (not dated.) The first one shows in the “Account” column a debit to “Cash, a credit (indented) to Diagnosis revenue, and the entry description, which reads “Diagnosis of Sony Bravia for Job 4740325”. The amount of 50 is listed in the debit column across from the “Cash” debit and in the credit column across from the “Diagnosis Revenue” credit. The second entry shows in the “Account” column a debit to “Repair in process”, a credit (indented) to “Accounts Payable”, and the entry description, which reads “Purchase of new power cord for Job 4740325.” The amount of 42 is shown across from each of these in the

respective debit and credit columns. The third entry shows in the “Account” column a debit to “Repair in process”, a credit (indented) to “Salaries Expense”, and the entry description, which reads “Assigning labor to Job 4740325.” The amount of 75 is shown across from each of these in the respective debit and credit columns. The fourth entry shows in the “Account” column a debit to “Repair in process”, a credit (indented) to “Operating Overhead”, and the entry description, which reads “Assigning overhead costs to Job 4740325.” The amount of 75 is shown across from each of these in the respective debit and credit columns. The fifth entry shows in the “Account” column a debit to “Cost of completed repair”, a credit (indented) to “Repair in process”, and the entry description, which reads “Completion of Job 4740325.” The amount of 192 is shown across from each of these in the respective debit and credit columns. The sixth entry shows in the “Account” column a debit to “Cash” , a credit (indented) to “Repair Service”, and the entry description, which reads “Completion of Job 4740325.” The amount of 310 is shown across from each of these in the respective debit and credit columns. Return

Process Costing

8.9 Process Costing Overview

Process costing is the optimal costing system when a standardized process is used to manufacture identical products and the direct material, direct labor, and manufacturing overhead cannot be easily or economically traced to a specific unit. Process costing is used most often when manufacturing a product in batches. Each department or production process or batch process tracks its direct material and direct labor costs as well as the number of units in production. The actual cost to produce each unit through a process costing system varies, but the average result is an adequate determination of the cost for each manufactured unit. Examples of items produced and accounted for using a form of the process costing method could be soft drinks, petroleum products, or even furniture such as chairs, assuming that the company makes batches of the same chair, instead of customizing final products for individual customers.

For example, small companies, such as David and William's, and large companies, such as **Nabisco**, use similar cost-determination processes. In order to understand how much each product costs—for example, Oreo cookies—**Nabisco** uses process costing to track the direct materials, direct labor, and manufacturing overhead used in the manufacturing of its products. Oreo production has six distinct steps or departments: (1) make the cookie dough, (2) press the cookie dough into a molding machine, (3) bake the cookies, (4) make the filling and apply it to the cookies, (5) put the cookies together into a sandwich, and (6) and place the cookies into plastic trays and packages. Each department keeps track of its direct materials used and direct labor incurred, and

manufacturing overhead applied to facilitate determining the cost of a batch of Oreo cookies.



Figure 8.60 *By: Rice University Openstax CC BY NC SA*

As previously mentioned, process costing is used when similar items are produced in large quantities. As such, many individuals immediately associate process costing with assembly line production. Process costing works best when products cannot be distinguished from each other and, in addition to obvious production line products like ice cream or paint, also works for more complex manufacturing of similar products like small engines. Conversely, products in a job order cost system are manufactured in small quantities and include custom jobs such as custom manufacturing products. They can also be legal or accounting tasks, movie production, or major projects such as construction activities.

The difference between process costing and job order costing relates to how the costs are assigned to the products. In either costing system, the ability to obtain and analyze cost data is needed. This results in the costing system selected being the one that best matches the manufacturing process.

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=1388#oembed-1

A job order cost system is often more expensive to maintain than a basic process costing system, since there is a cost

associated with assigning the individual material and labor to the product. Thus, a job order cost system is used for custom jobs when it is easy to determine the cost of materials and labor used for each job. A process cost system is often less expensive to maintain and works best when items are identical and it is difficult to trace the exact cost of materials and labor to the final product. For example, assume that your company uses three production processes to make jigsaw puzzles. The first process glues the picture on the cardboard backing, the second process cuts the puzzle into pieces, and the final process loads the pieces into the boxes and seals them. Tracing the complete costs for the batch of similar puzzles would likely entail three steps, with three separate costing system components. In this environment, it would be difficult and not economically feasible to trace the exact materials and the exact labor to each individual puzzle; rather, it would be more efficient to trace the costs per batch of puzzles.

The costing system used typically depends on whether the company can most efficiently and economically trace the costs to the job (favoring job order costing system) or to the production department or batch (favoring a process costing system).

While the costing systems are different from each other, management uses the information provided to make similar managerial decisions, such as setting the sales price. For example, in a job order cost system, each job is unique, which allows management to establish individual prices for individual projects. Management also needs to establish a sales price for a product produced with a process costing system, but this system is not designed to stop the production process and individually cost each batch of a product, so management must set a price that will work for many batches of the product.

In addition to setting the sales price, managers need to know the cost of their products in order to determine the value of inventory, plan production, determine labor needs, and make

long- and short-term plans. They also need to know the costs to determine when a new product should be added or an old product removed from production.

In this chapter, you will learn when and why process costing is used. You'll also learn the concepts of conversion costs and equivalent units of production and how to use these for calculating the unit and total cost of items produced using a process costing system.

Basic Managerial Accounting Terms Used in Job Order Costing and Process Costing

Regardless of the costing system used, manufacturing costs consist of direct material, direct labor, and manufacturing overhead. Figure 8.61 shows a partial organizational chart for Rock City Percussion, a drumstick manufacturer. In this example, two groups—administrative and manufacturing—report directly to the chief financial officer (CFO). Each group has a vice president responsible for several departments. The organizational chart also shows the departments that report to the production department, illustrating the production arrangement. The material storage unit stores the types of wood used (hickory, maple, and birch), the tips (nylon and felt), and packaging materials.

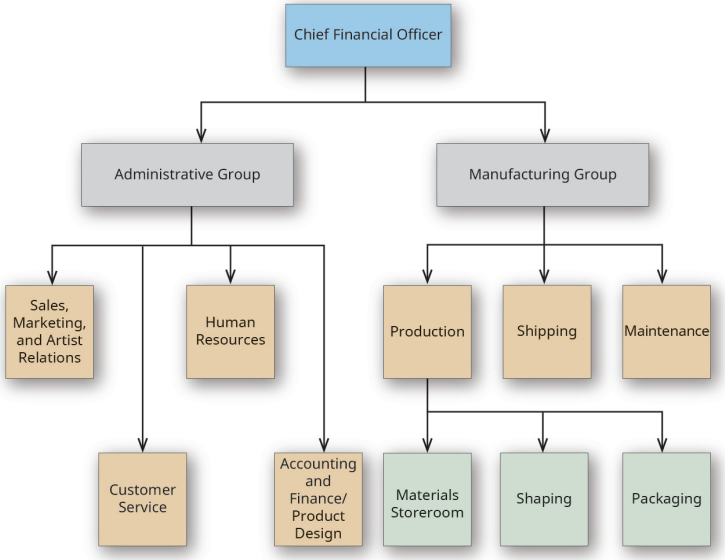


Figure 8.61 The Organizational Chart for Rock City Percussion *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Understanding the company's organization is an important first step in any costing system. Next is understanding the production process. The most basic drumstick is made of hickory and has a wooden tip. When the popular size 5A stick is manufactured, the hickory stored in the materials storeroom is delivered to the shaping department where the wood is cut into pieces, shaped into dowels, and shaped into the size 5A shape while under a stream of water. The sticks are dried, and then sent to the packaging department, where the sticks are embossed with the Rock City Percussion logo, inspected, paired, packaged, and shipped to retail outlets such as **Guitar Center**. The manufacturing process is described in Figure 8.62.

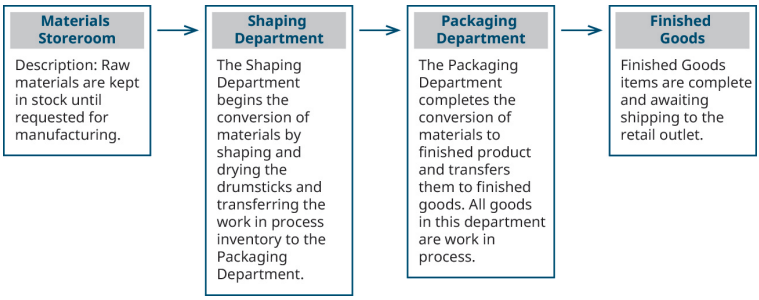


Figure 8.62 Rock City Percussion Manufacturing Process *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

The different units within Rock City Percussion illustrate the two main cost categories of a manufacturing company: manufacturing costs and administrative costs.

Manufacturing Costs

Manufacturing costs or product costs include all expenses required to manufacture the product: direct materials, direct labor, and manufacturing overhead. Since process costing assigns the costs to each department, the inventory at the end of the period includes the finished goods inventory, and the work in process inventory for each manufacturing department. For example, using the departments shown in Figure 8.62, raw materials inventory is the cost paid for the materials that remain in the storeroom until requested.

While still in production, the work in process units are moved from one department to the next until they are completed, so the work in process inventory includes all of the units in the shaping and packaging departments. When the units are completed, they are transferred to finished goods inventory and become costs of goods sold when the product is sold.

When assigning costs to departments, it is important to separate the product costs from the period costs, which are those that are typically related with a particular time period, instead of attached to the production of an asset. Management often needs additional information to make decisions and needs the product costs further categorized as prime costs or conversion costs (Figure 8.63). Prime costs are costs that include the primary (or direct) product costs: direct material and direct labor. Conversion costs are the costs necessary to convert direct materials into a finished product: direct labor and manufacturing overhead, which includes other costs that are not classified as direct materials or direct labor, such as plant insurance, utilities, or property taxes. Also, note that direct labor is considered to be a component of both prime costs and conversion costs.

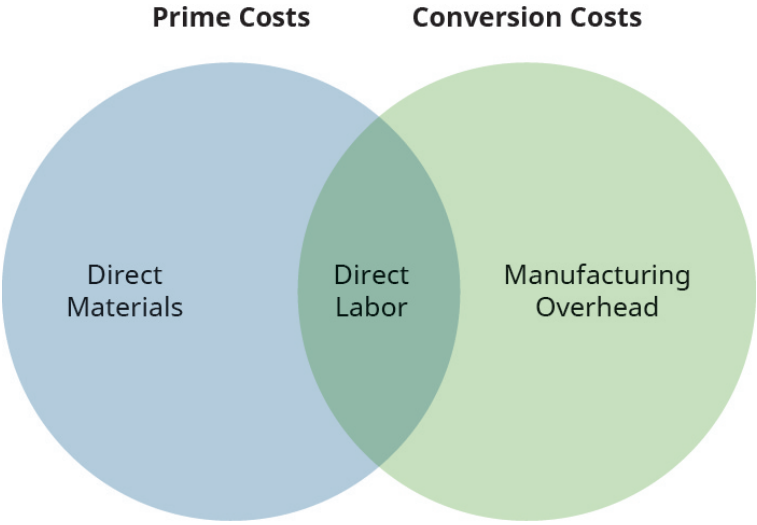


Figure 8.63 Prime Costs and Conversion Costs. *Product costs can be categorized as prime costs (direct product costs) or conversion costs (costs incurred while converting the materials into a finished product). Direct labor is accounted for in both categories. By: Rice University OpenStax CC BY-NC-SA 4.0*

Job order costing tracks prime costs to assign direct material and direct labor to individual products (jobs). Process costing also tracks prime costs to assign direct material and direct labor to each production department (batch). Manufacturing overhead is another cost of production, and it is applied to products (job order) or departments (process) based on an appropriate activity base.

Selling and Administrative Expenses

Selling and administrative (S&A) expenses are period costs, which means that they are recorded in the period in which they were incurred. Selling and administrative expenses typically are not directly assigned to the items produced or services provided and include costs of departments not directly associated with manufacturing but necessary to operate the business. The selling costs component of S&A expenses is related to the promotion and sale of the company's products, while administrative expenses are related to the administration of the company. Some examples of S&A expenses include marketing costs; administration building rent; the chief executive officer's salary expense; and the accounting, payroll, and data processing department expenses.

These general rules for S&A expenses, however, have their exceptions. For example, some items that are classified as overhead, such as plant insurance, are period costs but are classified as overhead and are attached to the items produced as product costs.

The expense recognition principle is the primary reason to separate the costs of production from the other expenses of the company. This principle requires costs to be recorded in the period in which they are incurred. The costs are expensed when matched to the revenue with which they are associated;

this is commonly referred to as *having the expenses follow the revenues*.

Period costs are expensed during the period in which they are incurred; this allows a company to apply the administrative and other expenses shown on the income statement to the same period in which the company earns income. Under generally accepted accounting principles (GAAP), separating the production costs and assigning them to the department results in the costs of the product staying with the work in process inventory for each department. This follows the expense recognition principle because the cost of the product is expensed when revenue from the sale is recognized.

Equivalent Units

In a process cost system, costs are maintained by each department, and the method for determining the cost per individual unit is different than in a job order costing system. Rock City Percussion uses a process cost system because the drumsticks are produced in batches, and it is not economically feasible to trace the direct labor or direct material, like hickory, to a specific drumstick. Therefore, the costs are maintained by each department, rather than by job, as they are in job order costing.

How does an organization determine the cost of each unit in a process costing environment? The costs in each department are allocated to the number of units produced in a given period. This requires determination of the number of units produced, but this is not always an easy process. At the end of the accounting period, there typically are always units still in production, and these units are only partially complete. Think of it this way: At midnight on the last day of the month, all accounting numbers need to be determined in order to process the financial statements for that month, but the

production process does not stop at the end of each accounting period. However, the number of units produced must be calculated at the end of the accounting period to determine the number of equivalent units, or the number of units that would have been produced if the units were produced sequentially and in their entirety in a particular time period. The number of equivalent units is different from the number of actual units and represents the number of full or whole units that could have been produced given the amount of effort applied. To illustrate, consider this analogy. You have five large pizzas that each contained eight slices. Your friends served themselves, and when they were finished eating, there were several partial pizzas left. In equivalent units, determine how many whole pizzas are left if the remaining slices are divided as shown in Figure 8.64

- Pie 1 had one slice
- Pie 2 had two slices
- Pie 3 had two slices
- Pie 4 had three slices
- Pie 5 had eight slices

Together, there are sixteen slices left. Since there are eight slices per pizza, the leftover pizza would be considered two full equivalent units of pizzas. The equivalent unit is determined separately for direct materials and for conversion costs as part of the computation of the per-unit cost for both material and conversion costs.

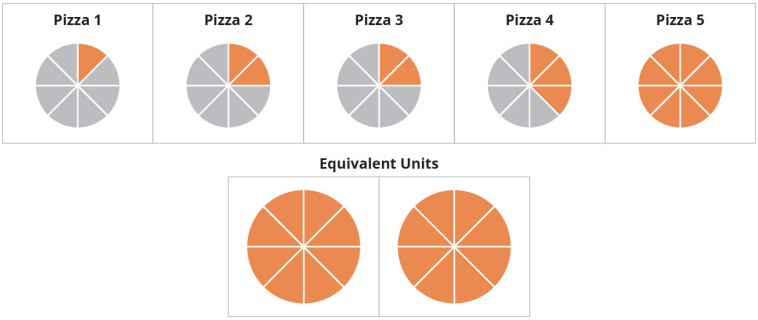


Figure 8.64 Equivalent Units *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Major Characteristics of Process Costing

Process costing is the optimal system for a company to use when the production process results in many similar units. It is used when production is continuous or occurs in large batches and it is difficult to trace a particular input cost to a specific individual product.

For example, before David and William found ways to make five large cookies per batch, their family always made one large cookie per batch. In order to make five cookies at a time, they had to gather the ingredients and baking materials, including five bowls and five cookie sheets. The exact amount of ingredients for one large cookie was mixed in each separate bowl and then placed on the cookie sheet. When this method was used, it was easy to establish that exactly one egg, two cups of flour, three-quarter cup of chocolate chips, three-quarter cup of sugar, one-quarter teaspoon salt, and so forth, were in each cookie. This made it easy to determine the exact cost of each cookie. But if David and William used one bowl instead of five bowls, measured the ingredients into it and then divided the dough into five large cookies, they could not

know for certain that each cookie has exactly two cups of flour. One cookie may have 1 and 7 eighths cups and another may have 1 and 15 sixteenths cups, and one cookie may have a few more chocolate chips than another. It is also impossible to trace the chocolate chips from each bag to each cookie because the chips were mixed together. These variations do not affect the taste and are not important in this type of accounting. Process costing is optimal when the products are relatively homogenous or indistinguishable from one another, such as bottles of vegetable oil or boxes of cereal.

Often, process costing makes sense if the individual costs or values of each unit are not significant. For example, it would not be cost effective for a restaurant to make each cup of iced tea separately or to track the direct material and direct labor used to make each eight-ounce glass of iced tea served to a customer. In this scenario, job order costing is a less efficient accounting method because it costs more to track the costs per eight ounces of iced tea than the cost of a batch of tea. Overall, when it is difficult or not economically feasible to track the costs of a product individually, process costing is typically the best cost system to use.

Process costing can also accommodate increasingly complex business scenarios. While making drumsticks may sound simple, an immense amount of technology is involved. Rock City Percussion makes 8,000 hickory sticks per day, four days each week. The sticks made of maple and birch are manufactured on the fifth day of the week. It is difficult to tell the first drumstick made on Monday from the 32,000th one made on Thursday, so a computer matches the sticks in pairs based on the tone produced.

Process costing measures and assigns the costs to the associated department. The basic 5A hickory stick consists only of hickory as direct material. The rest of the manufacturing process involves direct labor and manufacturing overhead, so the focus is on properly assigning those costs. Thus, process

costing works well for simple production processes such as cereal, rubber, and steel, and for more complicated production processes such as the manufacturing of electronics and watches, if there is a degree of similarity in the production process.

In a process cost system, each department accumulates its costs to compute the value of work in process inventory, so there will be a work in process inventory for each manufacturing or production department as well as an inventory cost for finished goods inventory. Manufacturing departments are often organized by the various stages of the production process. For example, blending, baking, and packaging could each be categorized as manufacturing or production departments for the cookie producer, while cutting, assembly, and finishing could be manufacturing or production departments with accompanying costs for a furniture manufacturer. Each department, or process, will have its own work in process inventory account, but there will only be one finished goods inventory account.

There are two methods used to compute the values in the work in process and finished goods inventories. The first method is the weighted-average method, which includes all costs (costs incurred during the current period and costs incurred during the prior period and carried over to the current period). This method is often favored, because in the process cost production method there often is little product left at the end of the period and most has been transferred out. The second method is the first-in, first-out (FIFO) method, which calculates the unit costs based on the assumption that the first units sold come from the prior period's work in process that was carried over into the current period and completed. After these units are sold, the newer completed units can then be sold. The theory is similar to the FIFO inventory valuation process that you learned about in Accounting for Inventory. (Since the FIFO process costing method is more complicated

than the weighted-average method, the FIFO method is typically covered in more advanced accounting courses.)

With processing, it is difficult to establish how much of each material, and exactly how much time is in each unit of finished product. This will require the use of the equivalent unit computation, and management selects the method (weighted average or FIFO) that best fits their information system.

Process costing can also be used by service organizations that provide homogeneous services and often do not have inventory to value, such as a hotel reservation system. Although they have no inventory, the hotel might want to know its costs per reservation for a period. They could allocate the total costs incurred by the reservation system based on the number of inquiries they served. For example, assume that in a year they incurred costs of $200,000 and served 50,000 potential guests. They could determine an average cost by dividing costs by number of inquiries, or $200,000 ÷ 50,000 = $4.00 per potential guest.

In the case of a not-for-profit company, the same process could be used to determine the average costs incurred by a department that performs interviews. The department's costs would be allocated based on the number of cases processed. For example, assume a not-for-profit pet adoption organization has an annual budget of $180,000 and typically matches 900 shelter animals with new owners each year. The average cost would be $200 per match.

Similarities between Process Costing and Job Order Costing

Both process costing and job order costing maintain the costs of direct material, direct labor, and manufacturing overhead. The process of production does not change because of the

costing method. The costing method is chosen based on the production process.

In job order cost production, the costs can be directly traced to the job, and the job cost sheet contains the total expenses for that job. Process costing is optimal when the costs cannot be traced directly to the job. For example, it would be impossible for David and William to trace the exact amount of eggs in each chocolate chip cookie. It is also impossible to trace the exact amount of hickory in a drumstick. Even two sticks made sequentially may have different weights because the wood varies in density. These types of manufacturing are optimal for the process cost system.

The similarities between job order cost systems and process cost systems are the product costs of materials, labor, and overhead, which are used determine the cost per unit, and the inventory values. The differences between the two systems are shown in Table 8.3.

Table 8.3 Differences between Job Order Costing and Process Costing By: Rice University OpenStax CC BY-NC-SA 4.0

Job Order Costing	Process Costing
Product costs are traced to the product and recorded on each job's individual job cost sheet.	Product costs are traced to departments or processes.
Each department tracks its expenses and adds them to the job cost sheet. As jobs move from one department to another, the job cost sheet moves to the next department as well.	Each department tracks its expenses, the number of units started or transferred in, and the number of units transferred to the next department.
Unit costs are computed using the job cost sheet.	Unit costs are computed using the departmental costs and the equivalent units produced.
Finished goods inventory includes the products completed but not sold, and all incomplete jobs are work in process inventory.	Finished goods inventory is the number of units completed at the per unit cost. Work in process inventory is the cost per unit and the equivalent units remaining to be completed.

CONCEPTS IN PRACTICE

Choosing Between Process Costing and Job Order Costing

Process costing and job order costing are both acceptable methods for tracking costs and production levels. Some companies use a single method, while some companies use both, which creates a hybrid costing system. The system a company uses depends on the nature of the product the company manufactures.

Companies that mass produce a product allocate the costs to each department and use process costing. For example, **General Mills** uses process costing for its cereal, pasta, baking products, and pet foods. Job order systems are custom orders because the cost of the direct material and direct labor are traced directly to the job being produced. For example, **Boeing** uses job order costing to manufacture planes.

When a company mass produces parts but allows customization on the final product, both systems are used; this is common in auto manufacturing. Each part of the vehicle is mass produced, and its cost is calculated with process costing. However, specific cars have custom options, so each individual car costs the sum of the specific parts used.

Long Descriptions

Box labeled Chief Financial Officer at the top points to two boxes just below labeled Administrative Group and

Manufacturing Group. The Administrative Group box points to four boxes below that: Sales, Marketing, and Artist Relations; Customer Service; Human Resources; and Accounting and Finance/Product Design. The Manufacturing Group box points to three boxes below it: Production, Shipping, and Maintenance. The Production box points to three boxes below it: Materials Storeroom, Shaping, and Packaging. Return

Four boxes with arrows pointing from left to right. Leftmost box is Materials Storeroom. Description: Raw materials are kept in stock until requested for manufacturing. The next box is Shaping and Drying. The Shaping Department begins the conversion of materials by shaping the drumsticks and transferring the work in process inventory to the Packaging Department. The next box is the Packaging Department. The Packaging Department completes the conversion of materials to finished product and transfers them to finished goods. All goods in this department are work in process. The last box is Finished Goods. Finished Goods items are complete and awaiting shipping to the retail outlet. Return

A diagram showing five boxes with pizzas labeled 1 through 5. The first has seven grayed-out slices and one orange slice. The second and third have six grayed-out and two orange slices each. The fourth has five grayed-out and three orange, the fifth has eight orange slices. There are two more boxes filled with the orange slices, labeled Equivalent Units—one has the collection of the eight oranges slices collected from boxes 1 through 4, the other is the full box 5 repeated. Return

8.10 Conversion Costs

In a processing environment, there are two concepts important to determining the cost of products produced. These are the concepts of equivalent units and conversion costs. As you have learned, equivalent units are the number of units that would have been produced if one unit was completed before starting a second unit. For example, four units that are one-fourth finished would equal one equivalent unit. Conversion costs are the labor and overhead expenses that "convert" raw materials into a completed unit. Each department tracks its conversion costs in order to determine the quantity and cost per unit (see TBD; we discuss this concept in more detail later). Management often uses the cost information generated to set the sales price; to set standard usage data and price for material, labor, and overhead; and to allow management to evaluate the efficiency of production and plan for the future.

Definition of Conversion Costs

Conversion costs are the total of direct labor and factory overhead costs. They are combined because it is the labor and overhead together that convert the raw material into the finished product. Remember that factory, manufacturing, or organizational overhead (you might see all three terms in practice) is composed of three sources: indirect materials, indirect labor, and all other overhead costs that are not indirect materials or indirect labor. Materials are often added in stages at discrete points of production, such as at the beginning, middle, or end of a process, but conversion is usually applied equally throughout the process. For example, in the opening example, David and William do not add direct material

(ingredients) evenly throughout the cookie-making process. They are all added at the beginning of the production process, so they begin with the direct materials but add labor and overhead throughout the rest of the process.

Conversion costs can be explained through the process of making **Just Born**'s Peeps. **Just Born** makes 5.5 million Peeps per day using three ingredients and the following process:[3]

1. Use machines to add and mix the sugar, corn syrup, and gelatin into a mixture called a slurry. Send slurry through a whipper to give the marshmallow its fluffy texture.
2. Color the sugar.
3. Deposit marshmallows on sugar-coated belts in the Peep shape. Send Peeps on belts through a wind tunnel that stirs up the sugar to coat the entire shape.
4. Add eyes, and inspect.
5. Move the Peeps via belt into their appropriate tray, and wrap with cellophane.

In the Peep-making process, the direct materials of sugar, corn syrup, gelatin, color, and packaging materials are added at the beginning of steps 1, 2, and 5. While the fully automated production does not need direct labor, it does need indirect labor in each step to ensure the machines are operating properly and to perform inspections (step 4).

Mechanics of Applying Conversion Costs

Let's return to our drumstick example to learn how to work with conversion costs. Rock City Percussion has two departments critical to manufacturing drumsticks: the shaping and packaging departments.

The shaping department uses only wood as its direct material and water as its indirect material. In the shaping

department, the material is added first. Then, machines cut the wood underwater into dowels, separate them, and move them to machines that shape the dowels into drumsticks. These machines need electricity to operate and personnel to monitor and adjust the processes and to maintain the equipment. When the shaping is finished, a conveyer belt transfers the sticks to the finishing department.

Since the drumsticks are made by performing one process on one batch at a time, instead of producing one stick at a time from start to finish, it is difficult to determine the exact materials, labor, and overhead for a single pair of drumsticks. It is easier to track the materials and conversion costs for one batch and have those costs follow the batch to the next process.

Therefore, once the batch of sticks gets to the second process—the packaging department—it already has costs attached to it. In other words, the packaging department receives both the drumsticks and their related costs from the shaping department. For the basic size 5A stick, the packaging department adds material at the beginning of the process. The 5A uses only packaging sleeves as its direct material, while other types may also include nylon, felt, and/or the ingredients for the proprietary handgrip. Direct labor and manufacturing overhead are used to test, weigh, and sound-match the drumsticks into pairs.

Thus, at the end of the accounting period, there are two work in process inventories: one in the shaping department and one in the packaging department.

Direct materials are added at the beginning of shaping and packaging departments, so the work in process inventory for those departments is 100% complete with regard to materials, but it is not complete with regard to conversion costs. If they were 100% complete with regard to conversion costs, then they would have been transferred to the next department.

Footnotes

- 3 Just Born. “Marshmallow Peeps Factory Tour.” n.d. http://www.justborn.com/resource/corporate/popups/virtualTour.cfm

8.11 Equivalent Units - initial period

As described previously, process costing can have more than one work in process account. Determining the value of the work in process inventory accounts is challenging because each product is at varying stages of completion and the computation needs to be done for each department. Trying to determine the value of those partial stages of completion requires application of the equivalent unit computation. The equivalent unit computation determines the number of units if each is manufactured in its entirety before manufacturing the next unit. For example, forty units that are 25% complete would be ten (40 × 25%) units that are totally complete.

Direct material is added in stages, such as the beginning, middle, or end of the process, while conversion costs are expensed evenly over the process. Often there is a different percentage of completion for materials than there is for labor. For example, if material is added at the beginning of the process, the forty units that are 100% complete with respect to material and 25% complete with respect to conversion costs would be the same as forty units of material and ten units (40 × 25%) completed with conversion costs.

For example, during the month of July, Rock City Percussion purchased raw material inventory of $25,000 for the shaping department. Although each department tracks the direct material it uses in its own department, all material is held in the material storeroom. The inventory will be requisitioned for each department as needed.

During the month, Rock City Percussion's shaping department requested $10,179 in direct material and started into production 8,700 hickory drumsticks of size 5A. There was

no beginning inventory in the shaping department, and 7,500 drumsticks were completed in that department and transferred to the finishing department. Wood is the only direct material in the shaping department, and it is added at the beginning of the process, so the work in process (WIP) is considered to be 100% complete with respect to direct materials. At the end of the month, the drumsticks still in the shaping department were estimated to be 35% complete with respect to conversion costs. All materials are added at the beginning of the shaping process. While beginning the size 5A drumsticks, the shaping department incurred these costs in July:

Direct materials	$10,179
Direct labor	15,176
Applied overhead	7,000
Total cost	$32,355

Figure 8.65 *By: Rice University Openstax CC BY NC SA*

These costs are then used to calculate the equivalent units and total production costs in a four-step process.

Step One: Determining the Units to Which Costs Will Be Assigned

In addition to the equivalent units, it is necessary to track the units completed as well as the units remaining in ending inventory. A similar process is used to account for the costs completed and transferred. Reconciling the number of units

and the costs is part of the process costing system. The reconciliation involves the total of beginning inventory and units started into production. This total is called "units to account for," while the total of beginning inventory costs and costs added to production is called "costs to be accounted for." Knowing the total units or costs to account for is helpful since it also equals the units or costs transferred out plus the amount remaining in ending inventory.

When the new batch of hickory sticks was started on July 1, Rock City Percussion did not have any beginning inventory and started 8,700 units, so the total number of units to account for in the reconciliation is 8,700:

Units to Account For	Units
Beginning work in process	0
Units started into production	8,700
Total units to account for	8,700

Figure 8.66 *By: Rice University Openstax CC BY NC SA*

The shaping department completed 7,500 units and transferred them to the testing and sorting department. No units were lost to spoilage, which consists of any units that are not fit for sale due to breakage or other imperfections. Since the maximum number of units that could possibly be completed is 8,700, the number of units in the shaping department's ending inventory must be 1,200. The total of the 7,500 units completed and transferred out and the 1,200 units in ending inventory equal the 8,700 possible units in the shaping department.

Units Accounted For	Units
Completed and transferred out	7,500
Ending work in process	1,200
Total units to account for	8,700

Figure 8.67 *By: Rice University Openstax CC BY NC SA*

Step Two: Computing the Equivalent Units of Production

All of the materials have been added to the shaping department, but all of the conversion elements have not; the numbers of equivalent units for material costs and for conversion costs remaining in ending inventory are different. All of the units transferred to the next department must be 100% complete with regard to that department's cost or they would not be transferred. So the number of units transferred is the same for material units and for conversion units. The process cost system must calculate the equivalent units of production for units completed (with respect to materials and conversion) and for ending work in process with respect to materials and conversion.

For the shaping department, the materials are 100% complete with regard to materials costs and 35% complete with regard to conversion costs. The 7,500 units completed and transferred out to the finishing department must be 100% complete with regard to materials and conversion, so they make up 7,500 (7,500 × 100%) units. The 1,200 ending work in process units are 100% complete with regard to material and have 1,200 (1,200 × 100%) equivalent units for material. The 1,200 ending work in process units are only 35% complete with

regard to conversion costs and represent 420 (1,200 × 35%) equivalent units.

Work in Process Completion %		100%	35%
Units accounted for	Total Units	Material Units	Conversion Units
Completed and transferred out	7,500	7,500	7,500
Ending work in process	1,200	1,200	420
Total equivalent units for shaping	8,700	8,700	7,920

Figure 8.68 *By: Rice University Openstax CC BY NC SA*

Step Three: Determining the Cost per Equivalent Unit

Once the equivalent units for materials and conversion are known, the cost per equivalent unit is computed in a similar manner as the units accounted for. The costs for material and conversion need to reconcile with the total beginning inventory and the costs incurred for the department during that month.

Costs to Account For	Materials	Conversion	Total
Beginning work in process	$ 0	$ 0	$ 0
Incurred during the period	$10,179	$22,176	$32,355
Total costs to account for	$10,179	$22,176	$32,355
Equivalent units	8,700	7,920	
Cost per equivalent unit	$ 1.17	$ 2.80	$ 3.97

Figure 8.69 *By: Rice University Openstax CC BY NC SA*

The total materials costs for the period (including any beginning inventory costs) is computed and divided by the equivalent units for materials. The same process is then completed for the total conversion costs. The total of the cost per unit for material ($1.17) and for conversion costs ($2.80) is

the total cost of each unit transferred to the finishing department ($3.97).

Step Four: Allocating the Costs to the Units Transferred Out and Partially Completed in the Shaping Department

Now you can determine the cost of the units transferred out and the cost of the units still in process in the shaping department. To calculate the goods transferred out, simply take the units transferred out times the sum of the two equivalent unit costs (materials and conversion) because all items transferred to the next department are complete with respect to materials and conversion, so each unit brings all its costs. But the ending WIP value is determined by taking the product of the work in process material units and the cost per equivalent unit for materials plus the product of the work in process conversion units and the cost per equivalent unit for conversion.

Transferred out costs	(7,500 units × $1.17) + (7,500 units × $2.80) = $29,775
Ending work in process: materials	(1,200 × $1.17) = $1,404
Ending work in process: conversion	(420 × $2.80) = $1,176
Ending work in process: total	$1,404 + $1,176 = $2,580

Figure 8.70 *By: Rice University Openstax CC BY NC SA*

This information is accumulated in a production cost report. This report shows the costs used in the preparation of a product, including the cost per unit for materials and conversion costs, and the amount of work in process and finished goods inventory. A complete production cost report for the shaping department is illustrated in Figure 8.71.

Units to account for	Units		
Beginning work in process	—		
Units started into production	8,700		
Total units to account for	8,700		
Work in process completion %	100%	35%	
Units accounted for	**Materials Units**	**Conversion Units**	**Total**
Completed and transferred out	7,500	7,500	7,500
Ending work in process	1,200	420	1,200
Total units to account for	8,700	7,920	8,700
Costs to account for	**Materials**	**Conversion**	**Total**
Beginning work in process	$ 0	$ 0	$ 0
Incurred during the period	$10,179	$22,176	$32,355
Total costs to account for	$10,179	$22,176	$32,355
Equivalent units	8,700	7,920	
Cost per equivalent unit	$ 1.17	$ 2.80	$ 3.97
	Materials	**Conversion**	**Total**
Value of ending work in process	$ 1,404	$ 1,176	$ 2,580
Completed and transferred	8,775	21,000	29,775
Total costs	$10,179	$22,176	$32,355

Figure 8.71 Production Cost Report for the Shaping Department. *By: Rice University Openstax CC BY NC SA Long Description*

YOUR TURN

Calculating Inventory Transferred and Work in Process Costs

Kyler Industries started a new batch of paint on October 1. The new batch consists of 8,700 cans of paint, of which 7,500 was completed and transferred to finished goods. During October, the manufacturing process recorded the following expenses: direct materials of $10,353; direct labor of $17,970; and applied overhead of $9,000. The inventory still in process is 100% complete with respect to materials and 30% complete with respect to conversion. What is the cost of inventory transferred

out and work in process? Assume that there is no beginning work in process inventory.

Solution

Units to account for	Units		
Beginning work in process	0		
Units started into production	8,700		
Total units to be account for	8,700		
	Materials	**Conversion**	**Total**
Work in process completion %	100%	30%	
Units accounted for			
Completed and transferred out	7,500	7,500	7,500
Ending work in process	1,200	360	1,200
Total units to account for	8,700	7,860	8,700
Costs to account for	**Materials**	**Conversion**	**Total**
Beginning work in process	0	0	0
Incurred during the period	$10,353	$26,970	$37,323
Total costs to account for	$10,353	$26,970	$37,323
Equivalent units	8,700	7,860	
Cost per equivalent unit	$ 1.19	$ 3.43	$ 4.62

Figure 8.72 *By: Rice University Openstax CC BY NC SA Long Description*

Long Descriptons

Units to account for: Beginning WIP -, Units started into production 8,700, Total units to account for 8,700. Total units, 100 percent Materials Units, 35 percent Conversion Units, respectively: Units accounted for: Completed and transferred out 7,500, 7500, 7,500; Ending WIP 1,200, 1,200, 420; Total equivalent units to account for 8,700, 8,700, 7,920. Costs to account for: Beginning WIP $0, 0, 0; Incurred during the period $32,355, 10,179, 22,176; Total costs to account for $32,355, 10,179, 22,176; Equivalent units –, 8,700, 7,920; Cost per equivalent unit $3.97, 1.17, 2.80; Value of ending WIP $2,580, 1,404, 1,176; Completed and transferred $29,775, 8,775, 21,000; Total costs $32,355, 10,179, 22,176. Return

Units to account for: Beginning WIP 0, Units started into production 8,700, Total units to account for 8,700. Total units,

100 percent Materials Units, 30 percent Conversion Units, respectively: Units accounted for: Completed and transferred out 7,500, 7500, 7,500; Ending WIP 1,200, 1,200, 360; Total units to account for 8,700, 8,700, 7,860; Costs to account for: Beginning WIP $0, 0, 0; Incurred during the period $37,323, 10,353, 26,970; Total costs to account for $37,323, 10,353, 26,970; Equivalent units –, 8,700, 7,860; Cost per equivalent unit $4.62, 1.19, 3.43. Return

8.13 Journal Entries in Process Costing

Calculating the costs associated with the various processes within a process costing system is only a part of the accounting process. Journal entries are used to record and report the financial information relating to the transactions. The example that follows illustrates how the journal entries reflect the process costing system by recording the flow of goods and costs through the process costing environment.

Purchased Materials for Multiple Departments

Each department within Rock City Percussion has a separate work in process inventory account. Raw materials totaling $33,500 were ordered prior to being requisitioned by each department: $25,000 for the shaping department and $8,500 for the packaging department. The July 1 journal entry to record the purchases on account is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Raw Materials Inventory	33,500	
	Accounts Payable		33,500
	To record purchase of raw materials		

Figure 8.79 *By: Rice University Openstax CC BY NC SA*

Direct Materials Requisitioned by the Shaping and Packaging Departments and

Indirect Material Used

During July, the shaping department requisitioned $10,179 in direct material. Similar to job order costing, indirect material costs are accumulated in the manufacturing overhead account. The overhead costs are applied to each department based on a predetermined overhead rate. In the example, assume that there was an indirect material cost for water of $400 in July that will be recorded as manufacturing overhead. The journal entry to record the requisition and usage of direct materials and overhead is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Work in Process Inventory: Shaping Department Manufacturing Overhead Materials Inventory *To record direct and indirect material cost for July in the Shaping Department*	10,179 400	 10,579

Figure 8.80 *By: Rice University Openstax CC BY NC SA*

During July, the packaging department requisitioned $2,000 in direct material and overhead costs for indirect material totaled $300 for the month of July. The journal entry to record the requisition and usage of materials is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Work in Process Inventory: Packaging Department Manufacturing Overhead Materials Inventory *To record direct and indirect material cost for July in the Packaging Department*	2,000 300	 2,300

Figure 8.81 *By: Rice University Openstax CC BY NC SA*

Direct Labor Paid by All Production Departments

During July, the shaping department incurred $15,000 in direct labor costs and $600 in indirect labor. The journal entry to record the labor costs is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Work in Process Inventory: Shaping Department Manufacturing Overhead Wages Payable *To record direct and indirect labor for July in the Shaping Department*	15,000 600	 15,600

Figure 8.82 *By: Rice University Openstax CC BY NC SA*

During July, the packaging department incurred $13,000 of direct labor costs and indirect labor of $1,000. The journal entry to record the labor costs is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Work in Process Inventory: Packaging Department Manufacturing Overhead Wages Payable *To record direct and indirect labor for July in the Packaging Department*	13,000 1,000	 14,000

Figure 8.83 *By: Rice University Openstax CC BY NC SA*

Applied Manufacturing Overhead to All Production Departments

Manufacturing overhead includes indirect material, indirect labor, and other types of manufacturing overhead. It is difficult, if not impossible, to trace manufacturing overhead to a specific

product, and yet, the total cost per unit needs to include overhead in order to make management decisions.

Overhead costs are accumulated in a manufacturing overhead account and applied to each department on the basis of a predetermined overhead rate. Properly allocating overhead to each department depends on finding an activity that provides a fair basis for the allocation. It needs to be an activity common to each department and influential in driving the cost of manufacturing overhead. In traditional costing systems, the most common activities used are machine hours, direct labor in dollars, or direct labor in hours. If the number of machine hours can be related to the manufacturing overhead, the overhead can be applied to each department based on the machine hours. The formula for overhead allocation is:

$$\text{Overhead Allocation} = \frac{\text{Estimated Overhead Costs (\$)}}{\text{Expected Annual Activity (machine hours)}}$$

Figure 8.84 *By: Rice University Openstax CC BY NC SA*

Rock City Percussion determined that machine hours is the appropriate base to use when allocating overhead. The estimated annual overhead cost is $340,000 per year. It was also estimated that the total machine hours will be 34,000 hours, so the allocation rate is computed as:

$$\frac{\text{Estimated Overhead Costs (\$340,000)}}{\text{Expected Annual Activity (34,000)}} = \text{\$10 per machine hour}$$

Figure 8.85 *By: Rice University Openstax CC BY NC SA*

The shaping department used 700 machine hours, and with an overhead application rate of $10 per direct labor hour, the journal entry to record the overhead allocation is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Work in Process Inventory: Shaping Department Manufacturing Overhead *To record overhead applied to the Shaping Department*	7,000	7,000

Figure 8.86 *By: Rice University Openstax CC BY NC SA*

The finishing department used 910 machine hours, and with an overhead application rate of $10 per direct labor hour, the journal entry to record the overhead allocation is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Work in Process Inventory: Finishing Department Manufacturing Overhead *To record overhead applied to the Finishing Department*	9,100	9,100

Figure 8.87 *By: Rice University Openstax CC BY NC SA*

Transferred Costs of Finished Goods from the Shaping Department to the Packaging Department

When the units are transferred from the shaping department to the packaging department, they are transferred at $3.97 per unit, as calculated previously. The amount transferred from the shaping department is the same amount listed on the production cost report in Figure 8.88. The journal entry is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Work in Process Inventory: Finishing Department Work in Process Inventory: Shaping Department *To record the weighted-average method of the cost of goods transferred from the Shaping Department to the Packaging Department*	29,775	29,775

Figure 8.88 *By: Rice University Openstax CC BY NC SA*

One or more interactive elements has been excluded from this version of the text. You can view them online here: https://psu.pb.unizin.org/acctg211/?p=1397#oembed-1

Transferred Goods from the Packaging Department to Finished Goods

The computation of inventory for the packaging department is shown in Figure 8.89.

Costs to Account For		**Units to Account For**	
Beginning work in process	$ 8,180	Beginning WIP	750
Direct material	2,000	Units started into production	7,500
Direct labor	13,000	Total units to account for:	8,250
Applied overhead	9,100		
Transferred in	29,775		
Total costs to account for	$62,055		

Step 1: Units to Assign Costs

Completed and transferred out	6,500
Ending work in process	1,750
Total units to account for	8,250

Step 2: Computing Equivalent Units of Production

Work in process completion %		40%	
	Material Units	**Conversion Units**	**Total**
Completed and transferred out	6,500	6,500	6,500
Ending work in process	1,750	700	1,750
Total units to account for	8,250	7,200	8,250

Step 3: Determining Cost per Equivalent Unit

Costs to account for	**Materials**	**Conversion**	**Total**
Beginning work in process	$ 1,600	$ 6,580	$ 8,180
Incurred during the period	$10,775	$43,100	$53,875
Total costs to account for	$12,375	$49,680	$62,055
Equivalent units	8,250	7,200	
Cost per equivalent unit for department	$ 1.50	$ 6.90	$ 8.40

Step 4: Allocating the Costs to Units Transferred to Finished Goods and Partially Completed Units

Transferred-out costs	(6,500 units × $1.50) + (6,500 units × $8.40) =	$54,600
End work in process: materials	(1,750 × $1.50) = $2,625	
End work in process: conversion	(700 × $6.90) = $4,830	
End work in process: total	$2,625 + $4,830 =	7,455
Total Costs Accounted For		$62,055

Figure 8.89 Inventory Computation for Packaging Department *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

The value of the inventory transferred to finished goods in the production cost report is the same as in the journal entry:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Finished Goods Inventory Work in Process Inventory: Packaging Department *To transfer completed goods into Finished Goods*	54,600	54,600

Figure 8.90 *By: Rice University Openstax CC BY NC SA*

Recording the Cost of Goods Sold Out of the Finished Goods Inventory

Each unit is a package of two drumsticks that cost $8.40 to make and sells for $24.99. There are two transactions when recording a sale. One entry is to transfer the inventory from finished goods inventory to cost of goods sold and is at the cost of the product. The second transaction is to record the sale at the sales price. The compound entry to record both transactions for the sale of 500 units on account is:

JOURNAL			
Date	**Account**	**Debit**	**Credit**
July 1	Cost of Goods Sold Finished Goods Inventory *To record the manufacturing costs of items sold*	4,200	4,200
July 1	Accounts Receivable Sales *To record the sale of 500 units*	12,495	12,495

Figure 8.91 *By: Rice University Openstax CC BY NC SA*

Long Description

Costs to account for: Beginning WIP materials 1,600, Beginning WIP Conversion 6,580 Direct Material $2,000, Direct Labor 13,000, Applied Overhead 9,100, Transferred In materials 8,775,

Transferred in conversion 21,000 equals Total Costs to Account for $62,055 Units to account for: Beginning WIP 750, Units started into production 7,500, Total units to account for 8,250. Step 1: Units to Assign Costs: Completed and transferred out 6,500, Ending WIP 1,750, Total units to account for 8,250. Step 2: Computing Equivalent Units of Production (WIP completion 40%); Total units, 100 percent Materials Unit, 40 percent Conversion Units, respectively: Completed and transferred out 6,600, 6,500, 6,500; Ending WIP 1,750, 1,750, 700; Total units to account for 8,250, 8,250, 7,200. Step 3: Determining Cost per Equivalent Unit; Costs to account for: Beginning WIP $8,180, 1,600, 6,580; Incurred during the period $26,100, 2,000, 22,100; Transferred in $29,775, 8,775, 21,000; Total costs to account for 62,055, 12,375, 49,680 Equivalent units –, 8250, 7,200; Cost per equivalent unit for dep't 8.40, 1.50, 6.90. Step 4: Allocating the Costs to Units Transferred to Finished Goods and Partially Completed Units; Transferred out costs (6,500 units times $1.50) plus (6,500 units times $6.90) equals 54,600; End. WIP: materials (1,750 times $1.50) equals $2,625; End. WIP: conversion (700 times $6.90) equals $4,830; End WIP total $2,625 plus 4,830 equals 7,455; Costs to account for $62,055. Return

CHAPTER 10- BUDGETING, STANDARD COSTS AND VARIANCES

Budgets

10.1 Budgeting Basics

The Basics of Budgeting

All companies—large and small—have limits on the amount of money or resources they can receive and pay out. How these resources are used to reach their goals and objectives must be planned. The quantitative plan estimating when and how much cash or other resources will be received and when and how the cash or other resources will be used is the budget. As you've learned, some of the benefits of budgeting include improved communication, planning, coordination, and evaluation.

All budgets are quantitative plans for the future and will be constructed based on the needs of the organization for which the budget is being created. Depending on the complexity, some budgets can take months or even years to develop. The most common time period covered by a budget is one year, although the time period may vary from strategic, long-term budgets to very detailed, short-term budgets. Generally, the closer the company is to the start of the budget's time period, the more detailed the budget becomes.

Management begins with a vision of the future. The long-term vision sets the direction of the company. The vision develops into goals and strategies that are built into the budget and are directly or indirectly reflected on the master budget.

The master budget has two major categories: the financial budget and the operating budget. The financial budget plans the use of assets and liabilities and results in a projected balance sheet. The operating budget helps plan future revenue and expenses and results in a projected income statement. The

operating budget has several subsidiary budgets that all begin with projected sales. For example, management estimates sales for the upcoming few years. It then breaks down estimated sales into quarters, months, and weeks and prepares the sales budget. The sales budget is the foundation for other operating budgets. Management uses the number of units from the sales budget and the company's inventory policy to determine how many units need to be produced. This information in units and in dollars becomes the production budget.

The production budget is then broken up into budgets for materials, labor, and overhead, which use the standard quantity and standard price for raw materials that need to be purchased, the standard direct labor rate and the standard direct labor hours that need to be scheduled, and the standard costs for all other direct and indirect operating expenses. Companies use the historic quantities of the amount of material per unit and the hours of direct labor per unit to compute a standard used to estimate the quantity of materials and labor hours needed for the expected level of production. Current costs are used to develop standard costs for the price of materials, the direct labor rate, as well as an estimate of overhead costs.

The budget development process results in various budgets for various purposes, such as revenue, expenses, or units produced, but they all begin with a plan. To save time and eliminate unnecessary repetition, management often starts with the current year's budget and adjusts it to meet future needs.

There are various strategies companies use in adjusting the budget amounts and planning for the future. For example, budgets can be derived from a top-down approach or from a bottom-up approach. Figure 10.1 shows the general difference between the top-down approach and the bottom-up approach. The top-down approach typically begins with senior

management. The goals, assumptions, and predicted revenue and expenses information are passed from the senior manager to middle managers, who further pass the information downward. Each department must then determine how it can allocate its expenses efficiently while still meeting the company goals. The benefit of this approach is that it ties in to the strategic plan and company goals. Another benefit of passing the amount of allowed expenses downward is that the final anticipated costs are reduced by the *vetting* (fact checking and information gathering) process.

In the top-down approach, management must devote attention to efficiently allocating resources to ensure that expenses are not padded to create budgetary slack. The drawback to this approach to budgeting is that the budget is prepared by individuals who are not familiar with specific operations and expenses to understand each department's nuances.

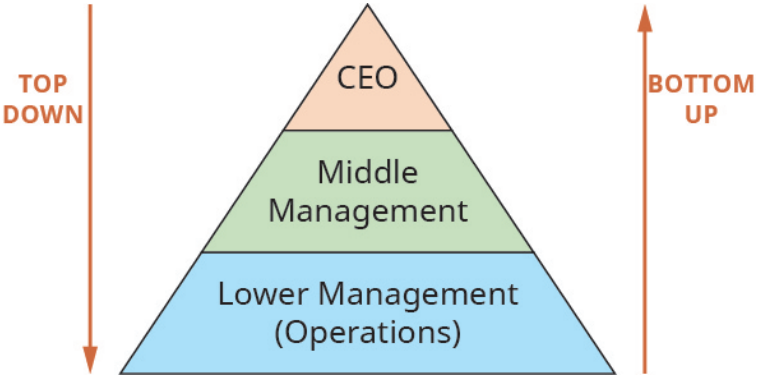


Figure 10.1 Top-Down versus Bottom-Up Approach to Budgeting *The top-down approach to budgeting starts with upper-level management, while the bottom-up approach starts with input from lower-level management. By: Rice University OpenStax CC BY-NC-SA 4.0*

The bottom-up approach (sometimes also named a self-

imposed or participative budget) begins at the lowest level of the company. After senior management has communicated the expected departmental goals, the departments then plans and predicts their sales and estimates the amount of resources needed to reach these goals. This information is communicated to the supervisor, who then passes it on to upper levels of management. The advantages of this approach are that managers feel their work is valued and that knowledgeable individuals develop the budget with realistic numbers. Therefore, the budget is more likely to be attainable. The drawback is that managers may not fully understand or may misunderstand the strategic plan.

Other approaches in addition to the top-down and bottom-up approaches are a combination approach and the zero-based budgeting approach. In the combination approach, guidelines and targets are set at the top while the managers work to develop a budget within the targeted parameters.

Zero-based budgeting begins with zero dollars and then adds to the budget only revenues and expenses that can be supported or justified. Figure 10.2 illustrates the difference between traditional budget preparation and zero-based budgeting in a bottom-up budgeting scenario. The advantage to zero-based budgeting is that unnecessary expenses are eliminated because managers cannot justify them. The drawback is that every expense needs to be justified, including obvious ones, so it takes a lot of time to complete. A compromise tactic is to use a zero-based budgeting approach for certain expenses, like travel, that can be easily justified and linked to the company goals.

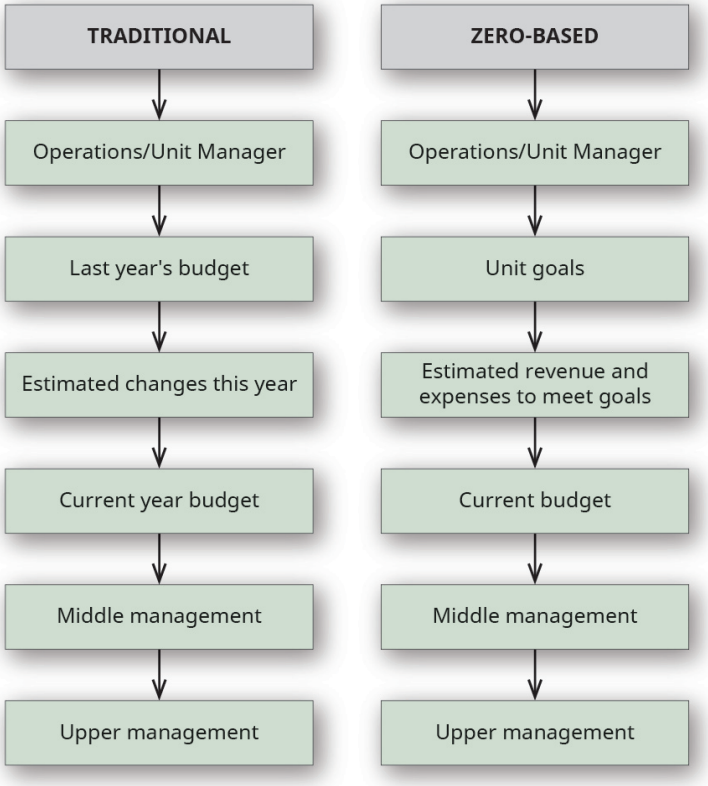


Figure 10.2 Comparison of Traditional Budgeting Process and Zero-Based Budgeting Process *In a bottom-up budgeting environment, the budget process begins with lower level or operational management. Under a traditional budgeting, last year's budget would be the starting point for creating the current budget. Under a zero-based budgeting approach, all budget numbers are derived newly each year or budget cycle. By: Rice University OpenStax CC BY-NC-SA 4.0*

Often budgets are developed so they can adjust for changes in the volume or activity and help management make decisions. Changes and challenges can affect the budget and have an impact on a company's plans. A flexible budget adjusts the cost

of goods produced for varying levels of production and is more useful than a static budget, which remains at one amount regardless of the production level. A flexible budget is created at the end of the accounting period, whereas the static budget is created before the fiscal year begins.

Additionally Figure 10.3 shows a comparison of a static budget and a flexible budget for Bingo's Bags, a company that produces purses and backpacks. In the flexible budget, the budgeted costs are calculated with actual sales, whereas in the static budget, budgeted costs are calculated with budgeted sales. The flexible budget allows management to see what they would expect the budget to look like based on the actual sales and budgeted costs. Flexible budgets are addressed in greater detail in Prepare Flexible Budgets.

	Flexible budget			Static budget			Sales Volume Variance
	Budgeted Cost (A)	Actual Sales Volume (B)	Flexible Budget (A × B)	Budgeted Cost (C)	Budgeted Sales Volume (D)	Static Budget (C × D)	Flexible Budget – Static Budget (A × B) – (C × D)
Direct Materials							
Backpacks	$5.720	71,600	$409,552	$5.720	72,000	$411,840	$ (2,288) F
Purses	7.460	37,000	276,020	7.460	35,000	261,100	14,920 U
Total direct materials cost			**$685,572**			**$672,940**	**$12,632 U**
Direct labor							
Backpacks	$3.450	71,600	$247,020	$3.450	72,000	$248,400	$ (1,380) F
Purses	2.220	37,000	82,140	2.220	35,000	77,700	4,440 U
Total direct labor cost			**$329,160**			**$326,100**	**$ 3,060 U**
Variable Overhead (60% x Direct labor cost)							
Backpacks	$2.130	71,600	$152,508	$2.130	72,000	$153,360	$ (852) F
Purses	1.820	37,000	67,340	1.820	35,000	63,700	3,640 U
Total variable overhead cost			**$219,848**			**$217,060**	**$ 2,788 U**

Figure 10.3 Comparison of a Flexible Budget and a Static Budget *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

In order to handle changes that occur in the future, companies can also use a rolling budget, which is one that is continuously updated. While the company's goals may be multi-year, the rolling budget is adjusted monthly, and a new month is added as each month passes. Rolling budgets allow management to respond to changes in estimates or actual occurrences, but it

also takes management away from other duties as it requires continual updating. Figure 10.4 shows an example of how a rolling quarterly budget would work. Notice that as one month rolls off (is completed) another month is added to the budget so that four quarters of a year are always presented.

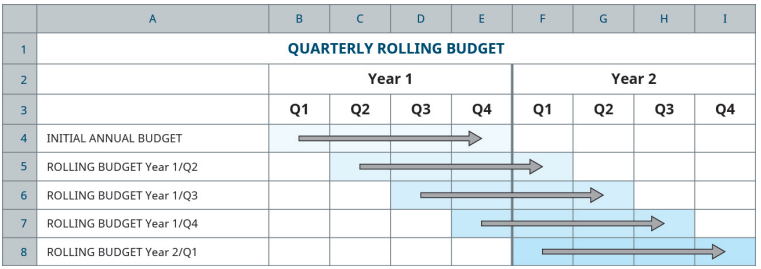


Figure 10.4 Rolling Budget *In a quarterly operating budget, the budget always projects forward for four months, or one quarter. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Because budgets are used to evaluate a manager's performance as well as the company's, managers are responsible for specific expenses within their own budget. Each manager's performance is evaluated by how well he or she manages the revenues and expenses under his or her control. Each individual who exercises control over spending should have a budget specifying limits on that spending.

The Role of the Master Budget

Most organizations will create a master budget—whether that organization is large or small, public or private, or a merchandising, manufacturing, or service company. A master budget is one that includes two areas, operational and financial, each of which has its own sub-budgets. The operating budget spans several areas that help plan and

manage day-to-day business. The financial budget depicts the expectations for cash inflows and outflows, including cash payments for planned operations, the purchase or sale of assets, the payment or financing of loans, and changes in equity. Each of the sub-budgets is made up of separate but interrelated budgets, and the number and type of separate budgets will differ depending on the type and size of the organization. For example, the sales budget predicts the sales expected for each quarter. The direct materials budget uses information from the sales budget to compute the number of units necessary for production. This information is used in other budgets, such as the direct materials budget, which plans when materials will be purchased, how much will be purchased, and how much that material should cost.

Figure 10.5 shows how operating budgets and financial budgets are related within a master budget.

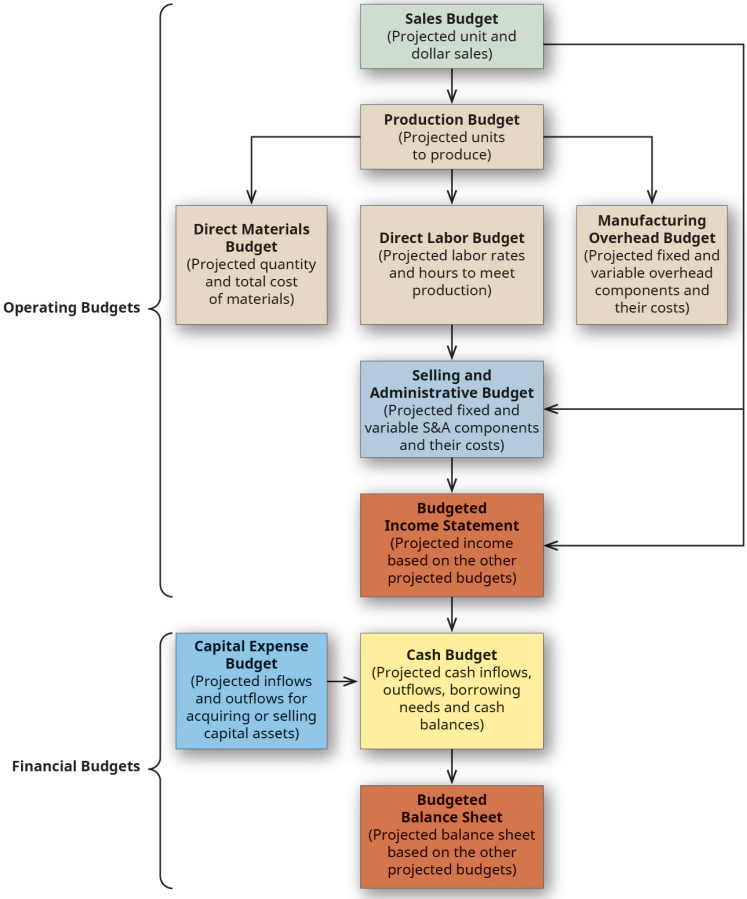


Figure 10.5 Operating Budgets, Financial Budgets, and the Relationship between Budgets *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

The Role of Operating Budgets

An operating budget consists of the sales budget, production budget, direct material budget, direct labor budget, and

overhead budget. These budgets serve to assist in planning and monitoring the day-to-day activities of the organization by informing management of how many units need to be produced, how much material needs to be ordered, how many labor hours need to be scheduled, and the amount of overhead expected to be incurred. The individual pieces of the operating budget collectively lead to the creation of the budgeted income statement. For example, Big Bad Bikes estimates it will sell 1,000 trainers for $70 each in the first quarter and prepares a sales budget to show the sales by quarter. Management understands that it needs to have on hand the 1,000 trainers that it estimates will be sold. It also understands that additional inventory needs to be on hand in the event there are additional sales and to prepare for sales in the second quarter. This information is used to develop a production budget. Each trainer requires 3.2 pounds of material that usually costs $1.25 per pound. Knowing how many units are to be produced and how much inventory needs to be on hand is used to develop a direct materials budget.

The direct materials budget lets managers know when and how much raw materials need to be ordered. The same is true for direct labor, as management knows how many units will be manufactured and how many hours of direct labor are needed. The necessary hours of direct labor and the estimated labor rate are used to develop the direct labor budget. While the materials and labor are determined from the production budget, only the variable overhead can be determined from the production budget. Existing information regarding fixed manufacturing costs are combined with variable manufacturing costs to determine the manufacturing overhead budget. The information from the sales budget is used to determine the sales and administrative budget. Finally, the sales, direct materials, direct labor, fixed manufacturing overhead budget, and sales and administrative budgets are used to develop a pro-forma income statement.

The Role of Financial Budgets

A financial budget consists of the cash budget, the budgeted balance sheet, and the budget for capital expenses. Similar to the individual budgets that make up the operating budgets, the financial budgets serve to assist with planning and monitoring the financing requirements of the organization. Management plans its capital asset needs and states them in the capital expense budget. Management addresses its collection and payment policies to determine when it will receive cash from sales and when it will pay the material, labor, and overhead expenses. The capital expense budget and the estimated payment and collection of cash allow management to build a cash budget and determine when it will need financing or have additional funds to pay back loans. These budgets taken together will be part of the budgeted balance sheet. Figure 10.5 shows how these budgets relate.

YOUR TURN

Maintaining a Cash Balance

DaQuan recently began work as a senior accountant at Mad Coffee Company. He learned he would be responsible for monitoring the cash balance because there is a bank loan requirement that a minimum balance of $10,000 be maintained with the bank at all times. DaQuan asked to see the cash budget so he could anticipate when the balance was most likely to go below $10,000. How can DaQuan determine potential cash balance issues by looking at the budget?

Solution

Budgeting helps plan for those times when cash is in short supply and bills need to be paid. Proper budgeting shows when and for how long a cash shortage may exist. DaQuan can see the months when the cash payments exceed the cash receipts and when the company is in danger of having a cash balance below the minimum requirement of $10,000. Knowing the inflow and outflow of cash will help him plan and manage the shortage through a line of credit, delay in purchasing, delay in hiring, or delay in payment of non-essential items.

Long Description

Columns (respectively) are Flexible Budget: Budgeted cost (A), Actual Sales Volume (B), Flexible Budget (A×B); Static Budget: Budgeted Cost (C), Budgeted Sales Volume (D), Static Budget (C×D); Sales Volume Variance: Flexible Budget-static budget (A×B) –(C×D); Direct Materials: Backpacks $5.720, 71,600, 409,552, 5.720, 72,000, 411,840, (2,288) F; Purses: 7.460, 37,000, 276,020, 7.460, 35,000, 261,100, 14,920 U; Total direct materials cost flexible budget is $685,572; Static Budget $672,940 for a sales volume variance of 12,632 U; Direct Labor: Backpacks $3.450, 71,600, 270,020, 3.450, 72,000, 248,400, (1,380) F; Purses: 2.220, 37,000, 82,140, 2.220, 35,000, 77,700, 4,440 U; Total direct labor cost flexible budget is $329,160; Static Budget $326,100 for a sales volume variance of 3,060 U; Variable Overhead (60% × Direct labor cost): Backpacks $2.130, 71,600, 152,508, 2.130, 72,000, 153,360, (852) F; Purses: 1,820, 37,000, 67,340, 1,820, 35,000, 63,700, 3,640 U; Total variable overhead cost flexible budget is $219,848; Static Budget $217,060 for a sales volume variance of 2,788 U. Return

A chart showing the Initial Annual Budget goes from quarter 1 year 1 to quarter 4 year 1; Rolling budget Year 1: Q2 goes from Q2, year 1 to Q1, year 2; Rolling budget Year 1: Q3 goes from Q3, year 1 to Q2, year 2; Rolling budget Year 1: Q4 goes from Q4 year

1 to Q3, year 2; Rolling budget Year 2: Q1 goes from Q1, year 2 to Q4, year 2. Return

A flow chart showing the relationship of budgets. The Operating Budgets: the Sales Budget (projected unit and dollar sales) has a line going down to the Production Budget (projected units to produce, which has a line going to three different budgets: Direct Materials Budget (projected quantity and total cost of materials), Direct Labor Budget (projected labor rates and hours to meet production, and the Manufacturing Overhead Budget (projected fixed and variable overhead components and their costs). The Direct Labor Budget and the Sales Budgets each have a line going down to the Selling and Administrative Budget (projected fixed and variable S&A components and their costs). This Selling and administrative Budget and the Sales Budgets each have a line going down to the Budgeted Income Statement (projected income based on the other projected budgets). The Financial Budgets: the Capital Expense Budget (projected inflows and outflows for acquiring or selling capital assets) and the Budgeted Income Statement each have a line going to the Cash Budget (projected cash inflows, outflows, borrowing needs and cash balances). The Cash Budget has a line going down to the Budgeted Balance Sheet (projected balance sheet based on the other projected budgets). Return

10.2 Operating Budgets

Operating budgets are a primary component of the master budget and involve examining the expectations for the primary operations of the business. Assumptions such as sales in units, sales price, manufacturing costs per unit, and direct material needed per unit involve a significant amount of time and input from various parts of the organization. It is important to obtain all of the information, however, because the more accurate the information, the more accurate the resulting budget, and the more likely management is to effectively monitor and achieve its budget goals.

Individual Operating Budgets

In order for an organization to align the budget with the strategic plan, it must budget for the day-to-day operations of the business. This means the company must understand when and how many sales will occur, as well as what expenses are required to generate those sales. In short, each component—sales, production, and other expenses—must be properly budgeted to generate the operating budget components and the resulting pro-forma budgeted income statement.

The budgeting process begins with the estimate of sales. When management has a solid estimate of sales for each quarter, month, week, or other relevant time period, they can determine how many units must be produced. From there, they determine the expenditures, such as direct materials necessary to produce the units. It is critical for the sales estimate to be accurate so that management knows how many units to produce. If the estimate is understated, the

company will not have enough inventory to satisfy customers, and they will not have ordered enough material or scheduled enough direct labor to manufacture more units. Customers may then shop somewhere else to meet their needs. Likewise, if sales are overestimated, management will have purchased more material than necessary and have a larger labor force than needed. This overestimate will cause management to have spent more cash than was necessary.

Sales Budget

The sales budget details the expected sales in units and the sales price for the budget period. The information from the sales budget is carried to several places in the master budget. It is used to determine how many units must be produced as well as when and how much cash will be collected from those sales.

For example, Big Bad Bikes used information from competitor sales, its marketing department, and industry trends to estimate the number of units that will be sold in each quarter of the coming year. The number of units is multiplied by the sales price to determine the sales by quarter as shown in Figure 10.6.

BIG BAD BIKES
Sales Budget
For the Year Ended December 31, 2019

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Expected Sales (Units)	1,000	1,000	1,500	2,500	6,000
Sales Price per Unit	$ 70	$ 70	$ 75	$ 75	
Total Sales Revenue	$70,000	$70,000	$112,500	$187,500	$440,000

Figure 10.6 Sales Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0*

The sales budget leads into the production budget to

determine how many units must be produced each week, month, quarter, or year. It also leads into the cash receipts budget, which will be discussed in 10.3 Financial Budgets.

Production Budget

Estimating sales leads to identifying the desired quantity of inventory to meet the demand. Management wants to have enough inventory to meet production, but they do not want too much in the ending inventory to avoid paying for unnecessary storage. Management often uses a formula to estimate how much should remain in ending inventory. Management wants to be flexible with its budgeting, wants to create budgets that can grow or shrink as needed, and needs to have inventory on hand. So the amount of ending inventory often is a percentage of the next week's, month's, or quarter's sales.

In creating the production budget, a major issue is how much inventory should be on hand. Having inventory on hand helps the company avoid losing a customer because the product isn't available. However, there are storage costs associated with holding inventory as well as having a lag time between paying to manufacture a product and receiving cash from selling that product. Management must balance the two issues and determine the amount of inventory that should be available.

When determining the number of units needed to be produced, start with the estimated sales plus the desired ending inventory to derive the maximum number of units that must be available during the period. Since the number of units in beginning inventory are already produced, subtracting the beginning inventory from the goods available results in the number of units that need to be produced.

After management has estimated how many units will sell

and how many units need to be in ending inventory, it develops the production budget to compute the number of units that need to be produced during each quarter. The formula is the reverse of the formula for the cost of goods sold.

Cost of Goods Sold	Number of Units Produced
Beginning Inventory	Goods Sold
+ Purchases (or produced)	+ Ending Inventory
Goods available for sale	Goods available for sale
– Ending Inventory	– Beginning Inventory

Figure 10.7 *By: Rice University Openstax CC BY NC SA 4.0*

The number of units expected to be sold plus the desired ending inventory equals the number of units that are available. When the beginning inventory is subtracted from the number of units available, management knows how many units must be produced during that quarter to meet sales.

In a merchandising firm, retailers do not produce their inventory but purchase it. Therefore, stores such as **Walmart** do not have raw materials and instead substitute the number of units to be purchased in place of the number of units to be produced; the result is the merchandise inventory to be purchased.

To illustrate the steps in developing a production budget, recall that Big Bad Bikes is introducing a new product that the marketing department thinks will have strong sales. For new products, Big Bad Bikes requires a target ending inventory of 30% of the next quarter's sales. Unfortunately, they were unable to manufacture any units before the end of the current year, so the first quarter's beginning inventory is 0 units. As shown in Figure 10.7, sales in quarter 2 are estimated at 1,000 units; since 30% is required to be in ending inventory, the ending inventory for quarter 1 needs to be 300 units. With expected

sales of 1,000 units for quarter 2 and a required ending inventory of 30%, or 300 units, Big Bad Bikes needs to have 1,300 units available during the quarter. Since 1,300 units needed to be available and there are zero units in beginning inventory, Big Bad Bikes needs to manufacture 1,300 units, as shown in Figure 10.8

BIG BAD BIKES
Production Budget
For the Year Ended December 31, 2019

	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Expected Sales	1,000	1,000	1,500	2,500
Desired Ending Inventory	300	450	750	1,050
Total Required Units	1,300	1,450	2,250	3,550
– Beginning Inventory	0	300	450	750
Required Production	1,300	1,150	1,800	2,800

Figure 10.8 Production Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

The ending inventory from one quarter is the beginning inventory for the next quarter and the calculations are all the same. In order to determine the ending inventory in quarter 4, Big Bad Bikes must estimate the sales for the first quarter of the next year. Big Bad Bikes's marketing department believes sales will increase in each of the next several quarters, and they estimate sales as 3,500 for the first quarter of the next year and 4,500 for the second quarter of the next year. Thirty percent of 3,500 is 1,050, so the number of units required in the ending inventory for quarter 4 is 1,050.

The number of units needed in production for the first quarter of the next year provides information needed for other budgets such as the direct materials budget, so Big Bad Bikes must also determine the number of units needed in production for that first quarter. The estimated sales of 3,500 and the desired ending inventory of 1,350 (30% of the next quarter's estimated sales of 4,500) determines that 4,850 units

are required during the quarter. The beginning inventory is estimated to be 1,050, which means the number of units that need to be produced during the first quarter of year 2 is 3,800.

The number of units needed to be produced each quarter was computed from the estimated sales and is used to determine the quantity of direct or raw material to purchase, to schedule enough direct labor to manufacture the units, and to approximate the overhead required for production. It is also necessary to estimate the sales for the first quarter of the next year. The ending inventory for the current year is based on the sales estimates for the first quarter of the following year. From this amount, the production budget and direct materials budget are calculated and flow to the operating and cash budget.

Direct Materials Budget

From the production budget, management knows how many units need to be produced in each budget period. Management is already aware of how much material it needs to produce each unit and can combine the direct material per unit with the production budget to compute the direct materials budget. This information is used to ensure the correct quantity of materials is ordered and the correct amount is budgeted for those materials.

Similar to the production budget, management wants to have an ending inventory available to ensure there are enough materials on hand. The direct materials budget illustrates how much material needs to be ordered and how much that material costs. The calculation is similar to that used in the production budget, with the addition of the cost per unit.

If Big Bad Bikes uses 3.2 pounds of material for each trainer it manufactures and each pound of material costs $1.25, we can create a direct materials budget. Management's goal is

to have 20% of the next quarter's material needs on hand as the desired ending materials inventory. Therefore, the determination of each quarter's material needs is partially dependent on the following quarter's production requirements. The desired ending inventory of material is readily determined for quarters 1 through 3 as those needs are based on the production requirements for quarters 2 through 4. To compute the desired ending materials inventory for quarter 4, we need the production requirements for quarter 1 of year 2. Recall that the number of units to be produced during the first quarter of year 2 is 3,800. Thus, quarter 4 materials ending inventory requirement is 20% of 3,800. That information is used to compute the direct materials budget shown in Figure 10.9.

BIG BAD BIKES
Direct Materials Budget
For the Year Ended December 31, 2019

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Units to be Produced	1,300	1,150	1,800	2,800	7,050
Direct Material per Unit	3.20	3.20	3.20	3.20	3.20
Total Pounds Needed for Production	4,160	3,680	5,760	8,960	22,560
+ Desired Ending Inventory	736	1,152	1,792	2,432	2,432
Total Material Required	4,896	4832	7,552	11,392	24,992
– Beginning Inventory	0	736	1,152	1,792	0
Pounds of Direct Material Required	4,896	4,096	6,400	9,600	24,992
Cost per Pound	$ 1.25	$ 1.25	$ 1.25	$ 1.25	$ 1.25
Total Cost of Direct Material Purchase	$6,120	$5,120	$8,000	$12,000	$31,240

Figure 10.9 Direct Materials Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Management knows how much the materials will cost and integrates this information into the schedule of expected cash disbursements, which will be shown in 10.3 Financial Budgets. This information will also be used in the budgeted income statement and on the budgeted balance sheet. With 6,000 units estimated for sale, 3.2 pounds of material per unit, and $1.25 per pound, the direct materials used represent $24,000

of the cost of goods sold. The remaining $7,240 is included in ending inventory as units completed and raw material.

Direct Labor Budget

Management uses the same information in the production budget to develop the direct labor budget. This information is used to ensure that the proper amount of staff is available for production and that there is money available to pay for the labor, including potential overtime. Typically, the number of hours is computed and then multiplied by an hourly rate, so the total direct labor cost is known.

If Big Bad Bikes knows that they need 45 minutes or 0.75 hours of direct labor for each unit produced, and the labor rate for this type of manufacturing is $20 per hour, the computation for direct labor simply begins with the number of units in the production budget. As shown in Figure 10.10, the number of units produced each quarter multiplied by the number of hours per unit equals the required direct labor hours needed to be scheduled in order to meet production needs. The total number of hours is next multiplied by the direct labor rate per hour, and the labor cost can be budgeted and used in the cash disbursement budget and operating budget illustrated in 10.3 Financial Budgets.

BIG BAD BIKES
Direct Labor Budget
For the Year Ended December 31, 2019

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Units to be Produced	1,300	1,150	1,800	2,800	7,050
Direct Labor Hours per Unit	00.75	00.75	00.75	00.75	00.75
Total Required Direct Labor Hours	975	862.50	1,350	2,100	5,287.50
Labor Cost per Hour	$ 20	$ 20	$ 20	$ 20	$ 20
Total Direct Labor Cost	$19,500	$17,250	$27,000	$42,000	$ 105,750

Figure 10.10 Direct Labor Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

The direct labor of $105,750 will be apportioned to the budgeted income statement and budgeted balance sheet. With 0.75 hours of direct labor per unit and $20 per direct labor hour, each unit will cost $15 in direct labor. Of the 7,050 units produced, 6,000 units will be sold, so $90,000 represents the labor portion of the cost of goods sold and will be shown on the income statement, while the remaining $15,750 will be the labor portion of ending inventory and will be shown on the balance sheet.

Manufacturing Overhead Budget

The manufacturing overhead budget includes the remainder of the production costs not covered by the direct materials and direct labor budgets. In the manufacturing overhead budgeting process, producers will typically allocate overhead costs depending upon their cost behavior production characteristics, which are generally classified as either variable or fixed. Based on this allocation process, the variable component will be treated as occurring proportionately in relation to budgeted activity, while the fixed component will be treated as remaining constant. This process is similar to the overhead allocation process you learned in studying product, process, or activity-based costing.

For Big Bad Bikes to create their manufacturing overhead budget, they first determine that the appropriate driver for assigning overhead costs to products is direct labor hours. The overhead allocation rates for the variable overhead costs are: indirect material of $1.00 per hour, indirect labor of $1.25 per hour, maintenance of $0.25 per hour, and utilities of $0.50 per hour. The fixed overhead costs per quarter are: supervisor salaries of $15,000, fixed maintenance salaries of $4,000, insurance of $7,000, and depreciation expenses of $3,000.

Given the direct labor hours for each quarter from the direct

labor budget, the variable costs are the number of hours multiplied by the variable overhead application rate. The fixed costs are the same for each quarter, as shown in the manufacturing overhead budget in Figure 10.11.

BIG BAD BIKES
Manufacturing Overhead Budget
For the Year Ended December 31, 2019

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Variable Costs					
Indirect Material	$ 975	$ 863	$ 1,350	$ 2,100	$ 5,288
Indirect Labor	1,219	1,078	1,688	2,625	6,609
Maintenance	244	216	338	525	1,322
Utilities	488	431	675	1,050	2,644
Total Variable Manufacturing Costs	$ 2,926	$ 2,588	$ 4,051	$ 6,300	$ 15,863
Fixed Costs					
Supervisory Salaries	$15,000	$15,000	$15,000	$15,000	$ 60,000
Maintenance Salaries	4,000	4,000	4,000	4,000	16,000
Insurance	7,000	7,000	7,000	7,000	28,000
Depreciation	3,000	3,000	3,000	3,000	12,000
Total Fixed Manufacturing Costs	$29,000	$29,000	$29,000	$29,000	$116,000
Total Manufacturing Overhead	$31,925	$31,588	$33,050	$35,300	$131,863

Figure 10.11 Manufacturing Overhead Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

The total manufacturing overhead cost was $131,863 for 7,050 units, or $18.70 per unit (rounded). Since 6,000 units are sold, $112,200 (6,000 units × $18.70 per unit) will be expensed as cost of goods sold, while the remaining $19,663 will be part of finished goods ending inventory.

Sales and Administrative Expenses Budget

The direct materials budget, the direct labor budget, and the manufacturing overhead budget plan for all costs related to production, while the selling and administrative expense budget contains a listing of variable and fixed expenses estimated to be incurred in all areas other than production costs. While this one budget contains all nonmanufacturing expenses, in practice, it actually comprises several small

budgets created by managers in sales and administrative positions. All managers must follow the budget, but setting an appropriate budget for selling and administrative functions is complicated and is not always thoroughly understood by managers without a background in managerial accounting.

If Big Bad Bikes pays a sales commission of $2 per unit sold and a transportation cost of $0.50 per unit, they can use these costs to put together their sales and administrative budget. All other costs are fixed costs per quarter: sales salaries of $5,000; administrative salaries of $5,000; marketing expenses of $5,000; insurance of $1,000; and depreciation of $2,000. The sales and administrative budget is shown in Figure 10.12, along with the budgeted sales used in the computation of variable sales and administrative expenses.

BIG BAD BIKES
Sales and Administrative Expense Budget
For the Year Ended December 31, 2019

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Budgeted Sales in Units	1,000	1,000	1,500	2,500	6,000
Variable Expenses					
Sales Commissions	2,000	2,000	3,000	5,000	12,000
Transportation	500	500	750	1,250	3,000
Total Variable Expenses	$ 2,500	$ 2,500	$ 3,750	$ 6,250	$15,000
Fixed Expenses					
Sales Salaries	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$20,000
Administrative Salaries	5,000	5,000	5,000	5,000	20,000
Marketing Expenses	5,000	5,000	5,000	5,000	20,000
Insurance Expenses	1,000	1,000	1,000	1,000	4,000
Depreciation Expenses	2,000	2,000	2,000	2,000	8,000
Total Fixed Expenses	$18,000	$18,000	$18,000	$18,000	$72,000
Total Selling and Administrative expenses	$20,500	$20,500	$21,750	$24,250	$87,000

Figure 10.12 Sales and Administrative Expense Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Only manufacturing costs are treated as a product cost and included in ending inventory, so all of the expenses in the sales and administrative budget are period expenses and included in the budgeted income statement.

Budgeted Income Statement

A budgeted income statement is formatted similarly to a traditional income statement except that it contains budgeted data. Once all of the operating budgets have been created, these costs are used to prepare a budgeted income statement and budgeted balance sheet. The manufacturing costs are allocated to the cost of goods sold and the ending inventory.

Big Bad Bikes uses the information on direct materials (Figure 10.9), direct labor (Figure 10.10), and manufacturing overhead (Figure 10.11) to allocate the manufacturing costs between the cost of goods sold and the ending work in process inventory, as shown in (Figure 10.13).

	Cost of Goods Sold	Ending Inventory	Total
Direct Materials	$ 24,000*	$ 7,240	$ 31,240
Direct Labor	90,000**	15,750	105,750
Manufacturing Overhead	112,200	19,639	131,863
Total	$226,224	$42,629	$268,853

*6,000 units × 3.2 lbs/unit × $1.25/lb
**6,000 units × 0.75 hr/unit × $20/hr

Figure 10.13 Allocating Costs to Cost of Goods Sold and Ending Work in Process Inventory for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0*

Once they perform this allocation, the budgeted income statement can be prepared. Big Bad Bikes estimates an interest of $954. It also estimates that $22,000 of its income will not be collected and will be reported as uncollectible expense. The budgeted income statement is shown in Figure 10.14.

BIG BAD BIKES Budgeted Income Statement For the Year Ended December 31, 2019	
Sales	$440,000
Cost of Goods Sold	226,200
Gross Profit	213,800
Sales and Administrative Expenses	87,000
Uncollectible Expense	22,000
Income before Interest	104,800
Interest Expense	954
Income Tax	4,000
Net Income	$ 99,846

Figure 10.14 Budgeted Income Statement for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Long Description

Big Bad Bikes, Sales budget, For the Year Ending December 31, 2019, Quarter 1, Quarter 2, Quarter 3, Quarter 4, and Total (respectively): Expected Sales (units), 1,000, 1,000, 1,500, 2,500, 6,000; Sales price per unit, $70, 70, 75, 75; Total sales revenue, $70,000, 70,000, 112,500, 187,500, $440,000. Return

Big Bad Bikes, Production Budget, For the Year Ending December 31, 2019, Quarter 1, Quarter 2, Quarter 3, Quarter 4 (respectively): Expected Sales, 1,000, 1,000, 1,500, 2,500, 6,000; Plus Desired ending inventory, 300, 450, 750, 1,050; Equals Total required units, 1,300, 1,450, 2,250, 3,550; Less: beginning inventory, 0, 300, 450, 750; Required production, 1,300, 1,150, 1,800, 2,800. Return

Big Bad Bikes, Direct Materials Budget, For the Year Ending December 31, 2019, Quarter 1, Quarter 2, Quarter 3, Quarter 4, and Total (respectively): Units to be produced, 1,300, 1,150, 1,800,

2,800, 7,050; Times Direct material per unit, 3.20 3.20 3.20 3.20 3.20; Total pounds needed for production, 4,160, 3,680, 5,760, 8,960, 22,560; Plus Desired ending inventory, 736, 1,152, 1,792, 2,432, 2,432; Equals Total material required, 4,876, 4,832, 7,552, 11,392, 24,992; Less beginning inventory, 0, 736, 1,152, 1,792, 0; Equals Pounds of direct material required, 4,896, 4,096, 6,400, 9,600, 24,992; Cost per pound, $1.25, 1.25, 1.25, 1.25, 1.25; Total cost of direct material purchase, $6,120, 5,120, 8,000, 12,000, 31,240. Return

Big Bad Bikes, Direct Labor Budget, For the Year Ending December 31, 2019, Quarter 1, Quarter 2, Quarter 3, Quarter 4, and Total (respectively): Units to be produced, 1,300, 1,150, 1,800, 2,800, 7,050; Times Direct labor hours per unit, .75, .75, .75, .75, .75; Total required direct labor hours, 975, 862.50, 1,350, 2,100, 5,287.50; Labor cost per hour, $20, 20, 20, 20, 20; Total direct labor cost, $19,500, 17,250, 27,000, 42,000, 105,750. Return

Big Bad Bikes, Manufacturing Overhead Budget, For the Year Ending December 31, 2019, Quarter 1, Quarter 2, Quarter 3, Quarter 4, and Total (respectively): Variable costs: Indirect material, 975, 863, 1,350, 2,100, 5,288; Indirect labor, 1,219, 1,078, 1,688, 2,625, 6,609; Maintenance, 244, 216, 338, 525, 1,322; Utilities, 488, 431, 675, 1,050, 2,644; Total variable manufacturing costs, $2,925, 2,588, 4,050, 6,300, 15,863; Fixed costs (same for each quarter): Supervisory salaries $15,000, Maintenance salaries 4,000, Insurance 7,000, Depreciation 3,000; Total fixed manufacturing costs $29,000. Total fixed costs for the year are 60,000, 16,000, 28,000, 12,000, respectively. Total manufacturing overhead, $31,925, 31,588, 33,050, 35,300, 131,863. Return

Big Bad Bikes, Sales and Administrative Budget, For the Year Ending December 31, 2019, Quarter 1, Quarter 2, Quarter 3, Quarter 4, and Total (respectively): Budgeted sales in units, 1,000, 1,000, 1,500, 2,500, 6,000; Variable expenses: Sales commissions, 2,000, 2,000, 3,000, 5,000, 12,000; Transportation, 500, 500, 750, 1,250, 3,000; Total variable expenses $2,500, 2,500, 3,750, 6,250, 15,000; Fixed Expenses (same for each quarter):

Sales salaries $5,000, Administrative salaries 5,000, Marketing expenses 5,000, Insurance expenses 1,000, Depreciation expenses 2,000 for a total of $18,000. Total fixed expenses for the year are 20,000, 20,000, 20,000, 4,000, 8,000, 72,000 respectively. Total selling and administrative expenses, 20,500, 20,500, 21,750, 24,250, 87,000. Return

Big Bad Bikes, Budgeted Income Statement, For the Year Ending December 31, 2019: Sales, $440,000 plus cost of goods sold $226,224 equals gross profit $213,776; Less: sales and administrative expenses $87,000 and uncollectible expense $22,000 equals income before interest $104,776; Less: interest expense $954 and income tax $4,000 equals net income $99,822. Return

10.3 Financial Budgets

Now that you have developed an understanding of operating budgets, let's turn to the other primary component of the master budget: financial budgets. Preparing financial budgets involves examining the expectations for financing the operations of the business and planning for the cash needs of the organization. The budget helps estimate the source, amount, and timing of cash collection and cash payments as well as determine if and when additional financing is needed or debt can be paid.

Individual Financial Budgets

Preparing a financial budget first requires preparing the capital asset budget, the cash budgets, and the budgeted balance sheet. The capital asset budget represents a significant investment in cash, and the amount is carried to the cash budget. Therefore, it needs to be prepared before the cash budget. If the cash will not be available, the capital asset budget can be adjusted and, again, carried to the cash budget.

When the budgets are complete, the beginning and ending balance from the cash budget, changes in financing, and changes in equity are shown on the budgeted balance sheet.

Capital Asset Budget

The capital asset budget, also called the capital expenditure budget, shows the company's plans to invest in long-term assets. Some assets, such as computers, must be replaced

every few years, while other assets, such as manufacturing equipment, are purchased very infrequently. Some assets can be purchased with cash, whereas others may require a loan. Budgeting for these types of expenditures requires long-range planning because the purchases affect cash flows in current and future periods and affect the income statement due to depreciation and interest expenses.

Cash Budget

The cash budget is the combined budget of all inflows and outflows of cash. It should be divided into the shortest time period possible, so management can be quickly made aware of potential problems resulting from fluctuations in cash flow. One goal of this budget is to anticipate the timing of cash inflows and outflows, which allows a company to try to avoid a decrease in the cash balance due to paying out more cash than it receives. In order to provide timely feedback and alert management to short-term cash needs, the cash flow budget is commonly geared toward monthly or quarterly figures. Figure 10.15 shows how the other budgets tie into the cash budget.

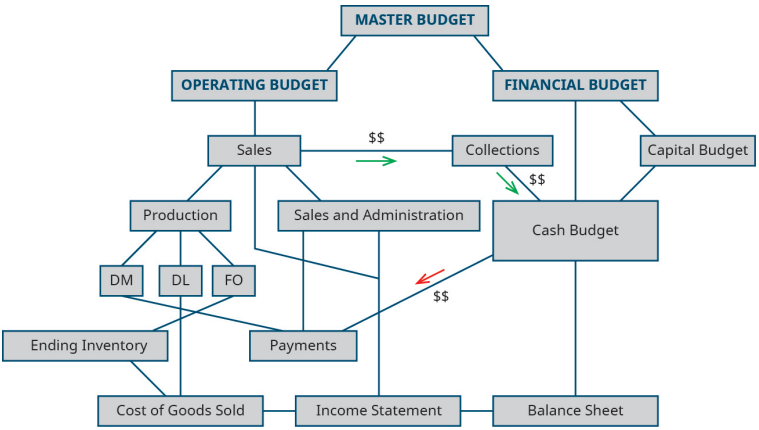


Figure 10.15 Relationship between Budgets *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Cash is so important to the operations of a company that, often, companies will arrange to have an emergency cash source, such as a *line of credit*, to avoid defaulting on current payables due and also to protect against other unanticipated expenses, such as major repair costs on equipment. This line of credit would be similar in function to the *overdraft protection* offered on many checking accounts.

Because the cash budget accounts for every inflow and outflow of cash, it is broken down into smaller components. The cash collections schedule includes all of the cash inflow expected to be received from customer sales, whether those customers pay at the same rate or even if they pay at all. The cash collections schedule includes all the cash expected to be received and does not include the amount of the receivables estimated as uncollectible. The cash payments schedule plans the outflow or payments of all accounts payable, showing when cash will be used to pay for direct material purchases. Both the cash collections schedule and the cash payments schedule are included along with other cash transactions in

a cash budget. The cash budget, then, combines the cash collection schedule, the cash payment schedule, and all other budgets that plan for the inflow or outflow of cash. When everything is combined into one budget, that budget shows if financing arrangements are needed to maintain balances or if excess cash is available to pay for additional liabilities or assets.

The operating budgets all begin with the sales budget. The cash collections schedule does as well. Since purchases are made at varying times during the period and cash is received from customers at varying rates, data are needed to estimate how much will be collected in the month of sale, the month after the sale, two months after the sale, and so forth. Bad debts also need to be estimated, since that is cash that will not be collected.

To illustrate, let's return to Big Bad Bikes. They believe cash collections for the trainer sales will be similar to the collections from their bicycle sales, so they will use that pattern to budget cash collections for the trainers. In the quarter of sales, 65% of that quarter's sales will be collected. In the quarter after the sale, 30% will be collected. This leaves 5% of the sales considered uncollectible. Figure 10.16 illustrates when each quarter's sales will be collected. An estimate of the net realizable balance of Accounts Receivable can be reconciled by using information from the cash collections schedule:

Quarter 4: Beginning balance of Accounts Receivable (Quarter 3 Sales of $112,500 × 30%)	$ 33,750
+ Quarter 4: Sales	187,500
– Quarter 4: Cash Receipts (65% of Quarter 4 Sales)	121,875
= Quarter 4: Ending Balance in Gross Accounts Receivable	$ 99,375

Note the Ending Balance is gross accounts receivable which includes the 5% estimated uncollectible, but that amount would be excluded from net realizable accounts receivable.

Figure 10.16 *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

	Percentage of Sales Collected			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Prior year, Quarter 4 Sales	30%			
Quarter 1 Sales	65%	30%		
Quarter 2 Sales		65%	30%	
Quarter 3 Sales			65%	30%
Quarter 4 Sales				65%

Figure 10.17 Illustration of a Cash Collections Schedule *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

For example, in quarter 1 of year 2, 65% of the quarter 1 sales will be collected in cash, as well as 30% of the sales from quarter 4 of the prior year. There were no sales in quarter 4 of the prior year so 30% of zero sales shows the collections are $0. Using information from Big Bad Bikes sales budget, the cash collections from the sales are shown in Figure 10.18.

BIG BAD BIKES Cash Collections Schedule For the Year Ended December 31, 2019						
	Sales	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Collections from prior year Quarter 4	0	0				
Quarter 1	$ 70,000	$45,500	$21,000			$ 66,500
Quarter 2	70,000		45,500	$21,000		66,500
Quarter 3	112,500			73,125	$ 33,750	106,875
Quarter 4	187,500				121,875	121,875
Total Collections	$440,000	$45,500	$66,500	$94,125	$155,625	$361,750
Accounts Receivable	$ 78,250					

Figure 10.18 Cash Collections Schedule for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

When the cash collections schedule is made for sales, management must account for other potential cash collections such as cash received from the sale of equipment or the issuance of stock. These are listed individually in the cash inflows portion of the cash budget.

The cash payments schedule, on the other hand, shows

when cash will be used to pay for Accounts Payable. One such example are direct material purchases, which originates from the direct materials budget. When the production budget is determined from the sales, management prepares the direct materials budget to determine when and how much material needs to be ordered. Orders for materials take place throughout the quarter, and payments for the purchases are made at different intervals from the orders. A schedule of cash payments is similar to the cash collections schedule, except that it accounts for the company's purchases instead of the company's sales. The information from the cash payments schedule feeds into the cash budget.

Big Bad Bikes typically pays half of its purchases in the quarter of purchase. The remaining half is paid in the following quarter, so payments in the first quarter include payments for purchases made during the first quarter as well as half of the purchases for the preceding quarter. Figure 10.19 shows when each quarter's purchases will be paid. Additionally, the balance of purchases in Accounts Payable can be reconciled by using information from the cash payment schedule as follows:

Quarter 4: Beginning balance of Accounts Payable	$ 4,000*
+ Quarter 4: purchase of direct material	12,000
– Quarter 4: Cash Payments	10,000
= Quarter 4: Ending balance in Accounts Payable	$ 6,000*

* Big Bad Bikes has a policy of paying 50% of purchases in the quarter of purchases, and the remaining 50% the month after the purchase. The beginning balance of accounts payable should be 50% of the prior quarter's purchases.

Figure 10.19 *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

	Percentage of Cash Payments for Purchases			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Prior year, Quarter 4 Purchases	50%			
Quarter 1 Purchases	50%	50%		
Quarter 2 Purchases		50%	50%	
Quarter 3 Purchases			50%	50%
Quarter 4 Purchases				50%

Figure 10.20 Cash Payment Schedule *By: Rice University OpenStax CC BY-NC-SA 4.0*

The first quarter of the year plans cash payments from the prior quarter as well as the current quarter. Again, since the trainers are a new product, in this example, there are no purchases in the preceding quarter, and the payments are $0. Figure 10.21.

BIG BAD BIKES
Cash Payments Schedule
For the Year Ended December 31, 2019

Payments	Purchases	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Quarter 4, prior year	$ 0	$ 0				
Quarter 1	6,120	3,060	$3,060			$ 6,120
Quarter 2	5,120		2,560	$2,560		5,120
Quarter 3	8,000			4,000	$ 4,000	8,000
Quarter 4	12,000				6,000	6,000
Total payments	$31,240	$3,060	$5,620	$6,560	$10,000	$25,240
Accounts Payable	$ 6,000					

Figure 10.21 Cash Payments Schedule for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

While the cash payments schedule is made for purchases of material on account, there are other outflows of cash for the company, and management must estimate all other cash payments for the year. Typically, this includes the manufacturing overhead budget, the sales and administrative budget, the capital asset budget, and any other potential payments of cash. Since depreciation is an expense not requiring cash, the cash budget includes the amount from the budgets less depreciation. Cash payments are listed on

the cash budget following cash receipts. Figure 10.22 shows the major components of the cash budget.

JOB COST SHEET
General Overview of Cash Budget Components*

Cash Receipts from Sales
+ Other cash receipts (issuance of stock, borrowing money, receiving interest or dividends, from selling assets such as equipment, etc.)
– Cash Payments for Purchases or Production of Inventory
– Cash Payments for manufacturing expenses**
– Cash Payments for selling and administrative expenses**
– Cash payments for capital asset purchases
– Other cash payments (paying interest, paying loan payments, etc.)
= Net Cash

*This is a general overview of the types of cash transactions that might appear in a cash budget and is representative of the components but not of a typical presentation of those components
**Note that depreciation, a non-cash expense, would be excluded from these expenses

Figure 10.22 General Overview of Cash Budget Components *A cash budget will contain all the budgeted cash inflows and out flows from the sub-budgets as well as any cash items that might not appear on one of the sub-budgets. By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

The cash budget totals the cash receipts and adds it to the beginning cash balance to determine the available cash. From the available cash, the cash payments are subtracted to compute the net cash excess or deficiency of cash for the quarter. This amount is the potential ending cash balance. Organizations typically require a minimum cash balance. If the potential ending cash balance does not meet the minimum amount, management must plan to acquire financing to reach that amount. If the potential ending cash balance exceeds the minimum cash balance, the excess amount may be used to pay any financing loans and interest.

Big Bad Bikes has a minimum cash balance requirement of $10,000 and has a line of credit available for an interest rate of 19%. They also plan to issue additional capital stock for $5,000 in the first quarter, to pay taxes of $1,000 during each quarter, and to purchase a copier for $8,500 cash in the third quarter.

The beginning cash balance for Big Bad Bikes is $13,000, which can be used to create the cash budget shown in Figure 10.23.

BIG BAD BIKES Cash Budget For the Year Ended December 31, 2019					
	Quarter 1	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Total**
Beginning Cash Balance	$13,000	$10,000	$ 10,000	$ 10,000	$ 13,000
Collections from Customers (Cash Collections Schedule)	45,500	66,500	94,125	155,625	361,750
Issuing of Stock	5,000				5,000
Total Cash Collected during the Period	$50,500	$66,500	$ 94,125	$155,625	$366,750
Total Available Cash	$63,500	$76,500	$104,125	$165,625	$379,750
– Disbursements					
Direct Materials (Cash Payments Schedule)	3,060	5,620	6,560	10,000	25,240
Direct Labor (Direct Labor Budget)	19,500	17,250	27,000	42,000	105,750
Manufacturing Overhead Less Depreciation (MFG OH Budget)	28,925	28,588	30,050	32,300	119,863
Selling and Administrative Expenses Less Depreciation (Sales and Administrative Expense Budget)	18,500	18,500	19,750	22,250	79,000
Income Tax Expense	1,000	1,000	1,000	1,000	4,000
Purchase of Copier (Capital Asset Budget)			8,500		8,500
Total Disbursements	$70,985	$70,958	$ 92,860	$107,550	$342,353
Excess (deficiency) of Available Cash	($ 7,485)	$ 5,542	$ 11,265	$ 58,075	$ 37,397
Financing					
+ Borrowings	17,485	4,458			21,943
– Repayments Including Interest			(1,265)	(21,632)	(22,897)
Ending Cash Balance	$10,000	$10,000	$ 10,000	$ 36,443	$ 36,443

Figure 10.23 Cash Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Budgeted Balance Sheet

The cash budget shows how cash changes from the beginning of the year to the end of the year, and the ending cash balance is the amount shown on the budgeted balance sheet. The budgeted balance sheet is the estimated assets, liabilities, and equities that the company would have at the end of the year if their performance were to meet its expectations. Table 10.1 shows a list of the most common changes to the balance sheet and where the information is derived.

Table 10.1 Common Changes in the Budgeted Balance Sheet By: Rice University OpenStax CC BY-NC-SA 4.0

Information Source	Balance Sheet Change
Cash balance	ending cash balance from the cash budget
Accounts Receivable balance	uncollected receivables from the cash collections schedule
Inventory	ending balance in inventory as shown from calculations to create the income statement
Machinery & Equipment	ending balance in the capital asset budget
Accounts Payable	unpaid purchases from the cash payments schedule

Other balance sheet changes throughout the year are reflected in the income statement and statement of cash flows. For example, the beginning cash balance of Accounts Receivable plus the sales, less the cash collected results in the ending balance of Accounts Receivable. A similar formula is used to compute the ending balance in Accounts Payable. Other budgets and information such as the capital asset budget, depreciation, and financing loans are used as well.

To explain how to use a budgeted balance sheet, let's return to Big Bad Bikes. For simplicity, assume that they did not have accounts receivable or payable at the beginning of the year. They also incurred and paid back their financing during the year, so there is no ending debt. However, the cash budget shows cash inflows and outflows not related to sales or the purchase of materials. The company's capital assets increased by $8,500 from the copier purchase, and their common stock increased by $5,000 from the additional issue as shown in Figure 10.24.

BIG BAD BIKES Budgeted Balance Sheet December 31, 2019		
	Jan. 1	**Dec. 31**
Cash	$13,000	$ 36,443
Accounts Receivable	0	78,250
– Allowance for Doubtful Accounts		(22,000)
Inventory	0	42,629
Machinery and Equipment	15,000	23,500
Accumulated Depreciation	(2,000)	(22,000)
Total Assets	$26,000	$136,822
Accounts Payable	$ 0	$ 6,000
Line of Credit		
Common Stock	15,000	20,000
Retained Earnings	11,000	110,822
Total Liability and Owner's Equity	$26,000	$136,822

Figure 10.24 Budgeted Balance Sheet for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Though there seem to be many budgets, they all fit together like a puzzle to create an overall picture of how a company expects the upcoming business year to look. Figure 10.15 detailed the components of the master budget, and can be used to summarize the budget process. All budgets begin with the sales budget. This budget estimates the number of units that need to be manufactured and precedes the production budget. The production budget (refer to Figure 10.5) provides the necessary information for the budgets needed to plan how many units will be produced. Knowing how many units need to be produced from the production budget, the direct materials budget, direct labor budget, and the manufacturing overhead budget are all prepared. The sales and administrative budget is a nonmanufacturing budget that relies on the sales estimates to pay commissions and other variable expenses. The sales and expenses estimated in all of

these budgets are used to develop a budgeted income statement.

The estimated sales information is used to prepare the cash collections schedule, and the direct materials budget is used to prepare the cash payment schedule. The cash receipts and cash payments budget are combined with the direct labor budget, the manufacturing overhead budget, the sales and administrative budget, and the capital assets budget to develop the cash budget. Finally, all the information is used to flow to the budgeted balance sheet.

YOUR TURN

Creating a Master Budget... order the steps.



An interactive H5P element has been excluded from this version of the text. You can view it online here:
https://psu.pb.unizin.org/acctg211/?p=1413#h5p-11

Long Descriptions

Flow chart of the calculations for budgets. The Master Budget is at the top in purple. From it flow to lines to the Operating budget (all operating budgets are in yellow) and the Financial

budget (all financial budgets are in blue). From the Operating Budget is a line going to the Sales budget (yellow). A green line goes from this Sales Budget to the Collections Budget (blue) to represent cash inflow. The Sales budget also has lines going to the D M, D L, and F O budgets (all yellow) which flow down to the Ending Inventory (yellow) and Payments (blue) Budgets. From the D M, D L, F O, and Ending Inventory Budgets flow lines to the C O G S Budget, which flows to the Income Statement Budget (all yellow). Also from the Sales Budget is a line going to the Selling & A D M Budget (both yellow), which flows to the Payments Budget (blue). From the Sales and Selling and A D M Budgets there are lines going to the Income Statement (all yellow). From the Financial Budget a line goes to the Cash Budget. This has inflow from the Collections Budget (with the green line representing cash inflow) and outflow to the Payments Budget with a red line representing cash outflow). There are also lines from the Cash Budget going to the Capital Budget and the Balance Sheet Budget. All of these mentioned budgets are blue. The Balance sheet also has lines going to it from the Income Statement (yellow) and the Capital Budget (blue). Return

Quarter 4: Beginning balance of Accounts Receivable (Q 3 sales of $112,500 times 35% plus Q 2 sales of 70,000 times 5% plus Q 1 sales of 70,000 times 5%) $46,375 plus Quarter 4 sales 187,500 less Quarter 3 cash receipts (65% of quarter 4 sales equals 121,875 and 30% of quarter 3 sales equals 33,750) 155,625 equals Quarter 4 ending balance in gross accounts receivable 78,250. Return

Percentage of Sales Collected: In quarter 1: 30 percent of prior year quarter 4 sales plus 65 percent of quarter 1 sales. In quarter 2: 30 percent of quarter 1 sales plus 65 percent of quarter 2 sales. In quarter 3: 30 percent of quarter 2 sales plus 65 percent of quarter 3 sales. In quarter 4: 30 percent of quarter 3 sales plus 65 percent of quarter 4 sales. Return

Big Bad Bikes, Cash Collections Schedule For the Year Ending

December 31, 2019 Collections from: prior year Quarter 4 $0 sales, 0 quarter 1, 0 total; Quarter 1 $70,000 sales, $45,500 Q 1, 21,000 Q 2, 66,500 total; Quarter 2 70,000 sales, 45,500 Q 2, 21,000 Q 3, 66,500 total; Quarter 3 112,500 sales, 73,123 Q3, 33,750 Q4, 106,875 total; Quarter 4 187,500 sales, 121,875 Q 4, 121,875 total; Total collections on $440,000 sales, 45,500 Q 1, 66,500 Q 2, 94,125 Q 3, 155,625 Q 4, $361,750 total; Accounts receivable: 440,000 sales minus 361,750 collections equals $78,250. Return

Quarter 4: Beginning balance of Accounts Payable $4,000* plus Quarter 4: Purchase of direct material 12,000 minus Quarter 4: Cash Payments 10,000 equals Quarter 4: Ending balance in Accounts Payable $6,000*; *Big Bad Bikes has a policy of paying 50 percent of purchases in the quarter of purchases, and the remaining 50 percent the month after the purchase. The beginning balance of accounts payable should be 50 percent of the prior quarter's purchases. Return

Big Bad Bikes, Cash Payments Schedule For the Year Ending December 31, 2019. Payments from: prior year Quarter 4 $0 purchases, 0 quarter 1, 0 total; Quarter 1 $6,120 purchases, $3,060 Q 1, 3,060 Q 2, 6,120 total; Quarter 2 5,120 purchases, 2,560 Q 2, 2,560 Q 3, 5,120 total; Quarter 3 8,000 purchases,4,000 Q 3, 4,000 Q 4, 8,000 total; Quarter 4 12,000 purchases, 6,000 Q 4, 6,000 total; Total payments on $31,240 purchases, 3,060 Q 1, 5,620 Q 2, 6,560 Q 3, 10,000 Q 4, $25,240 Total. Return

General Overview of Cash Budget Components* Cash Receipts from Sales plus Other cash receipts (issuance of stock, borrowing money, receiving interest or dividends, from selling assets such as equipment, etc.) minus Cash Payments for Purchases or Production of Inventory minus Cash Payments for manufacturing expenses** minus Cash Payments for selling and administrative expenses ** minus Cash payments for capital asset purchases minus Other cash payments (paying interest, paying loan payments, etc.) equals Net Cash; *This is a general overview of the types of cash transactions that might appear in a cash budget and its representative of the

components but not of a typical presentation of those components; **Note that depreciation, a non-cash expense, would be excluded from these expenses. Return

Big Bad Bikes, Cash Budget, For the Year Ending December 31, 2019, Quarter 1, Quarter 2, Quarter 3, Quarter 4, Total (respectively): Beginning cash balance, $13,000, 10,000, 10,000, 10,000, 13,000; Collections from customers (Cash Collection Schedule) 45,500, 66,500, 94,125, 155,625, 361,750; Issuing of stock 5,000 –, –, –, 5,000; Total cash collected during the period 50,500, 66,500, 94,125, 155,625, 366,750; Total available cash 63,500, 76,500, 104,125, 165,625, 379,750; Less disbursements: Direct materials (cash payment schedule) 3,060, 5,620, 6,560, 10,000, 25,240; Direct labor (direct labor budget) 19,500, 17,250, 27,000, 42,000, 105,750; Manufacturing overhead less depreciation (MFG OH Budget) 28,925, 28,588, 30,050, 32,300, 119,863; Selling and Administrative expenses less depreciation (Sales and Admin. Expenses Budget) 18,500, 18,500, 19,750, 22,250, 79,000; Income tax expense 1,000, 1,000, 1,000, 1,000, 4,000; Purchase of copier (Capital Assets Budget) –, –, 8,500, –, 8,500; Total disbursements 70,985, 70,958, 90,860, 107,550, 342,353; Excess (deficiency) of available cash (7,485), 5,542, 11,265, 58,075, 37,397; Financing: Add borrowing 17,485, 4,458, –, –, 21,943; Less repayments including interest –, –, (1,265), (21,632), (22,897).Ending cash balance, 10,000, 10,000, 10,000, 36,443, 36,443. Return

Big Bad Bikes, Budgeted Balance Sheet, December 31, 2019 Jan 1 and Dec. 31, respectively: Cash 13,000, 36,443; Accounts Receivable 0, 78250; Less allowance for doubtful accounts 0, (22,000); Inventory 0, 42,629; Machinery and equipment 15,000, 23,500; Accumulated Depreciation (2,000), (22,000); Total assets $26,000, $136,822; Accounts Payable 0, 6,000; Line of credit 0, 0; Common Stock 15,000, 20,000; Retained Earnings 11,000, 110, 822; Total Liabilities and Owner's Equity $26,000, $136,822. Return

10.4 Flexible Budgets

A company makes a budget for the smallest time period possible so that management can find and adjust problems to minimize their impact on the business. Everything starts with the estimated sales, but what happens if the sales are more or less than expected? How does this affect the budget? What adjustments does a company have to make in order to compare the actual numbers to budgeted numbers when evaluating results? If production is higher than planned and has been increased to meet the increased sales, expenses will be over budget. But is this bad? To account for actual sales and expenses differing from budgeted sales and expenses, companies will often create flexible budgets to allow budgets to fluctuate with future demand.

Flexible Budgets

A flexible budget is one based on different volumes of sales. A flexible budget flexes the static budget for each anticipated level of production. This flexibility allows management to estimate what the budgeted numbers would look like at various levels of sales. Flexible budgets are prepared at each analysis period (usually monthly), rather than in advance, since the idea is to compare the operating income to the expenses deemed appropriate at the actual production level.

Big Bad Bikes is planning to use a flexible budget when they begin making trainers. The company knows its variable costs per unit and knows it is introducing its new product to the marketplace. Its estimations of sales and sales price will likely change as the product takes hold and customers purchase it. Big Bad Bikes developed a flexible budget that shows the

change in income and expenses as the number of units changes. It also looked at the effect a change in price would have if the number of units remained the same. The expenses that do not change are the fixed expenses, as shown in Figure 10.25.

BIG BAD BIKES Flexible Budget For Year Ended December 31, 2019				
Units Sold		1,000	1,500	1,500
Sales Price		$ 70	$ 70	$ 75
Sales		$70,000	$105,000	$112,500
	Per-unit cost			
Cost of Goods Sold				
Direct Material	$ 4	$ 4,000	$ 6,000	$ 6,000
Direct Labor	15	15,000	22,500	22,500
Variable Manufacturing Overhead	3	3,000	4,500	4,500
Fixed Manufacturing Overhead		29,000	29,000	29,000
Total Cost of Goods Sold		51,000	62,000	62,000
Gross Profit		19,000	43,000	50,500
Variable Sales and Admin	2.50	2,500	3,750	3,750
Fixed Sales and Admin		18,000	18,000	18,000
Income Taxes		1,000	1,000	1,000
Total Other Expenses		21,500	22,750	22,750
Net Income (Loss)		(2,500)	20,250	27,750

Figure 10.25 Flexible Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Static versus Flexible Budgets

A static budget is one that is prepared based on a single level of output for a given period. The master budget, and all the budgets included in the master budget, are examples of static budgets. Actual results are compared to the static budget numbers as one means to evaluate company performance. However, this comparison may be like comparing apples to oranges because variable costs should follow production, which should follow sales. Thus, if sales differ from what is budgeted, then comparing actual costs to budgeted costs may not provide a clear indicator of how well the company is

meeting its targets. A flexible budget created each period allows for a comparison of apples to apples because it will calculate budgeted costs based on the actual sales activity.

For example, Figure 10.26 shows a static quarterly budget for 1,500 trainers sold by Big Bad Bikes. The budget will change if there are more or fewer units sold.

BIG BAD BIKES Static Quarterly Budget For Each Quarter	
Units Sold	1,500
Sales Price	$ 70
Sales	105,000
Cost of Goods Sold	
Direct Material	6,000
Direct Labor	22,500
Variable Manufacturing Overhead	4,500
Fixed Manufacturing Overhead	29,000
Total Cost of Goods Sold	$ 62,000
Gross Profit	$ 43,000
Variable Sales and Admin	3,750
Fixed Sales and Admin	18,000
Interest Expense	0
Income Taxes	1,000
Total Other Expenses	$ 22,750
Net Income (Loss)	$ 20,250

Figure 10.26 Static Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Budget with Varying Levels of Production

Companies develop a budget based on their expectations for

their most likely level of sales and expenses. Often, a company can expect that their production and sales volume will vary from budget period to budget period. They can use their various expected levels of production to create a flexible budget that includes these different levels of production. Then, they can modify the flexible budget when they have their actual production volume and compare it to the flexible budget for the same production volume. A flexible budget is more complicated, requires a solid understanding of a company's fixed and variable expenses, and allows for greater control over changes that occur throughout the year. For example, suppose a proposed sale of items does not occur because the expected client opted to go with another supplier. In a static budget situation, this would result in large variances in many accounts due to the static budget being set based on sales that included the potential large client. A flexible budget on the other hand would allow management to adjust their expectations in the budget for both changes in costs and revenue that would occur from the loss of the potential client. The changes made in the flexible budget would then be compared to what actually occurs to result in more realistic and representative variance. This ability to change the budget also makes it easier to pinpoint who is responsible if a revenue or cost target is missed.

Big Bad Bikes used the flexible budget concept to develop a budget based on its expectation that production levels will vary by quarter. By the fourth quarter, sales are expected to be strong enough to pay back the financing from earlier in the year. The budget shown in Figure 10.27 illustrates the payment of interest and contains information helpful to management when determining which items should be produced if production capacity is limited.

BIG BAD BIKES Varying Production Budget Flexible Budget					
		Quarter 1	Quarter 2	Quarter 3	Quarter 4
Units Sold		1,000	1,000	1,500	2,500
Sales Price		$ 70	$ 70	$ 75	$ 75
Sales		70,000	70,000	112,500	187,500
	Per-unit cost				
Cost of Goods Sold					
Direct Material	$ 4	$ 4,000	$ 4,000	$ 6,000	$ 10,000
Direct Labor	15	15,000	15,000	22,500	37,500
Variable Manufacturing Overhead	3	3,000	3,000	4,500	7,500
Fixed Manufacturing Overhead		29,000	29,000	29,000	29,000
Total Cost of Goods Sold		51,000	51,000	62,000	84,000
Gross Profit		19,000	19,000	50,500	103,500
Variable Sales and Admin	2.50	2,500	2,500	3,750	6,250
Fixed Sales and Admin		18,000	18,000	18,000	18,000
Interest Expense					1,653
Income Taxes		1000	1000	1000	1000
Total Other Expenses		21,500	21,500	22,750	26,903
Net Income (Loss)		(2,500)	(2,500)	27,750	76,597

Figure 10.27 Varying Production Levels for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

CONCEPTS IN PRACTICE

Flexible Budgets and Sustainability

The ability to provide flexible budgets can be critical in new or changing businesses where the accuracy of estimating sales or usage my not be strong. For example, organizations are often reporting their sustainability efforts and may have some products that require more electricity than other products. The reporting of the energy per unit of output has sometimes been in error and can mislead management into making changes that may or may not help the company. For example, based on the energy per unit reported, management may decide to

change the product mix, the amount that is outsourced, and/or the amount that is produced.[1] If the energy output isn't correct, the decisions may be wrong and create an adverse impact on the budget.

Long Descriptions

A flexible budget for Big Bad Bikes presents three budget scenarios for different quantities of units sold and different sale prices. Per-unit costs are identified: direct material $4, direct labor $15, variable manufacturing overhead $3, and variable sales and admin $3. In the first scenario, 1,000 units are sold at a sales price of $70 for total sales income of $70,000. Budget items for the first scenario are: direct material $4,000, direct labor $15,000, variable manufacturing overhead $3,000, fixed manufacturing overhead $29,000, total cost of goods sold $51,000, gross profit $19,000, variable sales and admin $2,500, fixed sales and admin $18,000, income taxes $1,000, total other expenses $21,500, resulting in a net loss of $2,500. In the second scenario, 1,500 units are sold at a sales price of $70 for total sales income of $105,000. Budget items for the second scenario are: direct material $6,000, direct labor $22,500, variable manufacturing overhead $4,500, fixed manufacturing overhead $29,000, total cost of goods sold $62,000, gross profit $43,000, variable sales and admin $3,750, fixed sales and admin $18,000, income taxes $1,000, total other expenses $22,750, resulting in a net income gain of $20,250. In the third scenario, 1,500 units are sold at a sales price of $75 for total sales income of $112,500. Budget items for the third scenario are: direct material $6,000, direct labor $22,500, variable manufacturing overhead $4,500, fixed manufacturing overhead $29,000, total cost of goods sold $62,000, gross profit $50,500, variable sales and admin $3,750, fixed sales and admin $18,000, income taxes

$1,000, total other expenses $22,750, resulting in a net income gain of $27,750. Return

Big Bad Bikes, Static Quarterly Budget for Each Quarter: Units sold 1,500 times Sales price $70 equals Sales $105,000. Budget items are: Direct material $6,000, Direct labor $22,500, Variable manufacturing overhead $4,500, Fixed manufacturing overhead $29,000, Total cost of goods sold $62,000, gross profit $43,000, variable sales and admin $3,750, fixed sales and admin $18,000, no interest expense, income taxes $1,000, total other expenses $22,750, net income $20,250. Return

A varying production budget for Big Bad Bikes presents budget items for four quarters. Per-unit costs are identified: direct material $4, direct labor $15, variable manufacturing overhead $3, and variable sales and admin $3. In the first quarter, 1,000 units are sold at a sales price of $70 for total sales income of $70,000. Budget items for the first quarter are: direct material $4,000, direct labor $15,000, variable manufacturing overhead $3,000, fixed manufacturing overhead $29,000, total cost of goods sold $51,000, gross profit $19,000, variable sales and admin $2,500, fixed sales and admin $18,000, income taxes $1,000, total other expenses $21,500, resulting in a net loss of $2,500. The second quarter is identical to the first quarter. In the third quarter, 1,500 units are sold for a sales price of $75 for total sales income of $112,500. Budget items for the third quarter are: direct material $6,000, direct labor $22,500, variable manufacturing overhead $4,500, fixed manufacturing overhead $29,000, total cost of goods sold $62,000, gross profit $50,500, variable sales and admin $3,750, fixed sales and admin $18,000, income taxes $1,000, total other expenses $22,750, resulting in a net income gain of $27,750. In the fourth quarter, 2,500 units are sold for a sales price of $75 for total sales income of $187,500. Budget items for the fourth quarter are: direct material $10,000, direct labor $37,500, variable manufacturing overhead $7,500, fixed manufacturing overhead $29,000, total cost of goods sold $84,000, gross profit $103,500, variable sales

and admin $6,250, fixed sales and admin $18,000, income taxes $1,653, total other expenses $26,903, resulting in a net income gain of $76,597. Return

Footnotes

- 1 Jon Bartley, et al. “Using Flexible Budgeting to Improve Sustainability Measures.: *American Institute of CPAs*. Jan. 23, 2017. https://www.aicpa.org/interestareas/businessindustryandgovernment/resources/sustainability/improvesustainabilitymeasures.html

Variances

10.5 Fundamentals of Standard Costs

A syllabus is one way an instructor can communicate expectations to students. Students can use the syllabus to plan their studying to maximize their grade and to coordinate the amount and timing of studying for each course. Knowing what is expected, and when it is expected, allows for better plans and performance. When your performance does not match your expectations, a variance arises—a difference between the standard and the actual performance. You then need to determine why the difference occurred. You want to know why you did not receive the grade you expected so you can make adjustments for the next assignment to earn a better grade.

Companies operate in a similar manner. They have an expectation, or standard, for production. For example, if a company is producing tables, it might establish standards for such components as the amount of board feet of lumber expected to be used in producing each table or the number of hours of direct labor hours it expected to use in the table's production. These standards can then be used in establishing standard costs that can be used in creating an assortment of different types of budgets.

When a variance occurs in its standards, the company investigates to determine the causes, so they can perform better in the future. For example, **General Motors** has standards for each item on a vehicle. It can determine the cost and selling price of a power antenna by knowing the standard material cost for the antenna and the standard labor cost of adding the antenna to the vehicle. **General Motors** also can add up all of the standard times for all vehicles it makes to

determine if too much or too little labor was used in production.

Fundamentals of Standard Costs

It is important to establish standards for cost at the beginning of a period to prepare the budget; manage material, labor, and overhead costs; and create a reasonable sales price for a good. A standard cost is an expected cost that a company usually establishes at the beginning of a fiscal year for prices paid and amounts used. The standard cost is an expected amount paid for materials costs or labor rates. The standard quantity is the expected usage amount of materials or labor. A standard cost may be determined by past history or industry norms. The company can then compare the standard costs against its actual results to measure its efficiency. Sometimes when comparing standard costs against actual results, there is a difference.

This difference can be attributed to many reasons. For example, the coffee company mentioned in the opening vignette may expect to pay $0.50 per ounce for coffee grounds. After the company purchased the coffee grounds, it discovered it paid $0.60 per ounce. This variance would need to be accounted for, and possible operational changes would occur as a result. Cost accounting systems become more useful to management when they include budgeted amounts to serve as a point of comparison with actual results.

Many departments help determine standard cost. Product design, in conjunction with production, purchasing, and sales, determines what the product will look like and what materials will be used. Production works with purchasing to determine what material will work best in production and will be the most cost efficient. Sales will also help decide the material in terms of customer demand. Production will work with personnel to

determine labor costs for the product, which is based on how long it will take to make the product, which departments will be involved, and what type and number of employees it will take.

Consider how many different materials can go into a product. For example, there are approximately 14,000 parts that comprise the average automobile. The manufacturer will set a standard price and a quantity used per automobile for each part, and it will determine the labor required to install the part. At **Fiat Chrysler Automobiles**' Belvidere Assembly Plant, for example, there are approximately 5,000 employees assembling automobiles.[2] In addition to having standard costs associated with each part, each employee has standards for the job he or she performs.

Standard costs are typically established for reasonably attainable levels of efficiency (production). They serve as a target and are useful in motivating standard performance. An ideal standard level is set assuming that everything is perfect, machines do not break down, employees show up on time, there are no defects, there is no scrap, and materials are perfect. This level of standard is not the best motivator, because employees may see this level as unattainable. For example, consider whether you would take a course if the letter grades were as follows: an A is 99–100%, a B is 98–99%, a C is 97–98%, a D is 96–97%, and below 96% is an F. These standards are unreasonable and unrealistic, and they would not motivate students to do well in the course.

At the other end of the spectrum, if the standards are too easy, there is little motivation to do better, and products may not be properly built, may be built with inferior materials, or both. For example, consider how you would handle the following grading scale for your course: an A is 50–100%, a B is 35–50%, a C is 10–35%, a D is 2–10%, and below 2% is an F. Would you learn anything? Would you try very hard? The same

considerations come into play for employees with standards that are too easy.

Instead of these two extremes, a company would set an attainable standard, which is one that employees can reach with reasonable effort. The standards are not so high that employees will not try to reach them and not so low that they do not give any incentive for employees to achieve profitability.

In order for a company to establish its attainable standard cost for each product, it must consider the standard costs for materials, labor, and overhead. The material standard cost consists of a standard price per unit of material and a standard amount of material per unit. Returning to the opening vignette, let us say the coffee shop is trying to establish the standard materials cost for one cup of regular coffee. To keep the example simple, we are not incorporating the cost of water or the ceramic cup cost (since they are reused). Two components for the cup of coffee will need to be considered:

1. Price per ounce of coffee grounds
2. Amount of coffee grounds (materials) used per cup of coffee

To determine the standards for labor, the coffee shop would need to consider two additional components:

1. Labor rate per minute
2. Amount of time to make one cup of regular coffee

To determine the standard for overhead, the coffee shop would first need to consider the fact that it has two types of overhead as shown in Figure 10.28.

1. Fixed overhead (does not change in total with production)
2. Variable overhead (does change in total with production)

All of this information is entered on a standard cost card.

STANDARD COST CARD Product: 1 Cup of Coffee				
Manufacturing Cost Information	Standard Quantity	×	Standard Cost per Unit	= Cost Summary
Direct Materials				
Material (coffee grounds)	0.5 ounces		$.50 per ounce	$0.25
Direct Labor				
Barista	1 minute		$0.20 per minute	$0.20
Manufacturing Overhead				
Variable overhead	1 minute		$0.05 per direct labor minute	$0.05
Fixed overhead	1 minute		$0.10 per direct labor minute	$0.10
Standard Cost per cup of coffee				**$0.60**

Figure 10.28 Standard Cost Card for a Coffee Shop *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

Once a company determines a standard cost, they can then evaluate any variances. A variance is the difference between a standard cost and actual performance. There are favorable and unfavorable variances. A favorable variance involves spending less, or using less, than the anticipated or estimated standard. An unfavorable variance involves spending more, or using more, than the anticipated or estimated standard. Before determining whether the variance is favorable or unfavorable, it is often helpful for the company to determine why the variance exists.

YOUR TURN

Developing a Standard Cost Card

Use the information provided to create a standard cost card for production of one deluxe bicycle from Bicycles Unlimited.

To make one bicycle it takes four pounds of material. The material can usually be purchased for $5.25 per pound. The

labor necessary to build a bicycle consists of two types. The first type of labor is assembly, which takes 2.75 hours. These workers are paid $11.00 per hour. The second type of labor is finishing, which takes 4 hours. These workers are paid $15.00 per hour. Overhead is applied using labor hours. The variable overhead rate is $5.00 per labor hour. The fixed overhead rate is $3.00 per hour.

Solution

Manufacturing Cost Information	Standard Quantity	×	Standard Cost per Unit	=	Cost Summary
Direct Materials					
Grade A material	4 pounds		$5.25 per pound		$21.00
Direct Labor					
Assembly	2.75 hours		$11.00 per hour		$30.25
Finish	4 hours		$15.00 per hour		$60.00
Manufacturing Overhead					
Variable overhead	6.75 hours		$5.00 per direct labor hour		$33.75
Fixed overhead	6.75 hours		$3.00 per direct labor hour		$20.25
Standard Cost					$165.25

Figure 10.29 *By: Rice University Openstax CC BY NC SA Long Description*

Different factors may produce a variance. The company could have paid too much or too little for production. It may have purchased the wrong grade of material or hired employees with more or less experience than required. Sometimes the variances are interrelated. For example, purchasing substandard materials may lead to using more time to make the product and may produce more scrap. The substandard material may have been more difficult to work with or had more defects than the proper grade material. In such a situation, a favorable material price variance could cause an unfavorable labor efficiency variance and an unfavorable material quantity variance. Employees who do not have the expected experience level may save money in the wage rate

but may require more hours to be worked and more material to be used because of their inexperience.

Another situation in which a variance may occur is when the cost of labor and/or material changes after the standard was established. Toward the end of the fiscal year, standards often become less reliable because time has passed and the environment has changed. It is not reasonable to expect the price of all materials and labor to remain constant for 12 months. For example, the grade of material used to establish the standard may no longer be available.

Manufacturing Cost Variances

As you've learned, the standard price and standard quantity are anticipated amounts. Any change from these budgeted amounts will produce a variance. There can be variances for materials, labor, and overhead. Direct materials may have a variance in price of materials or quantity of materials used. Direct labor may have a variance in the rate paid to workers or the amount of time used to make a product. Overhead may produce a variance in expected fixed or variable costs, leading to possible differences in production capacity and management's ability to control overhead. More specifics on the formulas, processes, and interpretations of the direct materials, direct labor, and overhead variances are discussed in each of this chapter's following sections.

CONCEPTS IN PRACTICE

Qualcomm[3]

Qualcomm Inc. is a large producer of telecommunications equipment focusing mainly on wireless products and services. As with any company, Qualcomm sets labor standards and must address any variances in labor costs to stay on budget, and control overall manufacturing costs.

In 2018, Qualcomm announced a reduction to its labor force, affecting many of its full-time and temporary workers. The reduction in labor was necessary to suppress rising expenses that could not be controlled through overhead or materials cost-cutting measures. The variances between standard labor rates and actual labor rates, and diminishing profit margins will have contributed to this decision. It is important for Qualcomm management to keep labor variances minimal in the future so that large workforce reductions are not required to control costs.

Long Description

Standard Cost Card. Product: 1 Cup of Coffee. Manufacturing Cost Information, Standards. Quantity x Standard Cost per Unit equals Cost Summary. Direct Materials (Coffee grounds), .5 ounces, $0.50 per ounce, $0.25. Direct Labor Barista, 1 minute, $0.20 per minute, $0.20. Manufacturing Overhead Variable, 1 minute, $0.50 per direct labor minute, $0.05. Manufacturing Overhead Fixed, 1 minute, $0.10 per direct labr minute, $0.10. Total, -, -, $0.60 Return

Manufacturing Cost Information: Standard Quantity times Standard Cost per Unit equals Cost Summary. Direct Materials

Grade A material, 4 pounds, $5.25 per pound, $21.00. Direct Labor Assembly, 2.75 hours, $11.00 per hour, $30.25. Direct Labor Finish, 4 hours, $15.00 per hour, $60.00. Manufacturing Overhead Variable, 6.75 hours, $5.00 per direct labor hour, $33.75. Manufacturing Overhead Fixed, 6.75 hours, $3.00 per direct labor hour, $20.25. Standard Cost, -, -, $165.25. Return

Footnotes

- 2 "Belvidere Assembly Plant and Belvidere Satellite Stamping Plant." Fiat Chrysler Automobiles. June 2018. http://media.fcanorthamerica.com/newsrelease.do?id=323&mid=1
- 3 Munsif Vengattil. "Qualcomm Begins Layoffs as Part of Cost Cuts." *Reuters*. April 18, 2018. https://www.reuters.com/article/us-qualcomm-layoffs/qualcomm-begins-layoffs-as-part-of-cost-cuts-idUSKBN1HP33L

10.6 Direct Materials Variances

As you've learned, direct materials are those materials used in the production of goods that are easily traceable and are a major component of the product. The amount of materials used and the price paid for those materials may differ from the standard costs determined at the beginning of a period. A company can compute these materials variances and, from these calculations, can interpret the results and decide how to address these differences.

CONCEPTS IN PRACTICE

Buttering Popcorn

In a movie theater, management uses standards to determine if the proper amount of butter is being used on the popcorn. They train the employees to put two tablespoons of butter on each bag of popcorn, so total butter usage is based on the number of bags of popcorn sold. Therefore, if the theater sells 300 bags of popcorn with two tablespoons of butter on each, the total amount of butter that should be used is 600 tablespoons. Management can then compare the predicted use of 600 tablespoons of butter to the actual amount used. If the actual usage of butter was less than 600, customers may not be happy, because they may feel that they did not get enough butter. If more than 600 tablespoons of butter were used, management would investigate to determine why. Some

reasons why more butter was used than expected (unfavorable outcome) would be because of inexperienced workers pouring too much, or the standard was set too low, producing unrealistic expectations that do not satisfy customers.

Fundamentals of Direct Materials Variances

The direct materials variances measure how efficient the company is at using materials as well as how effective it is at using materials. There are two components to a direct materials variance, the direct materials price variance and the direct materials quantity variance, which both compare the actual price or amount used to the standard amount.

Direct Materials Price Variance

The direct materials price variance compares the actual price per unit (pound or yard, for example) of the direct materials to the standard price per unit of direct materials. The formula for direct materials price variance is calculated as:

$$\text{Direct Materials Price Variance} = \left(\begin{array}{c}\text{Actual Quantity Used} \\ \times \\ \text{Actual Price Paid}\end{array}\right) - \left(\begin{array}{c}\text{Actual Quantity Used} \\ \times \\ \text{Standard Price}\end{array}\right)$$

Figure 10.30 *By: Rice University Openstax CC BY NC SA 4.0*

Factoring out actual quantity used from both components of the formula, it can be rewritten as:

$$\text{Direct Materials Price Variance} = \left(\text{Actual Price per Unit of Materials} - \text{Standard Price per Unit of Materials}\right) \times \text{Actual Quantity of Materials Used}$$

Figure 10.31 *By: Rice University Openstax CC BY NC SA 4.0*

With either of these formulas, the actual quantity used refers to the actual amount of materials used to create one unit of product. The standard price is the expected price paid for materials per unit. The actual price paid is the actual amount paid for materials per unit. If there is no difference between the standard price and the actual price paid, the outcome will be zero, and no price variance exists.

If the actual price paid per unit of material is lower than the standard price per unit, the variance will be a favorable variance. A favorable outcome means you spent less on the purchase of materials than you anticipated. If, however, the actual price paid per unit of material is greater than the standard price per unit, the variance will be unfavorable. An unfavorable outcome means you spent more on the purchase of materials than you anticipated.

The actual price can differ from the standard or expected price because of such factors as supply and demand of the material, increased labor costs to the supplier that are passed along to the customer, or improvements in technology that make the material cheaper. The producer must be aware that the difference between what it expects to happen and what actually happens will affect all of the goods produced using these particular materials. Therefore, the sooner management is aware of a problem, the sooner they can fix it. For that reason, the material price variance is computed at the time of purchase and not when the material is used in production.

Let us consider an example. Connie's Candy Company produces various types of candies that they sell to retailers. Connie's Candy establishes a standard price for candy-making

materials of $7.00 per pound. Each box of candy is expected to use 0.25 pounds of candy-making materials. Connie's Candy found that the actual price of materials was $6.00 per pound. They still actually use 0.25 pounds of materials to make each box. The direct materials price variance computes as:

In this case, the actual price per unit of materials is $6.00, the standard price per unit of materials is $7.00, and the actual quantity used is 0.25 pounds. This computes as a favorable outcome. This is a favorable outcome because the actual price for materials was less than the standard price. As a result of this favorable outcome information, the company may consider continuing operations as they exist, or could change future budget projections to reflect higher profit margins, among other things.

Let us take the same example except now the actual price for candy-making materials is $9.00 per pound. The direct materials price variance computes as:

In this case, the actual price per unit of materials is $9.00, the standard price per unit of materials is $7.00, and the actual quantity used is 0.25 pounds. This computes as an unfavorable outcome. This is an unfavorable outcome because the actual price for materials was more than the standard price. As a result of this unfavorable outcome information, the company may consider using cheaper materials, changing suppliers, or increasing prices to cover costs.

Another element this company and others must consider is a direct materials quantity variance.

Direct Materials Quantity Variance

The direct materials quantity variance compares the actual quantity of materials used to the standard materials that were expected to be used to make the actual units produced. The variance is calculated using this formula:

$$\text{Direct Materials Quantity Variance} = \left(\begin{array}{c}\text{Actual Quantity Used}\\ \times \\ \text{Standard Price}\end{array}\right) - \left(\begin{array}{c}\text{Standard Quantity}\\ \times \\ \text{Standard Price}\end{array}\right)$$

Figure 10.32 *By: Rice University Openstax CC BY NC SA 4.0*

Factoring out standard price from both components of the formula, it can be rewritten as:

$$\text{Direct Materials Quantity Variance} = \left(\begin{array}{c}\text{Actual Quantity of}\\ \text{Materials Used}\\ \text{for Units Produced}\end{array} - \begin{array}{c}\text{Standard Quantity}\\ \text{of Materials Expected}\\ \text{for the Units Produced}\end{array}\right) \times \text{Standard Price}$$

Figure 10.33 *By: Rice University Openstax CC BY NC SA 4.0*

With either of these formulas, the actual quantity used refers to the actual amount of materials used at the actual production output. The standard price is the expected price paid for materials per unit. The standard quantity is the expected amount of materials used at the actual production output. If there is no difference between the actual quantity used and the standard quantity, the outcome will be zero, and no variance exists.

If the actual quantity of materials used is less than the standard quantity used at the actual production output level, the variance will be a favorable variance. A favorable outcome means you used fewer materials than anticipated, to make the actual number of production units. If, however, the actual

quantity of materials used is greater than the standard quantity used at the actual production output level, the variance will be unfavorable. An unfavorable outcome means you used more materials than anticipated to make the actual number of production units.

The actual quantity used can differ from the standard quantity because of improved efficiencies in production, carelessness or inefficiencies in production, or poor estimation when creating the standard usage.

Consider the previous example with Connie's Candy Company. Connie's Candy established a standard price for candy-making materials of $7.00 per pound. Each box of candy is expected to use 0.25 pounds of candy-making materials. Connie's Candy found that the actual quantity of candy-making materials used to produce one box of candy was 0.20 per pound. The direct materials quantity variance computes as:

In this case, the actual quantity of materials used is 0.20 pounds, the standard price per unit of materials is $7.00, and the standard quantity used is 0.25 pounds. This computes as a favorable outcome. This is a favorable outcome because the actual quantity of materials used was less than the standard quantity expected at the actual production output level. As a result of this favorable outcome information, the company may consider continuing operations as they exist, or could change future budget projections to reflect higher profit margins, among other things.

Let us take the same example except now the actual quantity of candy-making materials used to produce one box of candy was 0.50 per pound. The direct materials quantity variance computes as:

In this case, the actual quantity of materials used is 0.50 pounds, the standard price per unit of materials is $7.00, and

the standard quantity used is 0.25 pounds. This computes as an unfavorable outcome. This is an unfavorable outcome because the actual quantity of materials used was more than the standard quantity expected at the actual production output level. As a result of this unfavorable outcome information, the company may consider retraining workers to reduce waste or change their production process to decrease materials needs per box.

The combination of the two variances can produce one overall total direct materials cost variance.

Total Direct Materials Cost Variance

When a company makes a product and compares the actual materials cost to the standard materials cost, the result is the total direct materials cost variance.

$$\text{Total Direct Materials Variance} = \left(\begin{matrix}\text{Actual Quantity} \\ \times \\ \text{Actual Price}\end{matrix}\right) - \left(\begin{matrix}\text{Standard Quantity} \\ \times \\ \text{Standard Price}\end{matrix}\right)$$

Figure 10.34 *By: Rice University Openstax CC BY NC SA 4.0*

An unfavorable outcome means the actual costs related to materials were more than the expected (standard) costs. If the outcome is a favorable outcome, this means the actual costs related to materials are less than the expected (standard) costs.

The total direct materials cost variance is also found by combining the direct materials price variance and the direct materials quantity variance. By showing the total materials variance as the sum of the two components, management can better analyze the two variances and enhance decision-making.

Figure 10.35 shows the connection between the direct materials price variance and direct materials quantity variance to total direct materials cost variance.

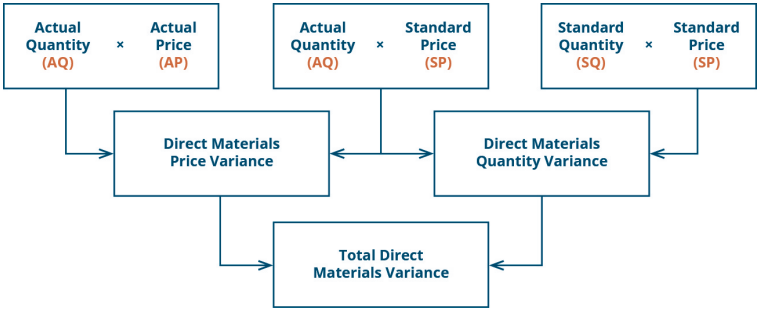


Figure 10.35 Direct Materials Variance *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

For example, Connie's Candy Company expects to pay $7.00 per pound for candy-making materials but actually pays $9.00 per pound. The company expected to use 0.25 pounds of materials per box but actually used 0.50 per box. The total direct materials variance is computed as:

In this case, two elements contribute to the unfavorable outcome. Connie's Candy paid $2.00 per pound more for materials than expected and used 0.25 pounds more of materials than expected to make one box of candy.

The same calculation is shown using the outcomes of the direct materials price and quantity variances.

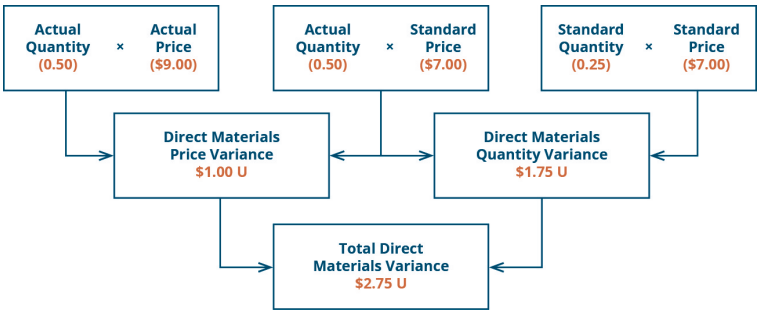


Figure 10.36 *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

As with the interpretations for the materials price and quantity variances, the company would review the individual components contributing to the overall unfavorable outcome for the total direct materials variance, and possibly make changes to production elements as a result.

YOUR TURN

Sweet and Fresh Shampoo Materials

Biglow Company makes a hair shampoo called Sweet and Fresh. Each bottle has a standard material cost of 8 ounces at $0.85 per ounce. During May, Biglow manufactured 11,000 bottles. They bought 89,000 ounces of material at a cost of $74,760. All 89,000 ounces were used to make the 11,000 bottles. Calculate the material price variance and the material quantity variance.

Solution

Actual price per pound: 74,760 ÷ 89,000 = $0.84

Material price variance: 89,000 × (0.84 − 0.85) = $890 favorable

Material quantity variance: 0.85 × (89,000 − 88,000) = $850 unfavorable

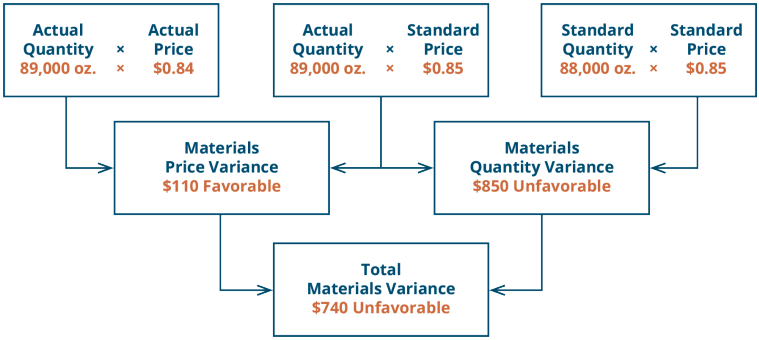


Figure 10.37 *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

Long Description

There are three top row boxes. Two, Actual Quantity (AQ) times Actual Price (AP) and Actual Quantity (AQ) times Standard Price (SP) combine to point to a Second row box: Direct Material Price Variance. Two top row boxes: Actual Quantity (AQ) times Standard Price (SP) and Standard Quantity (SQ) times Standard Price (SP) combine to point to Second row box: Direct Materials Quantity Variance. Notice the middle top row box is used for both of the variances. Second row boxes: Direct Material Price Variance and Direct Materials Quantity Variance combine to point to bottom row box: Total Direct Material Variance. Return

There are three top row boxes. Top row boxes: Actual Quantity (0.50) times Actual Price ($9.00) and Actual Quantity (0.50) times Standard Price ($7.00) combine to point to Second row box: Direct Material Price Variance $1.00 U. Top row boxes: Actual Quantity (.50) times Standard Price ($7.00) and Standard

Quantity (0.25) times Standard Price ($7.00) combine to point to Second row box: Direct Materials Quantity Variance $1.75 U. Notice the middle top row box was used for both variances. The two second row boxes: Direct Material Price Variance $1.00 U and Direct Materials Quantity Variance $1.75 U combine to point to the one bottom row box: Total Direct Material Variance $2.75 U. Return

There are three top row boxes. Top row boxes: Actual Quantity (89,000 ounces) times Actual Price ($0.84) and Actual Quantity (89,000 ounces) times Standard Price ($0.85) combine to point to Second row box: Direct Material Price Variance $890 Favorable. Top row boxes: Actual Quantity (89,000 ounces) times Standard Price ($0.85) and Standard Quantity (88,000 ounces) times Standard Price ($0.85) combine to point to Second row box: Direct Materials Quantity Variance $850 Unfavorable. Notice the middle top row box was used for both variances. The two second row boxes: Direct Material Price Variance $890 Favorable and Direct Materials Quantity Variance $850 Unfavorable combine to point to the one bottom row box: Total Direct Material Variance $40 Favorable. Return

10.7 Direct Labor Variances

In addition to evaluating materials usage, companies must assess how efficiently and effectively they are using labor in the production of their products. Direct labor is a cost associated with workers working directly in the production process. The company must look at both the quantity of hours used and the rate of the labor and compare outcomes to standard costs. Determining efficiency and effectiveness of labor leads to individual labor variances. A company can compute these labor variances and make informed decisions about labor operations based on these differences.

Fundamentals of Direct Labor Variances

The direct labor variance measures how efficiently the company uses labor as well as how effective it is at pricing labor. There are two components to a labor variance, the direct labor rate variance and the direct labor time variance.

Direct Labor Rate Variance

The direct labor rate variance compares the actual rate per hour of direct labor to the standard rate per hour of labor for the hours worked. The direct labor rate variance is calculated using this formula:

$$\text{Direct Labor Rate Variance} = \left(\begin{matrix}\text{Actual Hours Worked} \\ \times \\ \text{Actual Rate per Hour}\end{matrix}\right) - \left(\begin{matrix}\text{Actual Hours Worked} \\ \times \\ \text{Standard Rate per Hour}\end{matrix}\right)$$

Figure 10.38 *By: Rice University OpenStax CC BY-NC-SA 4.0*

Factoring out the actual hours worked from both components of the formula, it can be rewritten as

$$\text{Direct Labor Rate Variance} = \left(\begin{matrix}\text{Actual Rate} \\ \text{per Hour}\end{matrix} - \begin{matrix}\text{Standard Rate} \\ \text{per Hour}\end{matrix}\right) \times \begin{matrix}\text{Actual Hours} \\ \text{Worked}\end{matrix}$$

Figure 10.39 *By: Rice University OpenStax CC BY-NC-SA 4.0*

With either of these formulas, the actual rate per hour refers to the actual rate of pay for workers to create one unit of product. The standard rate per hour is the expected rate of pay for workers to create one unit of product. The actual hours worked are the actual number of hours worked to create one unit of product. If there is no difference between the standard rate and the actual rate, the outcome will be zero, and no variance exists.

If the actual rate of pay per hour is less than the standard rate of pay per hour, the variance will be a favorable variance. A favorable outcome means you paid workers less than anticipated. If, however, the actual rate of pay per hour is greater than the standard rate of pay per hour, the variance will be unfavorable. An unfavorable outcome means you paid workers more than anticipated.

The actual rate can differ from the standard or expected rate because of supply and demand of the workers, increased labor costs due to economic changes or union contracts, or the ability to hire employees at a different skill level. Once the manufacturer makes the products, the labor costs will follow the goods through production, so the company should

evaluate how the difference between what it expected to happen and what actually happened will affect all the goods produced using these particular labor rates.

Let us again consider Connie's Candy Company with respect to labor. Connie's Candy establishes a standard rate per hour for labor of $8.00. Each box of candy is expected to require 0.10 hours of labor (6 minutes). Connie's Candy found that the actual rate of pay per hour for labor was $7.50. They still actually required 0.10 hours of labor to make each box. The direct labor rate variance computes as:

$$Direct\ Labor\ Rate\ Variance\ =$$
$$(\ \$7.50 - \$8.00\ )\ \times\ 0.10\ hours\ =\ -\$0.05\ or\ \$0.05\ (\ Favorable\ )$$

In this case, the actual rate per hour is $7.50, the standard rate per hour is $8.00, and the actual hour worked is 0.10 hours per box. This computes as a favorable outcome. This is a favorable outcome because the actual rate of pay was less than the standard rate of pay. As a result of this favorable outcome information, the company may consider continuing operations as they exist, or could change future budget projections to reflect higher profit margins, among other things.

Let us take the same example except now the actual rate of pay per hour is $9.50. The direct labor rate variance computes as:

$$Direct\ Labor\ Rate\ Variance\ =$$
$$(\ \$9.50 - \$8.00\ )\ \times\ 0.10\ hours\ =\ \$0.15\ or\ \$0.15\ (\ Unfavorable\ )$$

In this case, the actual rate per hour is $9.50, the standard rate per hour is $8.00, and the actual hours worked per box are 0.10 hours. This computes as an unfavorable outcome. This is an unfavorable outcome because the actual rate per hour was more than the standard rate per hour. As a result of this unfavorable outcome information, the company may consider using cheaper labor, changing the production process to be more efficient, or increasing prices to cover labor costs.

Another element this company and others must consider is a direct labor time variance.

Direct Labor Time Variance

The direct labor time variance compares the actual labor hours used to the standard labor hours that were expected to be used to make the actual units produced. The variance is calculated using this formula:

$$\text{Direct Labor Time Variance} = \left(\begin{matrix}\text{Actual Hours Worked} \\ \times \\ \text{Standard Rate per Hour}\end{matrix}\right) - \left(\begin{matrix}\text{Standard Hours} \\ \times \\ \text{Standard Rate per Hour}\end{matrix}\right)$$

Figure 10.40 *By: Rice University OpenStax CC BY-NC-SA 4.0*

Factoring out the standard rate per hour from both components of the formula, it can be rewritten as:

$$\text{Direct Labor Time Variance} = \left(\begin{matrix}\text{Actual Hours} \\ \text{Worked}\end{matrix} - \begin{matrix}\text{Standard Hours Expected} \\ \text{for the Units Produced}\end{matrix}\right) \times \begin{matrix}\text{Standard Rate} \\ \text{per Hour}\end{matrix}$$

Figure 10.41 *By: Rice University OpenStax CC BY-NC-SA 4.0*

With either of these formulas, the actual hours worked refers to the actual number of hours used at the actual production output. The standard rate per hour is the expected hourly rate paid to workers. The standard hours are the expected number of hours used at the actual production output. If there is no difference between the actual hours worked and the standard hours, the outcome will be zero, and no variance exists.

If the actual hours worked are less than the standard hours at the actual production output level, the variance will be a favorable variance. A favorable outcome means you used fewer hours than anticipated to make the actual number of production units. If, however, the actual hours worked are greater than the standard hours at the actual production output level, the variance will be unfavorable. An unfavorable

outcome means you used more hours than anticipated to make the actual number of production units.

The actual hours used can differ from the standard hours because of improved efficiencies in production, carelessness or inefficiencies in production, or poor estimation when creating the standard usage.

Consider the previous example with Connie's Candy Company. Connie's Candy establishes a standard rate per hour for labor of $8.00. Each box of candy is expected to require 0.10 hours of labor (6 minutes). Connie's Candy found that the actual hours worked per box were 0.05 hours (3 minutes). The actual rate per hour for labor remained at $8.00 to make each box. The direct labor time variance computes as:

$$Direct\ Labor\ Time\ Variance\ =$$
$$(\ 0.05 - 0.10\ )\ \times\ \$8.00\ per\ hour\ =\ -\$0.40\ or\ \$0.40\ (\ Favorable\ )$$

In this case, the actual hours worked are 0.05 per box, the standard hours are 0.10 per box, and the standard rate per hour is $8.00. This computes as a favorable outcome. This is a favorable outcome because the actual hours worked were less than the standard hours expected. As a result of this favorable outcome information, the company may consider continuing operations as they exist, or could change future budget projections to reflect higher profit margins, among other things.

Let us take the same example except now the actual hours worked are 0.20 hours per box. The direct labor time variance computes as:

$$Direct\ Labor\ Time\ Variance\ =$$
$$(\ \$0.20 - \$0.10\ )\ \times\ \$8.00\ per\ hour\ =\ \$0.80\ or\ \$0.80\ (\ Unfavorable\ )$$

In this case, the actual hours worked per box are 0.20, the standard hours per box are 0.10, and the standard rate per hour is $8.00. This computes as an unfavorable outcome. This is an unfavorable outcome because the actual hours worked were more than the standard hours expected per box. As a result of this unfavorable outcome information, the company

may consider retraining its workers, changing the production process to be more efficient, or increasing prices to cover labor costs.

The combination of the two variances can produce one overall total direct labor cost variance.

Total Direct Labor Variance

When a company makes a product and compares the actual labor cost to the standard labor cost, the result is the total direct labor variance.

$$\text{Total Direct Labor Variance} = (\text{Actual Hours} \times \text{Actual Rate}) - (\text{Standard Hours} \times \text{Standard Rate})$$

Figure 10.42 *By: Rice University OpenStax CC BY-NC-SA 4.0*

If the outcome is unfavorable, the actual costs related to labor were more than the expected (standard) costs. If the outcome is favorable, the actual costs related to labor are less than the expected (standard) costs.

The total direct labor variance is also found by combining the direct labor rate variance and the direct labor time variance. By showing the total direct labor variance as the sum of the two components, management can better analyze the two variances and enhance decision-making.

Figure 10.43 shows the connection between the direct labor rate variance and direct labor time variance to total direct labor variance.

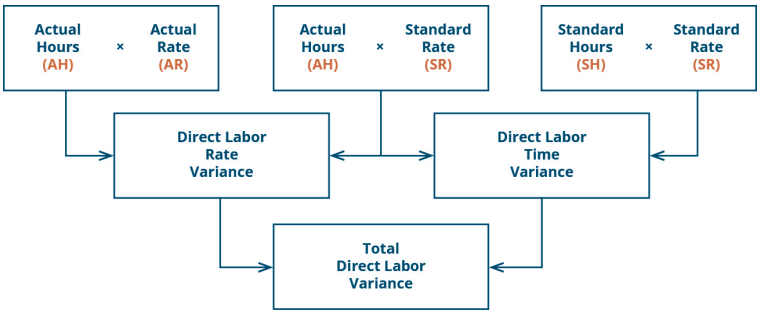


Figure 10.43 Direct Labor Variance *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

For example, Connie's Candy Company expects to pay a rate of $8.00 per hour for labor but actually pays $9.50 per hour. The company expected to use 0.10 hours of labor per box but actually used 0.20 hours per box. The total direct labor variance is computed as:

$$Total\ Direct\ Labor\ Time\ Variance\ = (\ 0.20\ hours\ \times\ \$9.50\ ) - (\ 0.10\ hours\ \times\ \$8.00\ )\ =\ \$1.90 - \$0.80\ = \$1.10\ (\ Unfavorable\ )$$

In this case, two elements are contributing to the unfavorable outcome. Connie's Candy paid $1.50 per hour more for labor than expected and used 0.10 hours more than expected to make one box of candy. The same calculation is shown as follows using the outcomes of the direct labor rate and time variances.

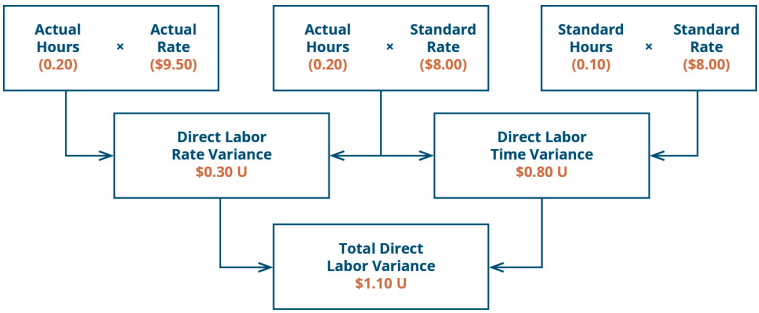


Figure 10.44 *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

As with the interpretations for the labor rate and time variances, the company would review the individual components contributing to the overall unfavorable outcome for the total direct labor variance, and possibly make changes to production elements as a result.

YOUR TURN

Sweet and Fresh Shampoo Labor

Biglow Company makes a hair shampoo called Sweet and Fresh. Each bottle has a standard labor cost of 1.5 hours at $35.00 per hour. During May, Biglow manufactured 11,000 bottles. They used 16,000 hours at a cost of $565,600. Calculate the labor rate variance, labor time variance, and total labor variance.

Solution

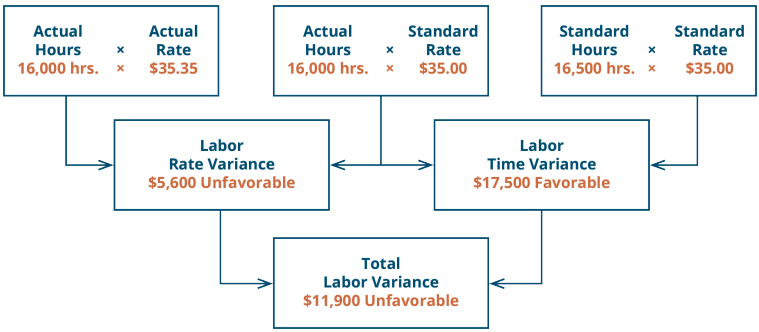


Figure 10.45 *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

CONCEPTS IN PRACTICE

Labor Costs in Service Industries

In the service industry, labor is the main cost. Doctors, for example, have a time allotment for a physical exam and base their fee on the expected time. Insurance companies pay doctors according to a set schedule, so they set the labor standard. They pay a set rate for a physical exam, no matter how long it takes. If the exam takes longer than expected, the doctor is not compensated for that extra time. This would produce an unfavorable labor variance for the doctor. Doctors know the standard and try to schedule accordingly so a variance does not exist. If anything, they try to produce a favorable variance by seeing more patients in a quicker time frame to maximize their compensation potential.

Long Description

There are three top row boxes. Two, Actual Hours (AH) times Actual Rate (AR) and Actual Hours (AH) times Standard Rate (SR) combine to point to a Second row box: Direct Labor Rate Variance. Two top row boxes: Actual Hours (AH) times Standard Rate (SR) and Standard Hours (SH) times Standard Rate (SR) combine to point to Second row box: Direct Labor Time Variance. Notice the middle top row box is used for both of the variances. Second row boxes: Direct Labor Rate Variance and Direct Labor Time Variance combine to point to bottom row box: Total Direct Labor Variance. Return

There are three top row boxes. Two, Actual Hours (0.20) times Actual Rate ($9.50) and Actual Hours (0.20) times Standard Rate ($8.00) combine to point to a Second row box: Direct Labor Rate Variance $0.30 U. Two top row boxes: Actual Hours (0.20) times Standard Rate ($8.00) and Standard Hours (0.10) times Standard Rate ($8.00) combine to point to Second row box: Direct Labor Time Variance $0.80 U. Notice the middle top row box is used for both of the variances. Second row boxes: Direct Labor Rate Variance $0.30 U and Direct Labor Time Variance $0.80 U combine to point to bottom row box: Total Direct Labor Variance $1.10 U. Return

There are three top row boxes. Two, Actual Hours (16,000) times Actual Rate ($35.35) and Actual Hours (16,000) times Standard Rate ($35.00) combine to point to a Second row box: Direct Labor Rate Variance $5,600 U. Two top row boxes: Actual Hours (16,000) times Standard Rate ($35.00) and Standard Hours (16,500) times Standard Rate ($35.00) combine to point to Second row box: Direct Labor Time Variance $17,500 F. Notice the middle top row box is used for both of the variances. Second row boxes: Direct Labor Rate Variance $5,650 U and Direct Labor Time Variance $17,500 F combine to point to bottom row box: Total Direct Labor Variance $11,900 U. Return

10.8 Overhead Variances

Recall that the standard cost of a product includes not only materials and labor but also variable and fixed overhead. It is likely that the amounts determined for standard overhead costs will differ from what actually occurs. This will lead to overhead variances.

Determination and Evaluation of Overhead Variance

In a standard cost system, overhead is applied to the goods based on a standard overhead rate. This is similar to the predetermined overhead rate used previously. The standard overhead rate is calculated by dividing budgeted overhead at a given level of production (known as normal capacity) by the level of activity required for that particular level of production.

$$\text{Standard Overhead Rate} = \frac{\text{Budgeted Overhead Rate}}{\text{Level of Activity}}$$

Figure 10.46 *By: Rice University Openstax CC BY NC SA 4.0*

Usually, the level of activity is either direct labor hours or direct labor cost, but it could be machine hours or units of production.

Creation of Flexible Overhead Budget

To determine the overhead standard cost, companies prepare a flexible budget that gives estimated revenues and costs at varying levels of production. The standard overhead cost is usually expressed as the sum of its component parts, fixed and variable costs per unit. Note that at different levels of production, total fixed costs are the same, so the standard fixed cost per unit will change for each production level. However, the variable standard cost per unit is the same per unit for each level of production, but the total variable costs will change.

We continue to use Connie's Candy Company to illustrate. Suppose Connie's Candy budgets capacity of production at 100% and determines expected overhead at this capacity. Connie's Candy also wants to understand what overhead cost outcomes will be at 90% capacity and 110% capacity. The following information is the flexible budget Connie's Candy prepared to show expected overhead at each capacity level.

Percent of capacity	**90%**	**100%**	**110%**
Direct labor hours	1,800	2,000	2,200
Units of output	900	1,000	1,100
Variable overhead	$3,600	$ 4,000	$ 4,400
Fixed overhead	$6,000	$ 6,000	$ 6,000
Total overhead	$9,600	$10,000	$10,400

Normal capacity = 100% and overhead is applied based on direct labor hours
Standard Overhead Rate = $10,000/2,000 = $5 per direct labor hour

Figure 10.47 *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

Units of output at 100% is 1,000 candy boxes (units). The standard overhead rate is the total budgeted overhead of $10,000 divided by the level of activity (direct labor hours) of 2,000 hours. Notice that fixed overhead remains constant at

each of the production levels, but variable overhead changes based on unit output. If Connie's Candy only produced at 90% capacity, for example, they should expect total overhead to be $9,600 and a standard overhead rate of $5.33 (rounded). If Connie's Candy produced 2,200 units, they should expect total overhead to be $10,400 and a standard overhead rate of $4.73 (rounded). In addition to the total standard overhead rate, Connie's Candy will want to know the variable overhead rates at each activity level.

Using the flexible budget, we can determine the standard variable cost per unit at each level of production by taking the total expected variable overhead divided by the level of activity, which can still be direct labor hours or machine hours.

$$\text{Variable Overhead Rate} = \frac{\text{Budgeted Variable Overhead}}{\text{Level of Activity}}$$

Figure 10.48 *By: Rice University Openstax CC BY NC SA 4.0*

Looking at Connie's Candies, the following table shows the variable overhead rate at each of the production capacity levels.

Table 10.2 Variable Overhead Rate at each Production Capacity Level By: Rice University OpenStax CC BY-NC-SA 4.0

Production Capacity	Variable/Unit
90%	$3,600 ÷ 1,800 = $2
100%	$4,000 ÷ 2,000 = $2
110%	$4,400 ÷ 2,200 = $2

Sometimes these flexible budget figures and overhead rates differ from the actual results, which produces a variance.

Determination of Variable Overhead Variances

There are two components to variable overhead rates: the overhead application rate and the activity level against which that rate was applied. If we compare the actual variable overhead to the standard variable overhead, by analyzing the difference between actual overhead costs and the standard overhead for current production, it is difficult to determine if the variance is due to application rate differences or activity level differences. Thus, there are two variable overhead variances that will better provide these answers: the variable overhead rate variance and the variable overhead efficiency variance.

Determination of Variable Overhead Rate Variance

The variable overhead rate variance, also known as the spending variance, is the difference between the actual variable manufacturing overhead and the variable overhead that was expected given the number of hours worked. The variable overhead rate variance is calculated using this formula:

$$\text{Variable Overhead Rate Variance} = \left(\begin{array}{c}\text{Actual Hours Worked}\\ \times \\ \text{Actual Variable Overhead Rate per Hour}\end{array}\right) - \left(\begin{array}{c}\text{Actual Hours Worked}\\ \times \\ \text{Standard Variable Overhead Rate per Hour}\end{array}\right)$$

Figure 10.49 *By: Rice University Openstax CC BY NC SA 4.0*

Factoring out actual hours worked, we can rewrite the formula as

$$\text{Variable Overhead Rate Variance} = \left(\text{Actual Variable Overhead Rate} - \text{Standard Variable Overhead Rate}\right) \times \text{Actual Hours Worked}$$

Figure 10.50 *By: Rice University Openstax CC BY NC SA 4.0*

If the outcome is favorable (a negative outcome occurs in the calculation), this means the company spent less than what it had anticipated for variable overhead. If the outcome is unfavorable (a positive outcome occurs in the calculation), this means the company spent more than what it had anticipated for variable overhead.

Connie's Candy Company wants to determine if its variable overhead spending was more or less than anticipated. Connie's Candy had this data available in the flexible budget:

Percent of capacity	**100%**
Direct labor hours	2,000
Units of output	1,000
Variable overhead	$ 4,000
Fixed overhead	$ 6,000
Total overhead	$10,000

Figure 10.51 *By: Rice University Openstax CC BY NC SA 4.0*

Connie's Candy also had this actual output information:

Percent of capacity	100%
Direct labor hours	2,500
Units of output	1,000
Variable overhead	$ 7,000
Fixed overhead	$ 6,000
Total overhead	$13,000

Figure 10.52 *By: Rice University Openstax CC BY NC SA 4.0*

To determine the variable overhead rate variance, the standard variable overhead rate per hour and the actual variable overhead rate per hour must be determined. The standard variable overhead rate per hour is $2.00 ($4,000 ÷ 2,000 hours), taken from the flexible budget at 100% capacity. The actual variable overhead rate is $2.80 ($7,000 ÷ 2,500), taken from the actual results at 100% capacity. Therefore,

$$Variable\ Overhead\ Rate\ Variance\ = \ (\ \$2.80 - \$2.00\ )\ \times\ 2,500\ =\ \$2,000\ (\ Unfavorable\ )$$

This produces an unfavorable outcome. This could be for many reasons, and the production supervisor would need to determine where the variable cost difference is occurring to make production changes.

Let us look at another example producing a favorable outcome. Connie's Candy had this data available in the flexible budget:

Percent of capacity	100%
Direct labor hours	2,000
Units of output	1,000
Variable overhead	$ 4,000
Fixed overhead	$ 6,000
Total overhead	$10,000

Figure 10.53 *By: Rice University Openstax CC BY NC SA 4.0*

Connie's Candy also had this actual output information:

Percent of capacity	100%
Direct labor hours	2,000
Units of output	1,000
Variable overhead	$3,500
Fixed overhead	$6,000
Total overhead	$9,500

Figure 10.54 *By: Rice University Openstax CC BY NC SA 4.0*

To determine the variable overhead rate variance, the standard variable overhead rate per hour and the actual variable overhead rate per hour must be determined. The standard variable overhead rate per hour is $2.00 ($4,000 ÷ 2,000 hours), taken from the flexible budget at 100% capacity. The actual variable overhead rate is $1.75 ($3,500 ÷ 2,000), taken from the actual results at 100% capacity. Therefore,

$$Variable\ Overhead\ Rate\ Variance\ =$$
$$(\ \$1.75 - \$2.00\ )\ \times\ \$2,000\ =\ -\$500\ or\ \$500\ (\ Favorable\ )$$

This produces a favorable outcome. This could be for many reasons, and the production supervisor would need to determine where the variable cost difference is occurring to better understand the variable overhead reduction.

Interpretation of the variable overhead rate variance is often difficult because the cost of one overhead item, such as indirect labor, could go up, but another overhead cost, such as indirect materials, could go down. Often, explanation of this variance will need clarification from the production supervisor. Another variable overhead variance to consider is the variable overhead efficiency variance.

Determination of Variable Overhead Efficiency Variance

The variable overhead efficiency variance, also known as the controllable variance, is driven by the difference between the actual hours worked and the standard hours expected for the units produced. This variance measures whether the allocation base was efficiently used. The variable overhead efficiency variance is calculated using this formula:

$$\text{Variable Overhead Efficiency Variance} = \left(\begin{array}{c}\text{Actual Hours Worked}\\ \times \\ \text{Standard Variable Overhead Rate per Hour}\end{array}\right) - \left(\begin{array}{c}\text{Standard Hours}\\ \times \\ \text{Standard Variable Overhead Rate per Hour}\end{array}\right)$$

Figure 10.55 *By: Rice University Openstax CC BY NC SA 4.0*

Factoring out standard overhead rate, the formula can be written as

$$\text{Variable Overhead Efficiency Variance} = (\text{Actual Labor Hours} - \text{Standard Labor Hours}) \times \text{Standard Overhead Rate}$$

Figure 10.56 *By: Rice University Openstax CC BY NC SA 4.0*

If the outcome is favorable (a negative outcome occurs in the calculation), this means the company was more efficient than what it had anticipated for variable overhead. If the outcome is unfavorable (a positive outcome occurs in the calculation), this means the company was less efficient than what it had anticipated for variable overhead.

Connie's Candy Company wants to determine if its variable overhead efficiency was more or less than anticipated. Connie's Candy had the following data available in the flexible budget:

Percent of capacity	**100%**
Direct labor hours	2,000
Units of output	1,000
Variable overhead	$ 4,000
Fixed overhead	$ 6,000
Total overhead	$10,000

Figure 10.57 *By: Rice University Openstax CC BY NC SA 4.0*

Connie's Candy also had the following actual output information:

Percent of capacity	100%
Direct labor hours	2,500
Units of output	1,000
Variable overhead	$ 7,000
Fixed overhead	$ 6,000
Total overhead	$13,000

Figure 10.58 *By: Rice University Openstax CC BY NC SA 4.0*

To determine the variable overhead efficiency variance, the actual hours worked and the standard hours worked at the production capacity of 100% must be determined. Actual hours worked are 2,500, and standard hours are 2,000. The standard variable overhead rate per hour is $2.00 ($4,000 ÷ 2,000 hours), taken from the flexible budget at 100% capacity. Therefore,

$$Variable\ Overhead\ Efficiency\ Variance\ = (\ 2,500 - 2,000\ ) \times \$2.00\ =\ \$1,000\ (\ Unfavorable\ )$$

This produces an unfavorable outcome. This could be for many reasons, and the production supervisor would need to determine where the variable cost difference is occurring to make production changes.

Let us look at another example producing a favorable outcome. Connie's Candy had the following data available in the flexible budget:

Percent of capacity	100%
Direct labor hours	2,000
Units of output	1,000
Variable overhead	$ 4,000
Fixed overhead	$ 6,000
Total overhead	$10,000

Figure 10.59 *By: Rice University Openstax CC BY NC SA 4.0*

Connie's Candy also had the following actual output information:

Percent of capacity	100%
Direct labor hours	1,800
Units of output	1,000
Variable overhead	$3,500
Fixed overhead	$6,000
Total overhead	$9,500

Figure 10.60 *By: Rice University Openstax CC BY NC SA 4.0*

To determine the variable overhead efficiency variance, the actual hours worked and the standard hours worked at the production capacity of 100% must be determined. Actual hours worked are 1,800, and standard hours are 2,000. The standard variable overhead rate per hour is $2.00 ($4,000 ÷ 2,000 hours), taken from the flexible budget at 100% capacity. Therefore,

$$Variable\ Overhead\ Efficiency\ Variance\ =$$
$$(\ 1,800 - 2,000\ )\ \times\ \$2.00\ =\ -\$400\ or\ \$400\ (\ Favorable\ )$$

This produces a favorable outcome. This could be for many reasons, and the production supervisor would need to determine where the variable cost difference is occurring to better understand the variable overhead efficiency reduction.

The total variable overhead cost variance is also found by combining the variable overhead rate variance and the variable overhead efficiency variance. By showing the total variable overhead cost variance as the sum of the two components, management can better analyze the two variances and enhance decision-making.

Figure 10.61 shows the connection between the variable overhead rate variance and variable overhead efficiency variance to total variable overhead cost variance.

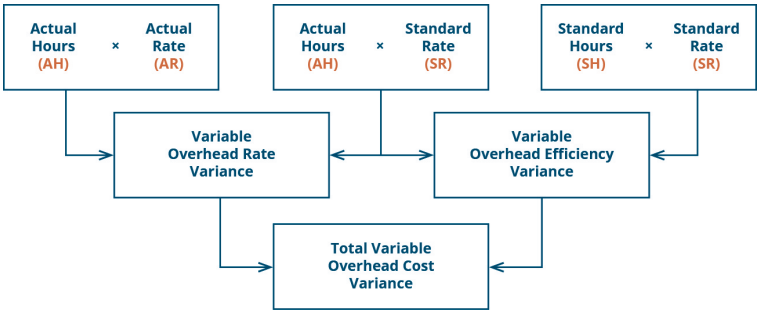


Figure 10.61 Variable Overhead Cost Variance *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

For example, Connie's Candy Company had the following data available in the flexible budget:

Percent of capacity	100%
Direct labor hours	2,000
Units of output	1,000
Variable overhead	$ 4,000
Fixed overhead	$ 6,000
Total overhead	$10,000

Figure 10.62 *By: Rice University Openstax CC BY NC SA 4.0*

Connie's Candy also had the following actual output information:

Percent of capacity	100%
Direct labor hours	1,800
Units of output	1,000
Variable overhead	$3,500
Fixed overhead	$6,000
Total overhead	$9,500

Figure 10.63 *By: Rice University Openstax CC BY NC SA 4.0*

The variable overhead rate variance is calculated as (1,800 × $1.94) – (1,800 × $2.00) = –$108, or $108 (favorable). The variable overhead efficiency variance is calculated as (1,800 × $2.00) – (2,000 × $2.00) = –$400, or $400 (favorable).

The total variable overhead cost variance is computed as:

$$Total\ Variable\ Overhead\ Cost\ Variance\ = (-\$108) + (-\$400) = -\$508\ or\ \$508\ (Favorable)$$

In this case, two elements are contributing to the favorable outcome. Connie's Candy used fewer direct labor hours and less variable overhead to produce 1,000 candy boxes (units).

The same calculation is shown as follows in diagram format.

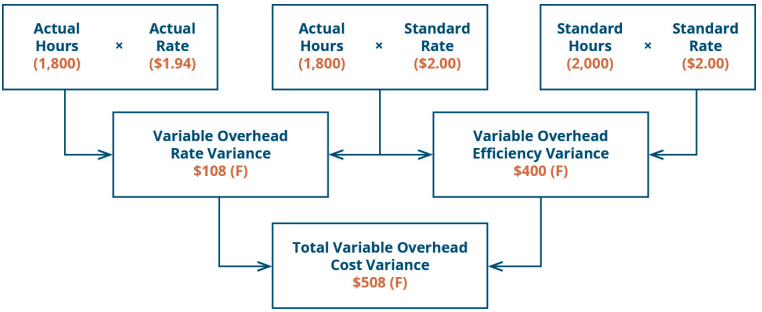


Figure 10.64 *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

As with the interpretations for the variable overhead rate and efficiency variances, the company would review the individual components contributing to the overall favorable outcome for the total variable overhead cost variance, before making any decisions about production in the future. Other variances companies consider are fixed factory overhead variances.

Fundamentals of Fixed Factory Overhead Variances

The fixed factory overhead variance represents the difference between the actual fixed overhead and the applied fixed overhead. There are two fixed overhead variances. One variance determines if too much or too little was spent on fixed

overhead. The other variance computes whether or not actual production was above or below the expected production level.

YOUR TURN

Sweet and Fresh Shampoo Overhead

Biglow Company makes a hair shampoo called Sweet and Fresh. They have the following flexible budget data:

	90%	100%	110%
Direct labor hours	14,000	16,000	18,000
Units of output	10,000	10,000	10,000
Direct labor	$525,000	$ 346,500	$ 378,000
Variable overhead	$315,000	$ 346,000	$ 378,000
Fixed overhead	$ 45,500	$ 45,500	$ 45,500
Total	$953,500	$1,044,300	$1,135,100

Figure 10.65 *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

What is the standard variable overhead rate at 90%, 100%, and 110% capacity levels?

Solution

90% = $315,000 ÷ 14,000 = $22.50, 100% = $346,000 ÷ 16,000 = $21.63 (rounded), 110% = $378,000 ÷ 18,000 = $21.00.

Long Description

Percent of capacity: 90 percent, 100 percent, 110 percent respectively. Direct labor hours 1,800, 2,000, 2,200. Units of

output 900, 1,000, 1,100. Variable overhead $3,600, 4,000, 4,400. Fixed overhead $6,000, 6,000, 6,000. Total overhead $9,600, 10,000, 10,400. Normal capacity equals 100 percent and overhead is applied based on direct labor hours. Standard Overhead Rate equals $10,000 divided by 2,000 equals $5 per direct labor hour. Return

There are three top row boxes. Two, Actual Hours (AH) times Actual Rate (AR) and Actual Hours (AH) times Standard Rate (SR) combine to point to a Second row box: Variable Overhead Rate Variance. Two top row boxes: Actual Hours (AH) times Standard Rate (SR) and Standard Hours (SH) times Standard Rate (SR) combine to point to Second row box: Variable Overhead Efficiency Variance. Notice the middle top row box is used for both of the variances. Second row boxes: Variable Overhead Rate Variance and Variable Overhead Efficiency Variance combine to point to bottom row box: Total Variable Overhead Cost Variance. Return

There are three top row boxes. Two, Actual Hours (1,800) times Actual Rate ($1.94) and Actual Hours (1,800) times Standard Rate ($2.00) combine to point to a Second row box: Variable Overhead Rate Variance $108 Favorable. Two top row boxes: Actual Hours (1800) times Standard Rate ($2.00) and Standard Hours (2,000) times Standard Rate ($2.00) combine to point to Second row box: Variable Overhead Efficiency Variance $400 Favorable. Notice the middle top row box is used for both of the variances. Second row boxes: Variable Overhead Rate Variance $108 F and Variable Overhead Efficiency Variance $400 F combine to point to bottom row box: Total Variable Overhead Cost Variance $508 F. Return

For 90 percent, 100 percent, and 110 percent, respectively: Direct labor hours 14,000, 16,000, 18,000; Units of output 10,000, 10,000, 10,000; Direct labor $525,000, $346,500, $378,000; Variable overhead $315,000, $346,000, $378,000; Fixed overhead $45,500, $45,500, $45,500; Total $953,500, $1,044,300, $1,135,100. Return

10.9 Management's Use of Variance Analysis

Companies use variance analysis in different ways. The starting point is the determination of standards against which to compare actual results. Many companies produce variance reports, and the management responsible for the variances must explain any variances outside of a certain range. Some companies only require that unfavorable variances be explained, while many companies require both favorable and unfavorable variances to be explained.

Requiring managers to determine what caused unfavorable variances forces them to identify potential problem areas or consider if the variance was a one-time occurrence. Requiring managers to explain favorable variances allows them to assess whether the favorable variance is sustainable. Knowing what caused the favorable variance allows management to plan for it in the future, depending on whether it was a one-time variance or it will be ongoing.

Another possibility is that management may have built the favorable variance into the standards. Management may overestimate the material price, labor rate, material quantity, or labor hours per unit, for example. This method of overestimation, sometimes called *budget slack*, is built into the standards so management can still look good even if costs are higher than planned. In either case, managers potentially can help other managers and the company overall by noticing particular problem areas or by sharing knowledge that can improve variances.

Often, management will manage “to the variances,” meaning

they will make decisions that may not be advantageous to the company's best interests over the long run, in order to meet the variance report threshold limits. This can occur when the standards are improperly established, causing significant differences between actual and standard numbers.

Management can use standard costs to prepare the budget for the upcoming period, using the past information to possibly make changes to production elements. Standard costs are a measurement tool and can thus be used to evaluate performance. As you've learned, management may manage "to the variances" and can manipulate results to meet expectations. To reduce this possibility, performance should be measured on multiple outcomes, not simply on standard cost variances.

As shown in Table 10.3, standard costs have pros and cons to consider when using them in the decision-making and evaluation processes.

Table 10.3 Standard Costs By: Rice University OpenStax CC BY-NC-SA 4.0

Pros	Cons
• Useful when developing a future budget • Can be used as a benchmark for performance and quality expectations • Can individually identify areas of success and areas for improvement	• Might ignore customer and employee satisfaction rates • Information could be historical data and not useful in real-time decision-making needs • The system to manage and develop standard costs requires a lot of resources, which could be costly and time consuming

Standard costing provides many benefits and challenges, and a thorough analysis of each variance and the possible unfavorable or favorable outcomes is required to set future expectations and adjust current production goals.

The following is a summary of all direct materials variances (Figure 10.66), direct labor variances (Figure 10.67), and overhead variances (Figure 10.68) presented as both formulas and tree diagrams. Note that for some of the formulas, there are two presentations of the same formula, for example, there are two presentations of the direct materials price variance. While both arrive at the same answer, students usually prefer one formula structure over the other.

$$\text{Direct Materials Price Variance} = \left(\begin{array}{c}\text{Actual Quantity Used}\\ \times \\ \text{Actual Price Paid}\end{array}\right) - \left(\begin{array}{c}\text{Actual Quantity Used}\\ \times \\ \text{Standard Price}\end{array}\right)$$

$$\text{Direct Materials Price Variance} = \left(\begin{array}{c}\text{Actual Price per}\\ \text{Unit of Materials}\end{array} - \begin{array}{c}\text{Standard Price per}\\ \text{Unit of Materials}\end{array}\right) \times \begin{array}{c}\text{Actual Quantity of}\\ \text{Materials Used}\end{array}$$

$$\text{Direct Materials Quantity Variance} = \left(\begin{array}{c}\text{Actual Quantity Used}\\ \times \\ \text{Standard Price}\end{array}\right) - \left(\begin{array}{c}\text{Standard Quantity}\\ \times \\ \text{Standard Price}\end{array}\right)$$

$$\text{Direct Materials Quantity Variance} = \left(\begin{array}{c}\text{Actual Quantity of}\\ \text{Materials Used}\\ \text{for Units Produced}\end{array} - \begin{array}{c}\text{Standard Quantity}\\ \text{of Materials Expected}\\ \text{for the Units Produced}\end{array}\right) \times \begin{array}{c}\text{Standard}\\ \text{Price}\end{array}$$

$$\text{Total Direct Materials Variance} = \left(\begin{array}{c}\text{Actual Quantity}\\ \times \\ \text{Actual Price}\end{array}\right) - \left(\begin{array}{c}\text{Standard Quantity}\\ \times \\ \text{Standard Price}\end{array}\right)$$

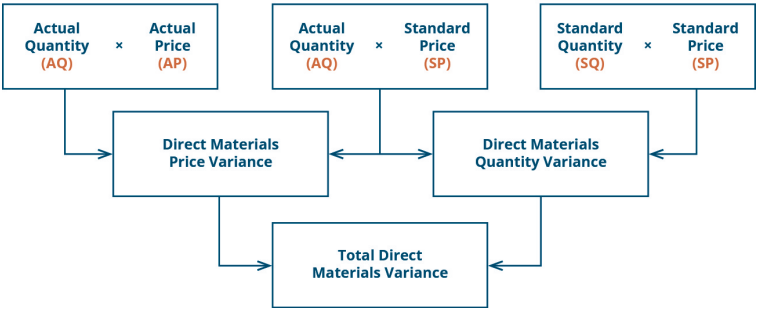


Figure 10.66 Direct Materials Variances *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

$$\text{Direct Labor Rate Variance} = \left(\begin{matrix}\text{Actual Hours Worked} \\ \times \\ \text{Actual Rate per Hour}\end{matrix}\right) - \left(\begin{matrix}\text{Actual Hours Worked} \\ \times \\ \text{Standard Rate per Hour}\end{matrix}\right)$$

$$\text{Direct Labor Rate Variance} = \left(\begin{matrix}\text{Actual Rate} \\ \text{per Hour}\end{matrix} - \begin{matrix}\text{Standard Rate} \\ \text{per Hour}\end{matrix}\right) \times \begin{matrix}\text{Actual Hours} \\ \text{Worked}\end{matrix}$$

$$\text{Direct Labor Time Variance} = \left(\begin{matrix}\text{Actual Hours Worked} \\ \times \\ \text{Standard Rate per Hour}\end{matrix}\right) - \left(\begin{matrix}\text{Standard Hours} \\ \times \\ \text{Standard Rate per Hour}\end{matrix}\right)$$

$$\text{Direct Labor Time Variance} = \left(\begin{matrix}\text{Actual Hours} \\ \text{Worked}\end{matrix} - \begin{matrix}\text{Standard Hours Expected} \\ \text{for the Units Produced}\end{matrix}\right) \times \begin{matrix}\text{Standard Rate} \\ \text{per Hour}\end{matrix}$$

$$\text{Total Direct Labor Variance} = (\text{Actual Hours} \times \text{Actual Rate}) - (\text{Standard Hours} \times \text{Standard Rate})$$

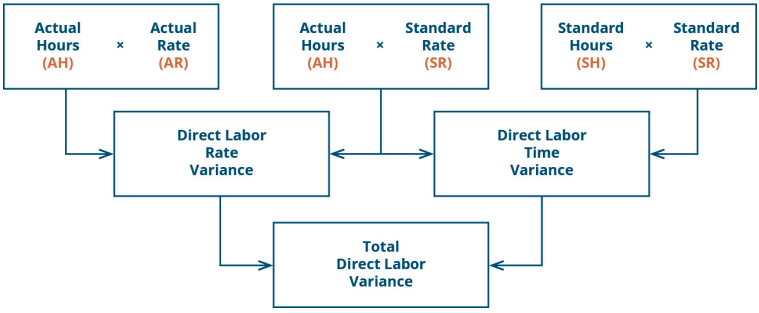


Figure 10.67 Direct Labor Variances *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

$$\text{Standard Overhead Rate} = \frac{\text{Budgeted Overhead Rate}}{\text{Level of Activity}}$$

$$\text{Variable Overhead Rate} = \frac{\text{Budgeted Variable Overhead}}{\text{Level of Activity}}$$

$$\text{Variable Overhead Rate Variance} = \left(\begin{array}{c}\text{Actual Hours Worked}\\ \times \\ \text{Actual Variable Overhead Rate per Hour}\end{array}\right) - \left(\begin{array}{c}\text{Actual Hours Worked}\\ \times \\ \text{Standard Variable Overhead Rate per Hour}\end{array}\right)$$

$$\text{Variable Overhead Rate Variance} = \left(\begin{array}{c}\text{Actual Variable}\\ \text{Overhead Rate}\end{array} - \begin{array}{c}\text{Standard Variable}\\ \text{Overhead Rate}\end{array}\right) \times \begin{array}{c}\text{Actual Hours}\\ \text{Worked}\end{array}$$

$$\text{Variable Overhead Efficiency Variance} = \left(\begin{array}{c}\text{Actual Hours Worked}\\ \times \\ \text{Standard Variable Overhead Rate per Hour}\end{array}\right) - \left(\begin{array}{c}\text{Standard Hours}\\ \times \\ \text{Standard Variable Overhead Rate per Hour}\end{array}\right)$$

$$\text{Variable Overhead Efficiency Variance} = \left(\text{Actual Labor Hours} - \text{Standard Labor Hours}\right) \times \begin{array}{c}\text{Standard}\\ \text{Overhead Rate}\end{array}$$

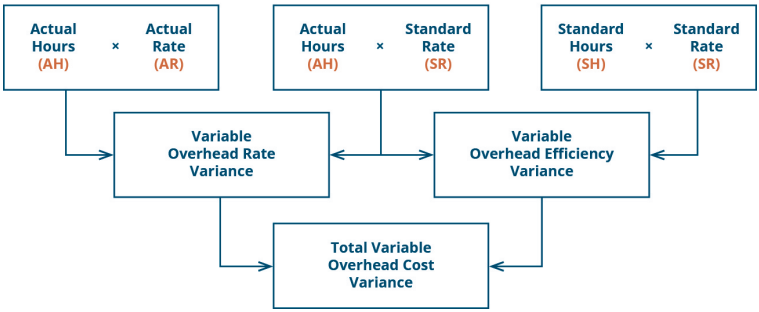


Figure 10.68 Overhead Variances *By: Rice University Openstax CC BY NC SA 4.0 Long Description*

YOUR TURN

Barley, Inc. Production

Barley, Inc., produces a product and has the following as standard costs per unit for materials and labor:

Materials	4 pounds @ $15 per pound
Labor	2 hours @ $20 per hour

Figure 10.69 *By: Rice University Openstax CC BY NC SA 4.0*

For the month of October, the following information was gathered related to production:

Beginning inventory	0
Units completed	10,000
Budgeted output units	12,000
Materials used (50,000 pounds)	$800,000
Labor (25,000 hours)	$450,000

Figure 10.70 *By: Rice University Openstax CC BY NC SA 4.0*

Compute:

A. The materials price and quantity variances
B. The labor rate and efficiency variances

Provide possible explanations for each variance.

Solution

A.

Materials price variance:

$50,000 unfavorable = ($16* – $15) × 50,000 lb.

*$800,000 ÷ 50,000

An unfavorable materials price variance occurred because the actual cost of materials was greater than the expected or standard cost. This could occur if a higher-quality material was purchased or the suppliers raised their prices.

Materials quantity variance:

$150,000 unfavorable = (50,000 lb. – 40,000* lb.) × $15 per lb.

*4 lb. × 10,000 units

An unfavorable materials quantity variance occurred because the pounds of materials used were greater than the pounds expected to be used. This could occur if there were inefficiencies in production or the quality of the materials was such that more needed to be used to meet safety or other standards.

Materials inputs:

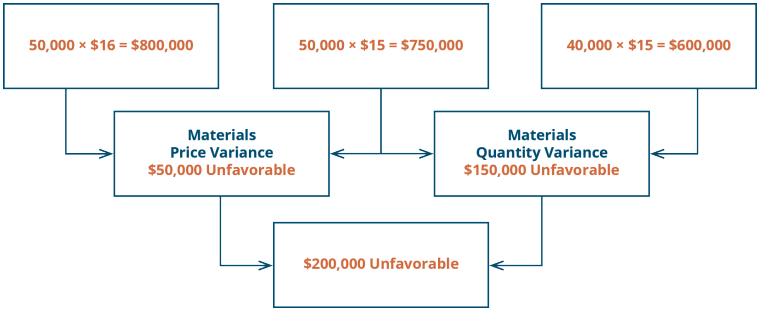


Figure 10.71 *By: Rice University Openstax CC BY NC SA 4.0*

B.

Labor rate variance:

$50,000 favorable = ($18* per hour – $20 per hour) × 25,000 hours

*$450,000 ÷ 25,000

A favorable labor rate variance occurred because the rate paid per hour was less than the rate expected to be paid (standard) per hour. This could occur because the company was able to hire workers at a lower rate, because of negotiated union contracts, or because of a poor labor rate estimate used in creating the standard.

Labor quantity variance:

$100,000 unfavorable = (25,000 hours – 20,000* hours) × $20 per hour

*2 hours × 10,000 units

An unfavorable labor quantity variance occurred because the actual hours worked to make the 10,000 units were greater than the expected hours to make that many units. This could occur because of inefficiencies of the workers, defects and errors that caused additional time reworking items, or the use of new workers who were less efficient.

Labor inputs:

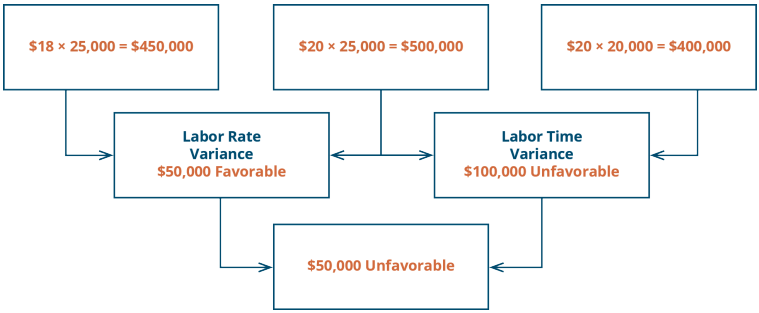


Figure 10.72 *By: Rice University Openstax CC BY NC SA 4.0*

Long Description

Direct Materials Price Variance equals (Actual Quantity Used times Actual Price Paid) minus (Actual Quantity Used times Standard Price). Direct Materials Price Variance equals (Actual

Price per Unit of Materials minus Standard Price per Unit of Materials) times Actual Quantity of Materials Used. Direct Materials Quantity Variance equals (Actual Quantity Used times Standard Price) minus (Standard Quantity times Standard Price). Direct Materials Quantity Variance equals (Actual Quantity of Materials Used for Units Produced minus Standard Quantity of Materials Expected for the Units Produced) times Standard Price. Total Direct Material Variance equals (Actual Quantity times Actual Price) minus (Standard Quantity times Standard Price). There are three top row boxes. Two, Actual Quantity (AQ) times Actual Price (AP) and Actual Quantity (AQ) times Standard Price (SP) combine to point to a Second row box: Direct Material Price Variance. Two top row boxes: Actual Quantity (AQ) times Standard Price (SP) and Standard Quantity (SQ) times Standard Price (SP) combine to point to Second row box: Direct Materials Quantity Variance. Notice the middle top row box is used for both of the variances. Second row boxes: Direct Material Price Variance and Direct Materials Quantity Variance combine to point to bottom row box: Total Direct Material Variance. Return

Direct Labor Rate Variance equals (Actual Hours Worked times Actual Rate per Hour) minus (Actual Hours Worked times Standard Rate per Hour). Direct Labor Rate Variance equals (Actual Rate per Hour minus Standard Rate per Hour) times Actual Hours Worked. Direct Labor Time Variance equals (Actual Hours Worked times Standard rate per Hour) minus (Standard Hours times Standard Rate per Hour). Direct Labor Time Variance equals (Actual Hours Worked minus Standard Hours Expected for the Units Produced) times Standard Rate per Hour. Total Direct Labor Variance minus (Actual Hours times Actual Rate) minus (Standard Hours times Standard Rate). There are three top row boxes. Two, Actual Hours (AH) times Actual Rate (AR) and Actual Hours (AH) times Standard Rate (SR) combine to point to a Second row box: Direct Labor Rate Variance. Two top row boxes: Actual Hours (AH) times

Standard Rate (SR) and Standard Hours (SH) times Standard Rate (SR) combine to point to Second row box: Direct Labor Time Variance. Notice the middle top row box is used for both of the variances. Second row boxes: Direct Labor Rate Variance and Direct Labor Time Variance combine to point to bottom row box: Total Direct Labor Variance. Return

Standard Overhead Rate equals Budgeted Overhead Rate divided by Level of Activity. Variable Overhead Rate equals Budgeted Variable Overhead divided by Level of Activity. Variable Overhead Rate Variance equals (Actual Hours Worked times Actual Variable Overhead Rate per Hour) minus (Actual Hours Worked times Standard Variable Overhead Rate per Hour). Variable Overhead Rate Variance equals (Actual Variable Overhead Rate minus Standard Variable Overhead Rate) times Actual Hours Worked. Variable Overhead Efficiency Variance equals Actual Hours Worked times Standard Variable Overhead Rate per Hour) minus (Standard Hours times Standard Variable Overhead rate per Hour). Variable Overhead Efficiency Variance equals Actual Labor Hours minus Standard Labor Hour) times Standard Overhead Rate. There are three top row boxes. Two, Actual Hours (AH) times Actual Rate (AR) and Actual Hours (AH) times Standard Rate (SR) combine to point to a Second row box: Variable Overhead Rate Variance. Two top row boxes: Actual Hours (AH) times Standard Rate (SR) and Standard Hours (SH) times Standard Rate (SR) combine to point to Second row box: Variable Overhead Efficiency Variance. Notice the middle top row box is used for both of the variances. Second row boxes: Variable Overhead Rate Variance and Variable Overhead Efficiency Variance combine to point to bottom row box: Total Variable Overhead Cost Variance Return

10.10 How Budgets are used to Evaluate Goals

As you've learned, an advantage of budgeting is evaluating performance. Having a strong understanding of their budgets helps managers keep track of expenses and work toward the company's goals. Companies need to understand their revenue and expense details to develop budgets as a tool for planning operations and cash flow. Part of understanding revenue and expenses is evaluating the prior year. Did the company earn the expected profit? Could it have earned a higher profit? What expenses or revenues were not on the budget? Critically evaluating the actual results versus the estimated budgetary results can help management plan for the future. Variance analysis helps the manager analyze its results. It does not necessarily find a problem, but it does indicate where a problem may exist. The same is true for favorable variances as well as unfavorable variances. A favorable variance occurs when revenue is higher than budgeted or expenses are lower than budgeted. An unfavorable variance is when revenue is lower than budgeted or expenses are higher than budgeted.

Table 10.4 Comparing Favorable to Unfavorable Variances By: Rice University OpenStax CC BY-NC-SA 4.0

Favorable	Unfavorable
Actual Sales > Budgeted Sales	Actual Sales < Budgeted Sales
Actual Expenses < Budgeted Expenses	Actual Expenses > Budgeted expenses

It is easy to understand that an unfavorable variance may be a problem. But that is not always true, as a higher labor rate may mean the company has a higher quality employee who is able to waste less material. Likewise, having a favorable variance

indicates that more revenue was earned or less expenses were incurred but further analysis can indicate if costs were cut too far and better materials should have been purchased.

If a company has only a static budget, meaningful comparisons are difficult. Analyzing the sales for Bid Bad Bikes will illustrate whether there was a profit and how net income impacts the company. In the third quarter, Big Bad Bikes sold 1,400 trainers and had third quarter net income of $15,915 as shown in Figure 10.73.

BIG BAD BIKES Income Statement For the Quarter Ended September 30, 2019	
Units Sold	1,400
Sales Price	$ 75
Sales	$98,000
Cost of Goods Sold	
Direct Material	$ 5,550
Direct Labor per Unit	21,500
Variable Manufacturing Overhead	4,100
Fixed Manufacturing Overhead	28,900
Total Cost of Goods Sold	60,050
Gross Profit	37,950
Variable Sales and Administration	3,550
Fixed Sales and Administration	17,500
Interest Expense	0
Income Taxes	985
Total Other Expenses	22,035
Net Income (Loss)	22,915

Figure 10.73 Actual Quarter 3 Income Statement for Big Bad Bikes
By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description

The company earned a profit during the third quarter, but what does that mean to the company? Simply having net income instead of a net loss does not help plan for the future. The third quarter static budget was for the sale of 1,500 units. Comparing that budget to the actual results shows whether there is a favorable variance or an unfavorable variance. A comparison of the actual costs with the budget for the third quarter, as shown in Figure 10.74, has a favorable variance for all of the expenses and an unfavorable variance for everything associated with revenues.

BIG BAD BIKES
Actual Versus Static Budget Variance
Quarter Ended September 30, 2019

	Actual	Budget	Variance	
Units Sold	1,400	1,500	(100)	Unfavorable
Sales Price	$ 75	$ 75	$ 75	
Sales	$105,000	$112,500	($7,500)	Unfavorable
Cost of Goods Sold				
Direct Material	$ 5,550	$ 6,000	$ 450	Favorable
Direct Labor	21,500	22,500	1,000	Favorable
Variable Manufacturing Overhead	4,100	4,500	400	Favorable
Fixed Manufacturing Overhead	28,900	29,000	100	Favorable
Total Cost of Goods Sold	60,050	62,000	1,950	Favorable
Gross Profit	44,950	50,500	(5,550)	Unfavorable
Variable Sales and Administration	3,550	3,750	200	Favorable
Fixed Sales and Administration	17,500	18,000	500	Favorable
Income Taxes	985	1,000	15	Favorable
Total Other Expenses	22,035	22,750	715	Favorable
Net Income (Loss)	22,915	27,750	(4,835)	Unfavorable

Figure 10.74 Actual versus Static Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description*

How do those results advise management when evaluating the company's performance? It is difficult to look at one variance and make a conclusion about the company or its management. However, the variances can help narrow down the areas that need addressing because they differ from the budgeted amount. For example, looking at the variance when using a static budget does not indicate the amount of the variance results because they sold 100 fewer units than budgeted. The variance for the cost of goods sold is favorable,

but it should be if production was less than the budget. A static budget does not evaluate whether costs for 1,400 were appropriate for production of those 1,400 units.

Using a static budget to evaluate performance affects the bottom line as well as the individual expenses. The net income for the sale of 1,400 units is less than the budgeted net income for 1,500 units, but it does not indicate whether expenses were appropriate for 1,400 units. If there had been 1,600 units sold, the expenses would be more than the budgeted amount, but sales would be higher. Would it be fair to evaluate a manager's control over their expenses using a static budget?

Evaluating the expenses on a flexible budget computed for the number of units sold would provide an indication of management's ability to control expenses. As shown in Figure 10.75, some expenses have a favorable variance, while others have an unfavorable variance. This type of variance analysis provides more information to evaluate management and help prepare the next year's budget. For example, the direct labor in the flexible budget comparison shows an unfavorable variance, meaning the direct labor expense was more than budgeted for the production of 1,400 units. When comparing direct labor expense, the direct labor in the static budget mentioned earlier was even larger because it computed direct labor required to manufacture 1,500 units. It is not surprising that the static budget variance is favorable because 100 fewer units were actually produced. However, that information is not as useful as the unfavorable variance when comparing 1,400 units produced versus the budgeted direct labor for 1,400 units used.

BIG BAD BIKES Actual Versus Flexible Budget Variance Quarter Ended September 30, 2019				
	Actual	**Budget**	**Variance**	
Units Sold	1,400	1,400	None	
Sales Price	$ 75	$ 75		
Sales	$105,000	$105,000	None	
Cost of Goods Sold				
Direct Material	$ 5,550	$ 5,600	$ 50	Favorable
Direct Labor	21,500	21,000	(500)	Unfavorable
Variable Manufacturing Overhead	4,100	4,200	100	Favorable
Fixed Manufacturing Overhead	28,900	29,000	100	Favorable
Total Cost of Goods Sold	60,050	59,800	(250)	Unfavorable
Gross Profit	44,950	45,200	(250)	Unfavorable
Variable Sales and Administration	3,550	3,500	(50)	Unfavorable
Fixed Sales and Administration	17,500	18,000	500	Favorable
Interest Expense	0	0	0	
Income Taxes	985	1,000	15	Favorable
Total Other Expenses	22,035	22,500	465	Favorable
Net Income (Loss)	22,915	22,700	215	Favorable

Figure 10.75 Actual versus Flexible Budget for Big Bad Bikes *By: Rice University OpenStax CC BY-NC-SA 4.0 Long Description Long Description*

Long Description

Big Bad Bikes, Income Statement, For the Quarter Ending September 30, 2019: Units Sold 1,400, Sales price $70, Sales 98,000; Cost of goods sold: Direct material $5,550, Direct labor per unit 21,500, Variable manufacturing overhead 4,100, Fixed manufacturing overhead 28,900 equals total cost of goods sold 60,050 and Gross profit of 37,950. Variable sales and admin 3,550, Fixed sales and admin 17,500, Income taxes 985 equal Total other expenses 22,035, leaving Net income of 15,915. Return

Big Bad Bikes, Actual Versus Static Budget Variance, For the Quarter Ending September 30, 2019: Actual, Budget, Variance (respectively): Units Sold 1,400, 1,500, (100) unfavorable Sales price $75, $75, $75; Sales 105,000, 112,500, (7,500) unfavorable; Cost of goods sold: Direct material $5,550, 6,000, 450 favorable; Direct labor per unit 21,500, 22,500, 1,000 favorable; Variable manufacturing overhead 4,100, 4,500, 400 favorable; Fixed

manufacturing overhead 28,900, 29,000, 100 favorable Equals Total cost of goods sold 60,050, 62,000, 1,950 favorable and Gross profit of 44,950, 50,500, (5,550) unfavorable. Variable sales and admin 3,550, 3,750, 200 favorable; Fixed sales and admin 17,500, 18,000, 500 favorable; Income taxes 985, 1,000, 15 favorable Equals Total other expenses 22,035, 22,750, 715 favorable Equals Net income of 22,915, 27,750, (4,835) unfavorable. Return

Big Bad Bikes, Actual Versus Flexible Budget Variance, For the Quarter Ending September 30, 2019. Actual, Budget, Variance (respectively): Units Sold 1,400, 1,400, none; Sales price $75, $75; Sales 105,000, 105,000 none; Cost of goods sold: Direct material $5,550, 5,600, 50 favorable; Direct labor per unit 21,500, 21,000, (500) unfavorable; Variable manufacturing overhead 4,100, 4,200, 100 favorable; Fixed manufacturing overhead 28,900, 29,000, 100 favorable; Equals Total cost of goods sold 60,050, 59,800, (250) unfavorable and Gross profit of 44,950, 45,200, (250) unfavorable. Variable sales and admin 3,550, 3,500, (50) unfavorable; Fixed sales and admin 17,500, 18,000, 500 favorable; Income taxes 985, 1,000, 15 favorable; Equals Total other expenses 22,035, 22,500, 465 favorable; Equals Net income of 22,915, 22,700, 215 favorable. Return

Change Log