Why are we doing this?
The meaning of Financial Accounting

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Man goes to doctor. Says he is depressed. He tried reading a company's financial report, and he could not understand. He could not make sense of the accounting—the endless contradictions, the trivialities.

Doctor says: "Treatment is simple. Great accounting instructor Professor Shaffer teaches at the local university. Go and take his class. That should clear things up in no time."

The man bursts into tears... "But doctor. I am Shaffer."

Preface

Purpose: This text notably differs from the usual style of publisher-provided university textbooks on technical subjects. Many such texts—for good reason—seek to serve more as a *reference*, rather than a readable book. They cover a wide breadth of topics, and state the facts about those topics plainly, without too much elaboration. That makes sense for their purposes: By including all possible subject matters that any professor, at any university, might prefer to select, expressed uncontroversially and directly, they serve to *mesh with* any professor's lectures, and stand *behind* them, as a reference. That's what they are for.

This text serves a different purpose. My goal was to make this one readable book, one sequence of ideas, developed from scratch, self-contained, assuming almost no prior business knowledge, and building, illustrating, and analyzing the most important concepts within the most engaging exposition I could manage.

- (1.) It is supposed to be **one sequence of ideas,** building **cumulatively**. This means I prune the list of specific topic matters covered, in order to focus on fleshing out the most important concepts.[1]

- (2.) It is targeted to the **first-time learner**, typically a college freshman or sophomore, with no work experience, or any prior coursework in business or finance (rather than fellow accounting professors). This means that, by the standards of those who are *not* first-time learners, it will seem excessive in its explanation of business **terminology and convention**, or in some repetitions of core concepts. Based on my experience teaching, and my memory of my time as a first-time learner myself, I am convinced that such students do, in fact, benefit from **looping back** on technical terminology and concepts that were introduced once, for the first time in their lives, three chapters prior.

- (3.) It is supposed to be **interesting** (or, at least, as interesting as possible, for a technical, introductory financial accounting course). My hope is to motivate readers to care about the ideas, and help them build their confidence in their ability to reason through them on their own. This means that the exposition seeks to *evaluate* the methods taught, and

[1] As a concrete example, I do not cover a long list of contra-Revenue accounts and related transactions. Instead, I devote that space to developing and analyzing the income-statement vs. balance-sheet approaches to accounting for bad debts—a set of concepts and tradeoffs that apply generally.

I sometimes even admit my own (current) thinking about certain issues—e.g., balance-sheet vs. income-statement methods and emphases in standards.

This is not because I hope that students or other readers will share them. (I truly don't. Selfishly, it's much more fun and interesting for me when students disagree than when they share my own thoughts, which I am well-familiar with.) It's because a good intellectual skirmish requires an opening sally. Somebody has to go first. Since I'm the author of the text, I think that has to be me. Put differently, the **arguments** in my text are not about my arguments *per se*: Their real purpose is to serve as **prompts for students' own analyses and debates**. A dry, viewpoint-less listing of the facts, in my experience, does not provide sufficient stimulus for that.

And, finally, for all the reasons above, there are some technical elisions. As one example, I omit discussion of *Comprehensive Income* from this introductory text, in order to focus on building students' intuition for an overarching core concept of accounting, the relationship between the Balance Sheet and Income Statement, with a simpler, unified logic. There are other examples. In general, I prioritize *building a coherent mental picture* over some details.

Background: This began as a set of supplementary lecture notes for BUAD 280, Introduction to Financial Accounting, taught at the University of Southern California, in Fall 2019. The original purpose was to further explain and reinforce the key material in the official course textbook, *Financial Accounting, 5th ed.*, by Spiceland, Thomas, and Herrmann. These notes were originally based heavily on that text, and the slides and lectures I originally built around it. I owe enormous credit to its authors. I have sought, with some exceptions (which I flag), to make the terminological conventions consistent with that text, for the sake of my students. However, at this point, the exposition is independent and I take sole responsibility for any errors.

I created this text by meshing (i.) my course slides, (ii.) my supplementary notes, and (iii.) the audio transcript of my lectures, asking my RAs to place it into an open-source LaTeX template, and then using each subsequent lecture-prep as an opportunity to refine and edit. A note to fellow professors: Thanks to modern audio recording and transcription within the classroom, it is surprisingly easy to capitalize your course into a lecture-note book (at least, after prepping and teaching the course). And, in my experience, students benefit from having such a text. That way, there are **"no mysteries, no surprises"** (my teaching mantra)—no chasm between what they hear in lecture, and what they have in writing, to review at any time, before and/or after class.

This text has not been professionally reviewed. Perhaps you got what you paid for.

I thank my excellent research assistants, David Cai and Jack Zhou, for typesetting, proofing, and consultation, in translating my course slides and lectures into this book.

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Introduction and Overview

If you're studying this subject now, you've probably done an Econ 101 class. So, let's start with something you learned in that class, and which you may think you have a handle on. In Econ 101, you presumably worked with models assuming that "firms maximize their profits." Now, answer two questions:

- What *is* 'profit'?
- *Why* would we assume that firms maximize it?

These are both non-trivial, non-obvious, challenging, important questions.

Consider the first question, 'what is profit?' Until we specify exactly how we quantify it, that word 'profit' is just that—a word. To make this question concrete, let's suppose you start a business, and do the following things in your first year...:

- Put in $50k of your own money,
- get another $20k investment from your cousin,
- and a $100k loan from a bank.
- Then, buy a bunch of shirts (inventory) for $90k.
- Then, sell 50% of them for $80k in cash...
- and sell another 10% of them to customers who promise to pay *later*, $18k total.

- Then, you pay the bank $6k in interest on the loan,
- and a proportional '**dividend**' to yourself and your cousin—$5k and $2k each.

What is your 'profit' this year? What do you think? Gather the numbers above. Which of those 'count' toward or against profit?

Now consider the second question: **Why** would we assume that firms maximize 'profit' (whatever it is)? This is a non-trivial question! Firms are run by regular people, with normal desires. If they are making decisions, why would they **maximize** the firms' profits instead of their own **fun**? Or, if we think they are saintly, dutiful people, why would they maximize corporate profits instead of **aggregate social welfare**?

Here's the short answer: Accounting is ultimately about **information**, **performance measurement**, and **accountability**. 'Profit' is the accounting system's way of attempting to measure the value (wealth) that has been realized for a company's *owners*. And those owners have the ultimate lever of **control** over the company—the managers and employees of the company are ultimately **accountable** to them. So, if they *don't* attend to the owners' interests—as measured by the accounting system and referred to as 'profit'—they could be out of a job soon. More generally, owners use various **governance mechanisms** to enforce their interests.

So, the core notions of accounting are at the center of the things you learned—and thought you knew—in Econ 101, previously. This first chapter covers those foundations. It's a bit more abstract than those to come. But these foundations matter.

1.1 The core problem of accounting: TMI

People need to make important, **informed decisions** in their dealings with businesses—whether as investors (owners), suppliers, employees, regulators, etc. (Consider, e.g., an investor deciding whether or not to buy shares; or a CEO negotiating for a compensation contract.) So, we need a way to **inform** those people about what the company has and has done and **measure its performance**.

But the **full reality** of a firm is almost **infinitely complex**—far more than any one human mind can fully take in. The core problem of accounting is one of **"Too Much Information" (TMI)**. We need a way to **measure**, **compress**, **summarize**, and **represent** all of that information in a way that gives these decision-makers the information they need, in a way they can comprehend. How do we do this? This is what accounting is all about. Accounting is like a **map**. And, as a philosopher once famously said: **"The map is not the territory."** Some information, the infinitely complex reality, is lost. But, if we cannot see the whole territory with our eyes, all at once, **we need a map**. Accounting is about how we build and read maps of companies.

1.2 What is accounting? Three definitions

Let's start with three basic definitions of accounting: a **high-level** definition, a **reductive** definition, and a **practical** definition. These will help motivate the course, and help you work through some of the difficult 'growing pains' we'll face early on:

1. High-level: Accounting is the system that tracks, **measures,** verifies, summarizes, and **communicates** the activities and financial position and performance of a business. This definition suggests both why it is important on a social level, and why it is interesting. If we want to hold companies **accountable** for their performance and activities, exercise **control** over them (whether indirectly as investors, or directly as regulators or directors or managers), or **decide** where to **invest** our money, we need some way to **understand and assess** businesses' activities and performance. And clearly, 'measuring and representing' something as complex as a business is a challenging endeavor. Just think how complex the operations of, say, Walmart, are—what does it *mean* to **measure**, summarize, and report Walmart's activities and performance?

2. Reductive: Here's a more mundane definition of accounting: Accounting is a system of **rules** that you apply to a company's **transactions** in order to produce its **Financial Statements**. A company's **Financial Statements** are the ultimate end product of its financial accounting system, the key numbers it reports in its annual and quarterly reports. Here's a schematic representation:

$$Transactions \rightarrow \boxed{\text{Accounting}} \rightarrow Financial\ Statements$$

Equivalently, for those of you with a mathematical bent, we could say that accounting is the function f, such that:

$$f(Transactions) = Financial\ Statements$$

This definition may seem a little odd or circular, but it will be helpful to keep in mind during the early phases of the course. The reason is that, as we will see, accounting is **largely** based on core general concepts and principals, and **most of the time**, you can reason your way from those principles to understand how to account for some transaction. But, there are also some times when those core **principles** are in **tension** with each other, or where they don't provide definitive guidance—and, unfortunately, there are also **rare** cases when, for institutional and historical reasons, an accounting rule seems to **defy logic**. In those cases, we still need to know the rule.

3. Practical: Finally, here's a definition that I hope will motivate you through this tough class: Accounting is the **most useful body of business knowledge**. Practically all of the most lucrative and high-impact business careers involve serious use and knowledge of accounting. It's common to refer to accounting as the '**language of business**.' And it is. But I also like to think of accounting as the '**mechanics of business**.' A car salesperson might be able to **sell** a car, but mechanics and engineers are the ones who really understand how it works, how **gasoline** is ultimately turned into **motion**. Similarly, accounting unveils every step in the process by which a company **turns resources into profits**. This is why people with strong accounting knowledge so often end up at the top of businesses.

In fact, most of the careers that we refer to as 'finance' careers actually rely as much on what you will learn in your accounting courses as they do on the material in your finance courses. Consider the actual work that Wall Street **equity analysts** do: They work to **forecast firms' future profits**, based on the understanding of the firm's operations that they glean from its **past Financial Statements** and other disclosures. Or consider what **private equity** analysts do: They use spreadsheets filled with **financial-statement numbers** to try to identify where firms have some 'slack' where they can drive out costs, **improve profitability**, and therefore realize value. Similarly, a corporate CFO (**Chief Financial Officer**) doesn't always need to understand options pricing models—but s/he will always be thinking about, trying to understand, and being held accountable for the company's "bottom line" profits, **net income**.

1.3 A simple model of a business

Accounting is about **measuring** and **reporting** business activities. So to understand how accounting works, and why it does things the way it does, we first need to understand the basics of business. What follows is the bare bones.

A business is a legal entity that...:

1. ...uses **financing** (that is, cash funds from external sources)...
2. ...in order to **acquire resources**...
3. ...that it uses to produce **goods** and **services**...
4. ...for **sale** to **customers**...
5. ...in order to generate a **profit** (the bottom line) for its owners.

Let's first understand a bit more about the **financing**.

1.4 Financing basics

'Financing' is when a company gets **cash today**, in exchange for some kind of **future** obligation or expectation. Why do firms get financing? Simply because, when a firm is first incorporated, it has zero cash. And, in order to operate as a business, it will have to acquire resources. If it's going to pay for those resources in cash, it will have to get that cash from somewhere. So, the first step in every firm's life is: **get financing**.

There are **two major kinds** of financing that companies can use: **equity from investors** and **loans from creditors**. Almost all companies use both kinds, and the distinction between the two is the core foundation of accounting.

1.4.1 Equity financing

Equity financing refers to when **investors** give cash to the business and receive, in return, **shares of ownership** (or 'stock' or 'equity')—these shares promise them a share of future profits and (usually) the right to vote. Equity investors are technically the **owners** of the business. The terms **'equity,' 'shares,' 'shareholders,' 'stock,' 'stockholders,' 'investors,' 'owners'** are all referring to this same basic thing. When an entrepreneur founds a company, she will invest some of her own money in the corporation and thus become the first owner. Eventually, she may seek other partners and financing and thus sell **shares of ownership** to them. A publicly-traded company (such as Microsoft) technically has millions of owners (including me).

Why do investors buy shares/equity? They, naturally, hope to make a good return on their investment—to get more money back than they put in. When businesses distribute their profits to their shareholders, this is called a **'dividend.'** Shareholders naturally love it when businesses distribute these dividends—it is how they make their return, the whole reason they invested in the first place.[1] Companies are not contractually or legally obligated to pay dividends to investors—they are discretionary. But shareholders are the owners of the corporation and can vote on key matters. If the executives of the corporation **don't** prioritize their interests, the shareholders can **vote them out** of their jobs.[2]

[1] Those of you who have done finance or have a familiarity with it may know that companies can also directly **buy back** shares from shareholders and give them a return on investment that way. Additionally, shareholders can sell their shares to other investors in the **'secondary' market** (the stock market) and make a return that way—but, that return depends upon other investors' **expectations** about future payouts. For the purposes of this introductory course, I keep things simple. For now, let's work with this simple toy model of a business and accept that dividends are how investors get their return.

[2] In reality, there are a variety of **governance mechanisms** that shareholders use to get corporate managers to act in their interest. Perhaps the most direct one is just giving the corporate executives **stock-based compensation**—so that they do well if and only if common shareholders do well.

1.4.2 Credit financing

Most of us know that banks **lend** money to corporations. These **loans** are a form of **credit**, offered from the bank to the business. There is, annoyingly, a lot of different terminology for this one basic thing. We say that the banks or markets **'provide loans'** or **'supply credit'** and become **'creditors'** or **'debtholders'** or **'bondholders.'** Meanwhile, we say that the corporation **'receives loans'** or that it **'issued debt'** or **'sold bonds.'** All of these are just different terms for one basic thing: credit financing.

When creditors provide financing, they give cash to the business today, and receive a **contractual promise** that the business will pay them a fixed 'schedule' of **interest** and **principal** payments in the future.

Why do firms pay their debts? (More provocatively: Why do *you* pay your debts? Do you really *have to*?) We said above that managers of firms pay dividends to owners because those owners have ultimate control. But **creditors are not owners**. So why pay them back? Why don't companies just **take the money and run?**

The answer is that **creditors** also have various **enforcement mechanisms** specified in their **contracts**. If firms do not pay their creditors, those creditors can **seize collateral** from the firm—and since they are contractually within their rights, the **law** and local sheriff will **stand behind** the creditors as they do so. More generally, firms that do not pay their past debts will find it difficult to get new credit financing (just like a person with a **poor credit score**), and can be taken to **bankruptcy court**.[3]

But otherwise, creditors do not have ownership, or voting rights over the business—and they are not entitled to any 'upside,' *beyond* their contracted interest and principal.

1.4.3 Going deeper: What exactly *is* 'ownership'?

Many undergraduate textbooks are content to simply assert that firms can finance themselves with two kinds of financing, credit and equity, as if this is an empirical fact or happenstance about the world. But, if we dig a little bit deeper, this is not a mere empirical happenstance of our world, but is, instead, a necessary **logical axiom** for any universe in which there are contracts. In other words, it's not clear that things **could be different**. A business has *resources* (assets), and does *activities* that generate cash flows (sales). Your *liabilities* are the things that you are *contractually obligated* to pay off. So, what happens *after* a company pays what it contractually owes? What happens with the *remainder*? As a matter of **corporate arithmetic** that remainder has to

[3] I recommend searching for **"airplane repo"** on YouTube to learn more about the ultimate mechanisms enforcing corporate credit. I also recommend watching the 2020 film "Uncut Gems," one of my favorite movies, to learn more about the enforcement of debt obligations in, ahem, more *informal* markets. What would happen if you, personally, didn't pay your debts? If you didn't pay off your credit card, that would hurt your **credit score** going forward—not ideal at this phase of your life. If you financed the purchase of a Tesla, but then never made any payments, what would happen? Could the Tesla drive itself back to the dealership?

go *somewhere* and be controlled by *someone*. Put differently, there **must be a residual claimant** for things to **add up**. So, 'equity-like' relationships are a necessary consequence of any activity in which there are **contracts** and **uncertainty** about the future.

In 2016, **Oliver Hart** won the Nobel Prize in economics, largely for elucidating the meaning and implications of ownership. Here's a fundamental question: **What determines what businesses do**? Some of the things that businesses do, they do because of **legal contracts and obligations**—paying debts, obeying environmental laws, etc. But, what about **everything else**? In Oliver Hart's framework, ownership entails **"residual control rights."** Owners have the final say on everything that is **not contractually specified**. Once again, as a matter of "adding up," this must be the case—somebody has to make the decision when contracts are silent. So, in this framework, 'ownership'/'equity' is a necessary fact about any situation in which there are decisions to be made, contracts, and uncertainty about the future (and thus, "incomplete contracts"). This runs deep. E.g., **you are the 'residual claimant' in your own life**.[4]

1.4.4 Comparing and contrasting

So, businesses **have to** pay off their **creditors** first. But once they've done that, they **can** distribute their remaining profits/value at will to their **equity investors**. This is why it's common to refer to the equity investors as **'residual claimants'**—they're entitled to **whatever is left over**, after the corporation has paid off its contractual obligations. Businesses pay off their creditors because they contractually, legally have to. And they pay dividends to their investors because the investors have ownership and control.

A familiar comparison might be **mortgages**: When people buy homes, they almost always finance the initial purchase with a mortgage from a bank. ('Mortgage' is just a term for 'credit financing provided for the purchase of a house.') As a part of that mortgage you agree to pay the bank back. And if you don't, the bank can seize the collateral—the house itself. But, if you sell the house for a huge profit, the bank doesn't get to claim anything beyond the amount of the loan that you are required to pay off. You, as homeowner, are entitled to all the additional 'upside'; and the **value of your home above the amount you still owe to the bank is your "home equity."**

The preceding paragraphs are just a very brief introduction to **corporate finance**, a deep, rich area of study worth many different classes. Why this diversion in an introductory accounting class? The distinction between credit and equity financing is at the center of accounting. The core axiom of accounting, '**The Accounting Equation**' is about the **difference between creditors and owners**, and their respective rights.

[4] Think about this in the context of the movie *Uncut Gems*, if you get a chance to watch it.

1.5 Looping back: A simple model of a business

Let's go back to our simple model, and loop in what we've learned about finance.

A business is a legal entity that...:

1. ...uses financing from equity investors and creditors...
2. ...in order to acquire resources...
3. ...that it uses to produce goods and services...
4. ...for sale to customers.
5. ...The business *must* pay what it owes to its creditors...
6. ...and, beyond that, whatever is left over can be claimed by the equity owners.

We've only added a little bit to our initial model of a business—but these additions will turn out to be key to understanding accounting.

1.6 Financial Position & Performance: Core Identities

Accounting measures and summarizes both, (1.) a company's financial **position** (i.e., what resources, obligations, and thus remaining value it has) at a **point in time** and (2.) its financial **performance** (i.e., how it has added to or subtracted from that value) **over a period of time**.

Stocks and flows: An extremely general concept in accounting and other settings is the notion of "**stock" measures vs. "flow" measures.**[5] "Stock" quantities are measures of *where things are at* at a point in time—the total, cumulative balance of some amount. "Flow" quantities are measured over some period of time, and, thus can also be the *change* in some related stock measure. So, in, e.g., the context of macroeconomics, the government's total outstanding debt would be a stock measure, whereas the Gross Domestic Product (GDP) produced by some economy in some year would be a flow measure. In the context of personal finance, your yearly salary or income would be a "flow" measure, and your total net worth or wealth would be the related "stock" measure. And in the context of accounting, the profit generated over some period is a flow, while the company's total assets or net worth would be stock measures.

[5] In this context, the word 'stock' is used in a fully general sense, and does not have to do with, e.g., share of common stock traded on stock markets.

The bathtub metaphor: Almost every introductory accounting course illustrates the concept with an analogy to a **bathtub**. The **level** of the water in the bathtub is the **stock** measure, the total amount at some point in time. And the **rate** at which water is pouring in from the tap is the related **flow** measure. So, those are different measures and quantities. But, of course, the two are intimately and mechanically linked: The level is the **cumulation** of everything that has flowed in to date. And the rate of change of the level *is* the rate of flow, by definition. In accounting, you can (for now) think of the profits *flowing* into the company increasing the total *shareholders' equity*—the accounting measure of the total net worth of the company.

The core identities: The **core identities** of accounting are built around this concept: The '**Accounting Equation**' identifies the firm's financial position, based on the key "stock" measures; the '**Net Income definition**' identifies its performance over a time period, using the key "flow" measures; and the '**Retained Earnings Identity**' shows how the two are linked. These **identities are crucial, in that each one governs a key financial statement, and they show how everything fits together in accounting.** We will use them in every lecture in this course. The sections below discuss each one in detail.

1.6.1 The Accounting Equation / The Balance Sheet Equation

$$Assets = Liabilities + Shareholders' \ Equity \tag{1.1}$$

This is the equation that describes a business's position at a point in time. **Assets** are defined as **economic benefits** that the company **owns**. The most basic, fundamental asset is **Cash**—the **OG** asset. But there are many other assets. These can include physical, tangible things like **factories**, or intangible things like **patents**—or, even, things like customers' **promises** to pay the firm in the future.

Liabilities are defined as **economic costs** that the company is **obligated** to incur. Liabilities include things like debt (**loans** from creditors), but also include the value of **obligations to pay suppliers, and employees**.

Shareholders' Equity is the accounting measure of the claims of the **owners/ shareholders** on the corporation, and includes what those shareholders have **put in** via financing (buying shares). And, according to the accounting equation above, Shareholders' Equity must be equal to whatever the **difference** between the two is.[6]

There are **two ways to visualize and understand the Accounting Equation.**

[6] Some textbooks use the term 'Stockholders' Equity.' The two terms mean the exact same thing, but in the 21st century, it is more common to speak of 'shareholders.' So, to prepare you for your 21st-century careers, I will preferentially use the term 'shareholder' in lieu of 'stockholder.'

- **1. The "Sources of Financing" View**: The company has a certain amount of assets that it has acquired. And those assets had to be paid for somehow. And all of the company's financing had to come either from equity or credit. So the accounting equation tells you how much the company *has* (A), and how the purchase of those assets was *financed* (that is, L & E).
  - That is: $L+E=A$
- **2. The "What's Left Over" View**: The company's total economic **benefits** (that is, its **assets)** are equal to a certain amount (A), and its total **obligations** (that is, its **liabilities**) equal a certain amount (L). And so if the company's assets are greater than its liabilities, it can pay off everything that it owes, and whatever is **left over** is 'residual value' that can be claimed by the company's **owners**.
  - That is: $E=A-L$

Those are two different ways of **looking at** the equation. But it's one equation. So, the two are ultimately the same. Consider a simple example, and then try to visualize it both ways: I start my own business, and, as owner, paid in $600,000 of my own money, and then got a $400,000 loan from a bank, and then bought a store worth $1,000,000.

- **Sources of financing view:**
  - $L+E=A$
  - $\$400k+\$600k=\$1m$
- **"What's left over" view:**
  - $E=A-L$
  - $\$600k=\$1m-\$400k$

A natural question is: 'How do you know the store you bought is *truly worth* $1m?' That's a great question. And the answer is: We *don't* know it's 'truly worth' that. But accounting requires us to initially record the value of assets based on a **verifiable purchase price**, rather than a more subjective appraisal. There are a variety of reasons for that, which we'll discuss and debate later in the course. For *now*, let us accept it.

1.6.2 Net Income definition

$$Revenues - Expenses = Net\ Income \tag{1.2}$$

This is the equation that identifies a business's performance **over a period/interval of time**. **Revenues** are the **value/benefits earned** when the company **sells** products

or services to customers (often, but not always, for cash). **Expenses** are the **costs incurred in doing so**. The **difference** between those two over any period of time is the company's **net income** over that period. (If that value is negative, we might call it a 'net loss.') This is usually what people are talking about in every day speech when they say '**profit**.' But, in accounting, we use the more term, 'net income.'

The net income equation and the accounting equation are **intimately linked**. Your revenues are the benefits you earned this period—and your assets are the total benefits you control right now. Your expenses are the costs you incurred and resources you expended—and your liabilities are the total obligations you have outstanding at a point in time. So, for now, it might make *vague* sense that the two are linked. In a few weeks, you'll understand *exactly* how.

1.6.3 Dividends: A special, important category

Dividends are conceptually important and potentially tricky for first-time learners. Recall that investors (or 'owners'/ 'stockholders'/ 'shareholders') put their money into a business in the hopes of getting a return on that investment. When a business **pays out cash to those investors**, it's called a 'dividend.' Investors love getting dividends (this is how they make their money). But it's a special kind of transaction.

If a company spends cash on rent, that's an expense that helps it stay in business and generate revenue. If a company spends cash on a major new investment, like a new plant, that's an asset that continues to provide value for the company. But when a business pays a dividend, it simply moves cash from its own bank account into the bank account of the owner. Thus why it's called a 'distribution.'

This is **not a bad thing**—far from it. The promise of getting paid is the major reason investors (and entrepreneurs) invest in the first place. Value is not being destroyed or lost—just **moved from the business's bank account to the investors'**. But it does mean that dividend distributions are a special kind of activity, that get some special treatment and can confuse first-time learners. In particular, many students are tempted to think that dividends are an expense. They are **not an expense**: they are not a cost incurred in doing business. Net income is supposed to measure the value generated for shareholders. When firms move cash from their bank account to their shareholders', that *doesn't* decrease the value that was generated for them—just distributes it.

1.6.4 Retained Earnings Identity

This brings us to to the final **core identity** of accounting, and one which links the previous two. We said that the **profits** earned by shareholders/owners are called 'Net Income,' and firms pay **dividends** to those shareholders. But corporations generally do

not **pay out** the full amount of their profits **right away**. They may instead **retain** them in the corporation, in order to **invest** (that is, acquire more assets and resources) and earn more profits in the future.

In accounting, we call the **difference** between what shareholders have earned in total **(over all periods)**, and what has been paid out in total **'Retained Earnings.'**

$$Retained\ Earnings = Total\ N.I.\ Earned - Total\ Dividends\ Paid \tag{1.3}$$

This identity is **extremely important**. It is the **key link** between **financial performance** (over a period) and **financial position** (as of the end of the period). The firm's **Total Retained Earnings** are a **component of Shareholders' Equity**. One way to understand this is that the shareholders **could have claimed** all of those profits for themselves. So, whatever they **have not claimed**—it is **as if** they have contributed that in additional **financing**. And it crucially links together the **'flow measures'** in the Net Income Equation, to the **'stock measures'** in the Accounting Equation ($A = L + E$). Whatever net income (flow) has been earned and retained in a period **"lives on"** in the 'stock' measure of value (Shareholders' Equity) via Retained Earnings.

It's often useful to re-write this identity in terms of the *changes* between periods...:

$$\Delta Retained\ Earnings = Net\ Income - Dividends \tag{1.4}$$

So, e.g., if the firm had reported $100 in Retained Earnings at the **end of Fiscal Year 2019**, and earned $60 in Net Income and paid out $40 in Dividends **over Fiscal Year 2020**—then, it would report $120 in Retained Earnings at the end of **Fiscal Year 2020**.

In the **Bathtub Metaphor**, the 'flow' of water from the faucet is **Net Income**. Whatever is scooped out is **Dividends**. And so the 'stock' level of water (Shareholders' Equity) **increases by the difference.**

1.7 Periodic Reporting

There's one more concept we need in order to understand how these **core identities** and concepts link to the actual **Financial Statements**: Firms engage in activities **continuously in time** (of course!), but they necessarily report their Financial Statements on a **discrete**, **periodic** basis. You've likely heard the term 'Fiscal Year.' It's common for firms to report (that is, create and disclose) their Financial Statements on an annual basis. Such firms would report their financial statements **as of** the end of the fiscal year (e.g., December 31st for firms which align their **Fiscal Year** with the **Calendar Year**,

and any other date for those which do not).[7]

This may seem obvious (*of course* the company's accounts must be *as of some date*—how could it be otherwise?). But this is important for understanding some of the **"mechanics" of the financial reporting process**, and it can trip us up if we forget it. Here are some things to keep in mind on the **periodic nature of financial reporting**:

- Revenues and expenses are, we said above, measured **over a period**. If my company earned $50k in revenue in its first year, Fiscal Year (FY) 2020, then none of those revenues will "carry over" into FY 2021. They're set back to zero for the start of FY 2021. That doesn't mean they go away! They're just reported in FY 2020, and not in FY 2021. (And remember that they 'live on' in Retained Earnings.) Some textbooks refer to Revenue and Expense accounts as **"temporary accounts"**—because they are measured *over* a period, and zeroed out at the end—as opposed to the **"permanent accounts"** of assets and liabilities, e.g. *Land*, *Equipment*, etc.

- Consider the following: Suppose that you paid $100k for a 2-year real-estate rental contract (a lease) *in the middle of* FY 2020. What is the *expense* you would record for that rent in FY 2020 (given that you would only have "used up" one quarter of it as of that point)? We will answer this next chapter. For now, the point is: The **discrete, periodic** nature of reporting matters for things like these.

- Most generally, this means that companies don't really "*have*" Financial Statements *at a particular point in time*. At any **point in time**, they **track "accounts"** (e.g., Cash, Equipment, Revenue, etc.) And those accounts will be used to populate the financial statements at the end of the period, via the **mechanics of the reporting process**.

- In order for the financial statements to sync up, it's important we **update the Retained Earnings** balance (according to the core identity: $\Delta Retained\ Earnings = Net\ Income - Dividends$) right at the **end of the reporting period**, and **only** then. You'll eventually see how this keeps everything in sync.

1.8 Tour of the Financial Statements

Now it's time to get a bit more concrete. Let's talk about the actual financial statements that accountants produce and audit, and thus make it into the firm's financial reports. Unsurprisingly, there will be a close relationship between the core principles and identities we discussed above, and each statement.

[7] Firms can also report on a quarterly basis, and frequently have a fiscal year that *does not* align with the calendar year (i.e., ending on some date other than December 31). For the purpose of this intro course, where I focus on communicating the main accounting ideas in the cleanest way possible, most of my example problems will assume annual reporting and a December 31 fiscal year end-date.

There are **four financial statements**.

1. the Balance Sheet (B.S.),
2. the Income Statement (I.S.),
3. the Statement of Shareholders' Equity (S.S.E.) and
4. the Statement of Cash Flows (S.C.F.)

The Balance Sheet and Income Statement are the most important financial statements, in this class and in the outside world, and they illustrate the most important accounting concepts. In the 24 lectures of this class, we'll spend only one on the Statement of Shareholders' Equity, and two on the Statement of Cash Flows. You'll have to know and understand the S.S.E and S.C.F. by the end, but I want to be clear about what to focus the most attention on now.

1.9 The Balance Sheet

The **Balance Sheet** is the statement of the company's financial **position** at a **point in time** (rather than its activities *over* a period). It's like the 'stock' measure (measuring the level of water) in the bathtub metaphor. It is governed by The Accounting Equation: $Assets = Liabilities + Shareholders' \ Equity$.

In a reductive sense, the Balance Sheet is just a **list**: A list of the Assets (resources), Liabilities (obligations), and, Shareholders' Equity accounts, that a company has, as of the end of the reporting period. The **left** side tabulates the **Assets** of the corporation (typically listed in order of **liquidity**—how quickly they could be converted into cash). **Assets** include things you would expect, like **Cash** in the bank, **Equipment**, and **Land**; but also some other less obvious kinds of benefits controlled by the business, such as '**Accounts Receivable**' (which are **promises** from customers to pay later).

The **right** side of the balance sheets shows how those resources are **financed and claimed**—i.e., the **Liabilities and Shareholders' Equity** of the corporation. **Liabilities** are obligations the company has to meet that will incur an economic cost—they include obvious things like **Debt** (provided by creditors/lender) but also things like **'Salaries Payable'** (money owed to employees for work they have completed), etc.

The **difference** between the total Assets (the resources of the company) and its total Liabilities (the claims of creditors and other obligations it has) is the **Total Shareholders' Equity**. And Total Shareholders' Equity, we said above, can come from two sources: (1.) Amounts that shareholders/stockholders have directly *paid in* as investments (**Common Stock**); (2.) Profits that they *could have* paid out to themselves as dividends, but instead *retained* in the corporation (**Retained Earnings**).

A super-simple Balance Sheet could look something like this...:

Balance Sheet as of December 31, 2020

Assets	**Liabilities**
Cash: $20	Salaries payable: $30
Accounts receivable: $40	Long term debt: $120
Supplies: $80	**Total Liabilities: $150**
Equipment: $100	
	Shareholder's Equity:
	Common stock: $60
	Retained earnings: $30
	Total Shareholders' Equity: $90
Total Assets: $240	**Total Liabilities and S.E.: $240**

Remember the discussion above of the **two ways to see** The Accounting Equation ($A = L + E$): **(1.) How** the resources of the corporation were **financed** ($L + E = A$); **(2.)** What value is **left over** for the shareholders ($E = A - L$). These are important, key intuitions for *thinking about* what the Balance Sheet is telling us. But they aren't *perfectly* true, and this imprecision can be frustrating for first-time accounting students. The reason has to do with the second major general principle that governs the balance sheet. The balance sheet is intended to be **conservative**.

1.9.1 Balance Sheet: Key Principles

In accounting, **conservatism** is a general principle that constrains firms to **err on the side of understating the value of their assets** when that value is uncertain. The purpose is to restrain managers who may be tempted to 'cook the books' by overstating the value of their assets when they have discretion. There are two major implications of accounting conservatism:

- **First**, some **economic assets** are **not** recognized as **accounting assets**. E.g., part of the value of a company may come from **customers' brand loyalty**, or from the value of its Research & Development (**R&D**) in progress. But standard setters in the U.S. have decided that the value of these are too difficult to ascertain and verify. Therefore, firms are not allowed to measure and report these as assets on the Balance Sheet. (And this is controversial and debated.)

- **Second**, assets are by default recorded 'on the books' at their **historical cost** (purchase price) rather than their **true current economic value** (sometimes referred to as 'fair market value'). E.g., if a company buys Land for a price in 2019, and the

value of Land in that region increased dramatically in 2020, it may not be able recognize that increase in value on the Balance Sheet. However, if the value of that real-estate were to *decrease*, accounting standards could require it to recognize a loss.[8] Isn't this asymmetric, inconsistent? Yes, it is! And that makes it controversial. Or, as another example, if a firm buys a machine from another company for $100k, but manages the machine so well that it doubles its productivity—it cannot 'write the asset up' to $200k on the books. We generally defer to the **'verifiable' purchase price** in measuring the value of assets in accounting.

For these reasons, the value of a company's 'real' 'economic' assets will **usually be understated** in the financial statements. This is why a **corporate acquirer** will typically pay more than the net '**book value**' (that is, the accounting value of Shareholders' Equity) of a firm to acquire ownership. And this is why the **market value of equity** (i.e., the value of all the shares of a company, traded on exchanges like the NYSE) is usually higher than the book value. This tension seems weird at first, but we all get used to it.

1.10 The Income Statement

The **Income Statement** seeks to measure and represent a business's **performance** over a particular **period**. It is governed by the 'Net Income Equation' discussed above. It starts with the proverbial '**top line**' of the **Revenues** earned in that period (often referred to more colloquially as 'sales'), subtracts all of the various categories of **Expenses** (such as rent expense, salaries expense, interest expense, etc.), and then arrives at the proverbial '**bottom line**' of **Net Income**. These revenues and expenses are **intimately linked** to the assets and liabilities on the Balance Sheet. You could define a revenue as an increase in the company's assets (or decrease in its liabilities) generated from its operations—selling goods or services to customers—and an expense as roughly the opposite.

A super-simple Income Statement could look like this...:

Income Statement for the Fiscal Year Ending Dec. 31 2020

Total Revenues	$100
Salaries Expense	($40)
Depreciation Expense	($30)
Interest Expense	($10)
Net Income	**$20**

[8] Accounting standards are changing and evolving all the time, and, these days, some assets can be recognized at 'fair value,' while others are still recorded at historical cost. These changes will continue during your career, and can make life challenging—i.e. interesting—for the financial analyst.

(Note that, in accounting, by convention, parentheses indicate negative or subtracted amounts.) You might be tempted to assume that 'revenue' is just a fancy word for the total cash the company collected, that 'expense' is just a fancy word for the cash the company spent. But this is **not correct**. Such a system, which tracks inflows and outflows of cash, is called **cash accounting**. But U.S. and global accounting systems have evolved over many centuries to use a system of **accrual accounting**.

The income statement's accrual accounting differs from cash accounting in two primary ways: **Revenue Recognition** and **Expense Matching**.

1.10.1 Accrual Accounting Revenue Recognition

Under accrual accounting, revenues are *recognized* not when cash is received from customers, but when it has been **earned**. So, e.g., when a **wholesaler** sells goods to its business customers of good reputation on **trade credit** (i.e., their promise—based on their *credibility*—to pay later), it would recognize those **sales** as **Revenues** after **delivering the goods**, even if the retailers would **not pay the cash** for several months.

Why do we do it this way? There are two reasons: **First**, financial-statement users (such as investors) may want the information they receive to be **timely**. **Second,** accounting tries to measure the profitability of the company's ongoing **activities and operations**, irrespective of the **timing** of the arrival of **checks in the mail**.

- **Revenue recognition thought experiment**: Suppose that our company delivers a huge batch of product to WalMart on December 18. But, then, **two quantum universes diverge**. In one universe, the check from WalMart arrives at our headquarters on December 30. In the other universe, there's a huge **snowstorm**, that delays the arrival of the check until January 2 of the next calendar year. Should our company's profit for the year really be different in those two universes, depending on how a random weather event affects the mail, if we are trying to measure the profitability of the company's real *activities*?

If our company delivers a huge shipment of product to WalMart, the value of shareholders' ownership has already increased on that basis—our investors may wish to **know** about that fact **sooner**, during the next financial report, rather than **wait** until the end of the period in which the **cash is delivered**.

1.10.2 Accrual Accounting Expense Matching

The second major difference is that, under accrual accounting, **expenses are, when practicable, matched to the corresponding revenues** that they helped to generate—that is, recorded as expenses **in the same reporting period**.

An example of this is the **accounting "depreciation"** of investments. Suppose that we buy a new **Plant** in order to manufacture shirts that we will sell over the next ten years. In this case, we would not recognize the entire cost of purchasing the plant as an *expense* in this year—instead, we would attempt to match that expenditure to the revenues, by **apportioning the cost over the 10 years** over which we will use the plant. In accounting, that **apportionment** is called **'Depreciation expense.'**

Here's the flip side of that, though: *Because* we want to *apportion* that expense over those 10 years, we don't record the expenditure on the **Plant** as an *expense* right away. But, we must record that transaction, and *account for* what we spent that money on, and what we got in return. What gives? The answer is that when we *first* buy that **Plant**, we record it as an **Asset** (reported on the Balance Sheet). And then, later on, as we use it, over multiple periods, we'll record *Depreciation Expenses*. This is a core insight, and a deep link between the Balance Sheet and Income Statements. Generally, **Assets become expenses—get expensed out—*later*.**

- **Expense matching thought experiment**: Suppose our company spends $100k dollars to buy a plant that will produce goods over the next ten years. It doesn't seem correct to say that we 'lost' $100k that year—instead, it's more like we are **investing** now to gain more later. Similarly, if, over the next ten years, we were to earn only $5k per year in Revenues from the sale of goods made in that plant (after an initial investment of $100k), such that we lost $50k on net overall, it wouldn't seem correct to say it was 'profitable' in all those subsequent years. It seems intuitive to measure profitability in a way that **matches expenditures on resources to the periods in which those investments pay off.**

1.10.3 Accrual Accounting Purpose

Why does accrual accounting do things this way? It's trying to measure the profitability of a company's real ***activities*** on an ongoing basis. The Income Statement gives a **'flow'** measure of the value generated for owners/shareholders from a company's real **activities/operations over the period**. And, it recognizes revenues and expenses in the **period** in which the **activities occur** rather than that in which the **cash changes hands / checks arrive in the mail**.

1.10.4 Income Statement and Balance Sheet: Bathtub Metaphor

It's common to illustrate the differences and linkages between the Income Statement and the Balance Sheet, by comparing a company to a **bathtub**. The Income Statement is like a **'flow'** measure of the rate at which water is being added to the tub (which in turn is a function of how much is flowing in from the faucet [Revenues] vs. how much

is leaking out elsewhere [Expenses]). And the Balance Sheet is a **'stock'** measure of the total **level** of water in the bathtub, which, in turn, is the ***cumulation*** of everything that has flowed in (and not leaked out) to date.

Extending the metaphor further, we could say that water that is **scooped** from the bathtub and poured into the sink is like **dividends** paid out to shareholders. Dividends decrease the Shareholders' Equity as reported on the B.S. and S.S.E., but they don't destroy value—they just scoop it from the company's bank account to the shareholders'.

1.11 Statement of Shareholders' Equity

This statement is the simplest, has the least information, and is the one that investors pay the least attention to. Its distinctive focus is on tracking the business's transactions and standing with its own owners/shareholders. That is, it's all about **Shareholders' Equity (E)**. And there are fewer transactions—of less complexity—that a business makes with its owners/shareholders, than all the others tracked in the other statements. This statement is fairly intuitive, but presented in a different format than the others. Instead of listing **accounts** on the vertical axis (as in the Income Statement and Balance Sheet above), it instead lists particular transactions and items on the vertical axis, and tracks how those affected the Shareholders' Equity accounts on the horizontal axis. That is, it explicitly shows the *changes* in the accounts, and their drivers. A simple Statement of Shareholders' Equity (SSE) could look like this:

	Common Stock	Retained Earnings	Total Shareholders' Equity
Balance, Jan 1, 2020	$0	$0	$0
Issue Common Stock (Tr. #1)	15,000		15,000
Total Dividends Paid		(100)	(100)
Net Income		2,300	2,300
Balance, Dec 31, 2020	**$15,000**	**$2,200**	**$17,200**

Table 1.1: Statement of Shareholders' Equity

For today's purposes, the important thing about this statement is how it helps to illustrate the **link** between the Income Statement and Balance Sheet. This statement is governed by two key equations:

$$Shareholders' \ Equity = Common \ Stock + Retained \ Earnings \tag{1.5}$$

This equation says that **E** comes from **two sources**: (1.) **'Common stock'** is the cash that investors directly paid in when they initially bought their shares of ownership

(stock) from the business. It's often called **'paid-in capital.'** (2.) **'Retained earnings'** is the amount of profits that have been *earned*, but which the owners did *not* pay out to themselves, and instead *retained*. It's often called **'earned capital.'**

So, this third financial statement is based on the third **core identity**:

$$Retained\ Earnings = Total\ NI\ Earned - Total\ Dividends\ paid\ out \tag{1.6}$$

Retained earnings is cumulative sum of whatever profit the company has earned over its entire history, less whatever it has paid out as dividends—in other words, the total amount that it has *retained*. Combining these two equations, we can see that:

$$Shareholders' Equity = Common\ Stock + Total\ NI\ Earned - Total\ Dividends\ paid \tag{1.7}$$

This is ***the link*** between...

- the world of the Balance Sheet:
  - $A = L + E$, **stock measures, permanent accounts, at a point in time**
- and the world of the Income Statement:
  - $R - E = NI$, **flow measures, temporary accounts, measured over a period**

The income-statement measures **"live on" in Retained Earnings**, which is a part of Shareholders' Equity, on the Balance Sheet. And the Statement of Shareholders' Equity illustrates this. It reports the Net Income earned, the Dividends paid out, and thus the *change* in Retained Earnings; it also reports all of the company's transactions with its owners/shareholders, including the Common Stock investments. Summing the two provides the updated Shareholders' Equity **(E)** reported on the Balance Sheet.

1.12 The Cash Flow Statement

The **Cash Flow Statement** reports the company's performance over the period, using (essentially) **cash-basis accounting** instead of **accrual-accounting** principles. It simply tracks how much **cash** the company **expended** and **received** on various different things. Importantly, it divides those cash flows into **three categories**: Cash flows from **Operating Activities**, **Investing Activities**, and **Financing Activities**. And it reports the net change in cash *within* each category of activity, and on net.

So, they'll all have roughly this basic structure:

Operating cash flows...:		
...		$...
...	$(...)	
Net Change in Cash From Operations		**$X**
Investing cash flows..:		
...		$...
...	$(...)	
Net Change in Cash From Investing	**$(Y)**	
Financing cash flows..:		
...		$...
...	$(...)	
Net Change in Cash From Financing		**$Z**
Net Change in Cash Between Periods		**$X-Y+Z**

Table 1.2: Statement of Cash Flows, for FY ending 12/31/2020

We need to learn *a lot* more accounting before we can learn exactly how the Cash Flow Statement works, what goes into those ellipses (...) above. For now, let's just talk about two more general things, that will come up in the interim: (1.) **The categories** (operating vs. investing vs. financing activities), (2) **Why** financial-statement users would be interested in the cash-flow statement.

1.12.1 Categories of Transactions: Operating, Investing, Financing

- **Operating Activities** are transactions having to do with a firm's normal day-to-day activities and core business. These include things like **making sales of goods or services** to customers, **paying salaries and utilities**, etc.

- **Investing Activities** are transactions having to do with the purchase and sale of **long-term Assets**—resources that will pay off over multiple periods. This would include the purchase and sale of **Plant, Property, & Equipment**. And, if a company were to purchase or sell a *different* company's stocks or bonds, as an **Investment**, that would be an Investing activity as well.

- **Financing Activities** are transactions having to do with how the company **finances *itself***—i.e., its transactions with its own **financial creditors and investors**. So, paying out **Dividends**, or getting extra cash from new investors (Common Stock) or from a new **loan**—these would all fall in the *financing* category.

These will show up elsewhere in the course, everyday speech and business news.

1.12.2 Why the Cash Flow Statement?

What's the point of the Cash Flow Statement? Didn't we just make an argument for the principles of **accrual accounting**, as opposed to **cash basis accounting**, above? There are good, logical reasons for accrual accounting, and some real benefits. But there are also some downsides and potential problems. So, the Cash Flow Statement provides some incrementally useful information. In particular, it helps: (1.) As a **"check"** on potential abuses and manipulation of accrual accounting, (2.) To understand a company's **cash liquidity**, its ability to pay what it owes in cash.

- **(1.) Check on gimmicks:** Accrual accounting involves some unverifiable estimates and forecasts that can be abused. For example, we learned above that companies **record revenue** when they ship goods to **customers**, rather than when the check arrives in the mail. There's a reason for that. But what if a company started aggressively shipping product to customers who were never likely to actually pay, in order to boost reported revenues? Clearly, that doesn't sound like a good idea. As the course progresses, we'll see several other examples of cases in which accrual-accounting principles can allow firms to boost their *reported* profitability, even though the underlying economics is not improving.

  The cash flow statement doesn't depend on these accounting choices. It more closely tracks cash receipts. Thus, if you notice that a company's **Net Income** were increasing, while its **Cash Flows from Operations** were decreasing, that could be a **red flag**. It *could* indicate that the company's management is using accounting 'gimmicks' to make the company appear to be doing better than it really is.

- **(2.) Cash liquidity / 'Cash is King':** Companies have to **pay the bank**—that is, pay their contractually obligated **interest and principal** to their creditors—in **cash**. Otherwise, their creditors can seize collateral, take them to court, etc. And, in principle, a company *could be* highly profitable in terms of accrual **Net Income**, but **not** have enough **cash on hand and/or coming in** to pay its debts in cash. This could happen if, for example, the company was making all of its sales to customers *on credit*—and not collecting cash from them. Or if the company was investing heavily in building up its *Inventory* (an asset), but not selling much of it. Such companies can be **profitable** but not **liquid**—i.e., not able to convert their value to cash to make due on payments. For these reasons, a company's **cash flow performance** is very important to creditors and managers.

1.13 Other information

The focus of this course is the four **Financial Statements**. But these are **not the totality** of the information that firms disclose. Firms are also required to, and voluntarily choose to, disclose plenty of other information as well—things that may be important to various stakeholders, but cannot be reliably quantified in the Financial Statements. Examples include: the management's *ideas* and *plans* for its **strategy**; and certain **long-term risks** that are **not quite quantifiable** as liabilities. These can be discussed verbally or qualitatively in the firm's annual reports (such as the **management discussion and analysis (MD&A)** section, or discussed on conference calls with analysts. While this 'other information' is, by definition, not part of the Financial Statements, it is an important part of the firm's "information environment"—the process by which it delivers useful information to the stakeholders who need it.

1.14 Says who? Standard setters, regulators, auditors

So, we've sketched out the major principles of accounting, and how they are used to produce the financial statements. But...**says who?** Who has the authority to say that firms must report those Financial Statements according to those principles, and why? There are two major standard-setting bodies and systems we'll talk about: U.S. GAAP standards, issued by the FASB, and international IFRS standards, issued by the IASB.

1.14.1 GAAP

In the U.S., **The Financial Accounting Standards Board (FASB)** issues and regulates U.S. **"Generally Accepted Accounting Principles" (GAAP)**. These are the accounting standards all publicly-traded U.S. companies are required to report under—and many non-U.S. companies voluntarily do as well, in order to attract U.S. investors. The accounting profession and practices had evolved for many centuries prior. But in **1933**, after the great stock market crash and subsequent beginning of the Great Depression, the U.S. Congress created the **Securities and Exchange Commission (SEC)**, and empowered it to regulate the disclosures of publicly-traded corporations, in an effort to protect investors. The SEC has since **delegated** the task of setting common accounting standards for such corporations to the FASB, which is a private self-regulating body, based in Norwalk, CT, and run by experts and leaders in the accounting professions.

1.14.2 IFRS

Globally, non-U.S. developed and developing countries have largely adopted a uniform set of accounting standards, called **International Financial Reporting Stan-**

dards (IFRS), which are issued by an international NGO, the **International Accounting Standards Board (IASB)**. This body was developed in response to the rapid globalization of the late 20th and early 21st century. Financial statements users increasingly wanted common, comparable standards if they wished to transact with and invest in companies from, e.g., Italy to Germany to Japan, etc. Prior to this, most large countries had their own country-specific accounting standards.

1.14.3 Convergence

Years ago, there was hope and some promises that the U.S. FASB and the international IASB would shortly "**converge**," and adopt a **common set of standards** for both U.S. and international companies. Such hopes have since fizzled out, and now there is little hope that we'll have one truly global set of accounting standards in the near future. As such, this class will mostly focus on U.S. GAAP. But most of the core accounting principles we'll cover in this class are shared across the two systems. Of what we've discussed so far, there is only one exception: IFRS allows firms to record some of their R&D as an Asset (i.e., 'capitalize' it). More broadly, **IFRS** are often described as more **'principles based,'** while **U.S. GAAP** standards are seen as more **'rules based'** in the details of accounting for particular transactions.

1.14.4 Auditors

While the **standard setters** (FASB / IASB) are the ones who **make** the rules, **auditors** are the accounting professionals who independently check and **verify** that businesses are actually obeying those rules, and correctly reporting their Financial Statements. These auditors will do everything from verifying that the business used an acceptable **method** in calculating its depreciation, and calculated it correctly; to verifying in person, via random checks, that it actually has the amount of Inventory it claims. These auditors have an **extraordinarily valuable** role to play in ensuring that companies are not 'cooking the books'—and that investors can rely upon and trust the claims that companies make in their Financial Statements. But there have been some extraordinary failures (such as, e.g., the Enron-Arthur Andersen debacle).

Audit is a separate course of study, and we will not cover it in this Financial Accounting class. But for now, just pause and appreciate what a profound question it is at its core: **How do we really know** that large institutions have actually done the things that they **claim** they have done? That the events they attest to have have happened **really happened?** That they really **have** the resources they claim? Think about this in the context of major organization failures during the pandemic and other recent events. It's a deep question, and one we typically take for granted—often to our detriment.

2

Accounting for External Transactions

Chapter 1 was a high-level, conceptual overview. In this chapter, we'll take a more practical approach, and start doing some simple accounting. We'll **account for** 10 basic **transactions** using the **Accounting Equation** ($A = L + E$).

For now, we'll only account for a company's **"external transactions" during the reporting period**—i.e., the "real" exchanges of things or services between the company and some outside party, at the **exact moment of the exchange**. These are in contrast to "adjusting entries" or "internal transactions" at the *end of the reporting period*, which we will cover in subsequent chapters.

As a concrete example, suppose that our company pays for a 2-year lease on a building up front, halfway through the annual reporting period. The day the company pays for the lease, that is a "real" exchange—an external transaction. And the company receives, in return, a resource that it will use for multiple reporting periods—the ability to use the building for 2 years. So, in the moment of the exchange, it pays out cash, and receives an **asset**, which we happen to call **Prepaid Rent**.

Later on (Chapter 4), as the company "uses up" the lease, it will need to account for the **expense from using up the asset**—in this case, called *Rent Expense*. But there will be no "real" moment of exchange that will trigger that. Hence, we will account for that at the end of the reporting period, as an "adjusting entry" or "internal transaction." This distinction will become much clearer over time. For now, in this chapter, we are accounting only for what happens at the **exact moment of the transaction**.

There are four things we need to keep in mind before we begin.

- **First**, remember that **the Accounting Equation (A = L + E) is an identity**—the two sides must always add up. Any transaction that affects one part of the equation must have a second effect that keeps the two sides in balance.

- **Second**, this is the equation that governs the Balance Sheet. But, as we discussed in Chapter 1, the Balance Sheet and Income Statement are intimately linked. So, we will see some Revenues and Expenses, and we'll account for them as eventual **contributors to** Shareholders' Equity, based on the **Retained Earnings Identity** from last chapter ($\Delta Retained\ Earnings = Net\ Income - Dividends$).

- **Third**, we must define what we mean by an **'Account.'** An 'Account' has a commonsense meaning: It's a category for tracking changes in one type of resource or obligation. So, e.g., a company can have a **Cash** account (tracking the cash money it has in the bank) and an **Equipment** account (tabulating the value of the equipment it owns). Firms have some **discretion** over precisely how they **divide up the world**—i.e., what accounts they keep, which they call their '**Chart of Accounts.'** But there is also lots of similarity across firms, and strong conventions. We'll get familiar with the major categories in use over time.

- **Fourth**, remember the definitions of assets and liabilities. The Financial Accounting Standards Board (FASB), which sets Generally Accepted Accounting Principals (**GAAP**) in the United States, uses the following definitions.

  - **Assets**: "Probable future economic benefits obtained or controlled by a particular entity as the result of past transactions or events."
  - **Liabilities**: "Probable future sacrifices of economic benefits arising from present obligations of a particular entity to transfer assets or provide services to other entities in the future as a result of past transactions or events."

The 10 transactions that we'll account for are:

1. Sell Shares of Common Stock for $15,000
2. Borrow $5,000 from the bank
3. Purchase equipment for $10,000
4. Pay $2,400 for two years of rent, up front
5. Purchase supplies 'on account' (that is, with promise to pay cash later) for $1,000
6. Provide soccer training to customers for $3,900 in cash

7. Provide soccer training to customers 'on account' (that is, with them promising to pay later) for $3,100

8. Receive cash payment in advance/up-front for future training, $800

9. Pay salaries to employees, $1,800

10. Pay cash dividends of $100 to shareholders.

2.1 Transaction 1: Sell Shares of Stock for $15k

This transaction is the original (**OG**) transaction in the life of the firm, in the "simple model of a business" discussed in Chapter 1. The first owner puts in their own money to finance the enterprise. And as additional investors put in more money (e.g., Shark Tank), they also become owners, receiving *shares*. In these cases, we say that the company has '**sold common stock**'—it has disbursed a legal contract (shares of ownership) and received cash in exchange.

How to account for this? **Start with cash**. The company receives a cash inflow of $15k. **Cash** is obviously an economic resource controlled by the firm. So that is an **Asset** under the FASB definition. But the accounting equation must stay in balance. What else happens? Since this cash is a direct contribution from investors, **Shareholders' Equity (SE)** must increase ($A \uparrow$, $E \uparrow$). So, it would look like this:

Transaction	Assets	Liabilities	Shareholders' Equity
#1: Sell $15k of Common Stock	+$15k (Cash)		+$15k (Common Stock)

2.1.1 Takeaways

Even this simple transaction yields important, deep insights. The key **takeaway** from this transaction, the **weird thing** you need to wrap your mind around, is **the nature of double-entry bookkeeping**. Note that the company, at this point in time only **has one thing**—$15k in cash. (It *does not **have*** $30k of anything, even though the two accounts add up to that.) But we **account for that one thing in two ways**. This is what "double-entry bookkeeping" means. The left side of the accounting equation (A) tells you what the company *has*; and the right side ($L+E$) tells you how that thing was *financed*. This is a profound and deep insight, and even very senior, highly-remunerated financial professionals make mistakes because they haven't fully internalized this distinction. See, e.g., Prof. Anat Admati's "The Bankers' New Clothes."

2.2 Transaction 2: Borrow $5k cash from the bank

This transaction probably seems more familiar: A company getting a loan from a bank. How to account for this? **Start with Cash**. Clearly, Cash, an asset, goes up by $5k. How does the accounting equation in balance? The **bank is a creditor**, because the loan has to be paid back, so it is a **Liability** for the company ($A \uparrow$, $L \uparrow$). Now, here's a bit of **jargon** we just need to know: We use the somewhat antique-sounding term **"Notes Payable"** for this liability account. You can remember it this way: 'Notes Payable' are *bank notes* that you are *obligated to pay* off (a 'payable').[1] So, we account for it like so:

Transaction	Assets	Liabilities	Shareholders' Equity
#1: Sell Common Stock	+$15k (Cash)		+$15k (Common Stck)
#2: Borrow from bank	+$5k (Cash)	+$5k (Note payable)	

Note that, in the table above, we **separately account** for the **incremental effect** of each transaction on its own. So, the $5k in cash on the books from Transaction #1 has no effect on how we account for the $15k in cash in Transaction #2. We're accounting for the *impact* of each transaction separately. But we could also, if we wanted, *combine* those two transactions, to get the the total balance for each account, like so:

Transaction	Assets	Liabilities	Shareholders' Equity
#1 & #2 Aggregated	$20k (Cash)	$5k (Note Payable)	$15k (Common Stock)

Obviously, these are just two different ways of organizing the same information. But this distinction—between the ***incremental effect* of transactions vs. *aggregate balances***—can trip students up as things get more complex.

2.2.1 Takeaways

The key **takeaway** from this transaction, the **weird thing** you need to wrap your mind around, is **how to see The Accounting Equation**. Recall that last chapter, we talked about the two ways to see it:

- (1.) The **"Sources of Financing"** view ($L+E=A$): The company *has* $20k in cash ($A$). And that cash had to come from somewhere. The L and E accounts tell us how much of it *was provided* by creditors vs. equity investors, respectively.

[1] In general, there will be several accounts referred to as "payables," and they will all be liabilities, since they represent amounts the firm *has to pay to others*. These will be in direct contrast to "receivables." Those are amounts the company is entitled to receive from others, which are thus assets.

- (2.) The **"What's Left Over"** view ($E = A - L$): The company *has* $20k in cash. But it has a legal obligation to pay the bank back the $5k loan from the bank. So, if it does that, it will have $15k left over, which can be claimed by the **equity owners**.

2.3 Transaction 3: Purchase Equipment for $10k in Cash

So now, the firm has cash financing. Step 2 in the "simple model of a business" from Chapter 1 is to **acquire resources** that it will use to do its business.

The company buys **Equipment** for $10k in **Cash**. How to account for this? Let's make it easy for ourselves and **start with cash**: That's an asset, and it goes down by $10k. Next, how does the accounting equation stay in balance? In exchange for the cash, the company got **Equipment**—this is a *resource* that the company now *owns* and will use for its benefit for many periods. That means that it is an *asset*. So, this time, the change in one asset account is balanced by a change in another asset account ($A \uparrow$, $A \downarrow$). In other words, the transaction transfers value from one asset account to a different asset account.

Transaction	Assets	Liabilities	Sh.'s Equity
#1: Sell $15k of Common Stock	+$15k (Cash)		+$15k (C.S.)
#2: Borrow $5k from the bank	+$5k (Cash)	+$5k (N.P.)	
#3: Purchase equipment for $10k	-$10k (Cash) + $10k (Equipment)		

And our **balance** (i.e., adding this transaction to the last balance) looks like this:

Transaction	Assets	Liabilities	Sh.'s Equity
#1, #2, & #3 aggregated	$10k (Cash), $10k (Equipment)	$5k (N.P.)	$15k (C.S.)

How do we know that the Equipment is **truly worth $10k**? That's a tricky and in some ways philosophical question. (Indeed, arguably, the firm should only pay $10k for the equipment if it thinks that it will be worth more than $10k to the firm. If you buy something for $100 in cash, then that means you preferred that thing to your $100 in cash—or in other words, that that thing was worth more than $100 to you.) So, the short answer is: **We don't** know what it's truly worth.

This is where accounting principles such as **verifiability, conservatism,** and the **monetary unit assumption** come into play. We need to **'convert'** all the company's various real resources into some **monetary unit**—dollars. And we can't just let the

managers **say** that the resource is worth **whatever they want to say**. So, in accounting, we, by default, initially base asset measurements on the **purchase price** (often phrased as "historical cost"), based on a **verifiable receipt**, rather than more subjective estimates. The assumption is that if the firm bought that equipment in an **arms-length transaction** in a fairly **competitive market**, then the transaction price is the best available estimate of its value. Put differently, **"in accounting, you get what you pay for."**

2.3.1 Takeaways

The two **weird things** you need to wrap your mind around, are:

- In accrual accounting, when you **spend money on something you will use over multiple periods**, that thing is **initially an Asset**. Prior to starting this class, you probably thought that when companies spend money, that's an *expense*. So, this might seem counterintuitive. And, in Chapter 4, we will see that the Equipment will **"be expensed out"** as it is used up, over time. That expense will be factored in as a part of the "adjusting entries" at the end of the reporting period. This basic pattern will hold true for *most assets*. Assets are not expenses at the moment of the external transaction—but they come to be recognized as expenses later on.

- **"In accounting, you get what you pay for."** That is, we initially record assets "on the books" at their **purchase price**. There are reasons why we do this. But this means that "accounting value" and "true economic value" are not always going to be the same thing. This seems strange at first, but we all eventually get used to it. Remember: **"The map is not the territory."**

2.4 Transaction 4: Pay two years of rent in advance, $2.4k

How to account for this? **Start with cash**. That asset account obviously goes down by $2.4k. What else happens to keep the equation in balance? In exchange for the cash, the corporation gets **control** of a new economic **benefit/resource**: The ability to use building for multiple periods. So that's an asset. We call this asset **"Prepaid Rent."**

Using the accounting equation, the transaction looks like this:

Transaction	Assets	Liabilities	Sh.'s Equity
#1: Sell $15k of Common Stock	+$15k (Cash)		+$15k (C.S.)
#2: Borrow $5k from the bank	+$5k (Cash)	+$5k (N.P.)	
#3: Purchase equipment for $10k	-$10k (Cash), +$10k (Equipment)		
#4: Pay rent up front, $2.4k	-$2.4k (Cash), +$2.4k (Prepaid Rent)		

And our **new balance** (i.e., adding this transaction to the last balance) is this:

Transaction	Assets	Liabilities	Sh.'s Equity
1 - 4 aggregated	$7.6k (Cash) $10k (Equipment) $2.4k (Prepaid Rent)	$5k (N.P.)	$15k (C.S.)

Now, it *must be true* that the Accounting Equation balances for the *aggregate account balances*, since we balanced it on each individual transaction, and the aggregate balances are just the cumulation of those. But, to reassure ourselves, we can verify:

$A = \$7.6k + \$10k + \$2.4k = \$20k$

$L + E = \$5k + \$15k = \$20k$

2.4.1 Takeaways

The two key **weird things** you need to wrap your mind around, are:

- **Abstract/intangible nature of assets:** The ***Prepaid Rent*** is not a real, physical thing like *Equipment*. Reductively, it is just **a contract**. But that contract is a resource that will bring it benefits over multiple periods, and which it now controls. So it fits the definition of an asset.

- **Assets and expenses again:** Just like last time, the company **spends money**, but it's **not an expense—*yet***. At the exact moment of the transaction, the company has acquired a resource, but not used it up. We will account for *Rent Expense* **later on**, as a part of the adjusting entries at the end of the period.

2.5 Transaction 5: Purchase Supplies for $1k "on Account"

Often, companies will buy things from their suppliers and promise to **pay cash later**. When they do this, we say that they are buying **"on account"** or **"on credit"** (that is, on

the basis of the **credibility** of their promises, or their **creditworthiness**).

Supplies are resources that are used over multiple periods, so they are assets. By now, you surely know what *would* happen if we purchased supplies using cash. But **there is no cash** in this case. What do we do? This is **still a "real" external transaction**, because there is a real **exchange** (the Supplies). How do we account for it? What balances the increase in Supplies ($A \uparrow$)?

Our company has *promised* to pay later. This means it has an *obligation*—a **Liability** ($A \uparrow$, $L \uparrow$) . When the company owed money to the bank, we called that *Notes Payable*. And, in this case, when it **owes money to a *supplier*,** we call that ***Accounts Payable***. So, we would account for this transaction like so...:

Transaction	Assets	Liabilities	S.E.
#5: Buy supplies on account	+$1k (Supplies)	+$1k (Accounts Payable)	

And our **new balance** (adding this transaction to the last balance) looks like this:

Transaction	Assets	Liabilities	Sh.'s Equity
#1-#5 aggregated	$7.6k (Cash) $10k (Equipment) $2.4k (Prepaid Rent) $1k (Supplies)	$5k (N.P.) $1k (Accounts Payable)	$15k (C.S.)

2.5.1 Takeaways

There is one **weird thing** you need to wrap your mind around here:

- **Liabilities (L) are not just owed to the bank:** Up until this transaction, the only liability that we saw was *Note Payable*, the accounting term owed for a loan from and owed to a bank. And that fit with the intuition and corporate finance material we covered in Chapter 1, where we said that all of the resources of the company were financed by equity vs. credit financing. Here, we found out that *promises to pay suppliers* are also a liability.

  Does this contradict that early model, and our understanding of the meaning of the accounting equation? Not really. Most businesspeople would think of this as a **form of credit financing, provided by our suppliers**. When our suppliers give us a good today, and allow us to pay them back later, it is **as if** they are extending a loan. Just like a bank that gives us cash today, and requires us to pay them back later. And, we **have to pay our suppliers**—otherwise, they won't continue to do

business with us. So they come **prior to our shareholders**. As such, this still fits into our framework for **how to see the accounting equation** ($E = A - L$).

Understanding Supplier Financing

Advanced Gestalt Shift: One way to understand this is to imagine that this one transaction was broken up into two parts. Suppose that your company wants to buy **Supplies**, but does not have cash on hand. Your company and the supplier could do a transaction in two steps: (1.) The supplier could give you a cash loan of $1k, which you are obligated to pay back later. (2.) And then your company could use that $1k in cash to buy the Supplies.

So, from your company's perspective, those two transactions would look like this:

Transaction	Assets	Liabilities	S.E.
Part 1: Get loan	+$1k (Cash)	+$1k (Notes Payable)	
Part 2: Buy supplies in Cash	+$1k (Supplies)		
	-$1k (Cash)		

But, since the $1k in Cash makes a **round trip** in just one day, it could be easier just to net it out, and aggregate the two transactions:

Transaction	Assets	Liabilities	S.E.
Advanced Gestalt Shift (AGS):	+$1k (Supplies)	+$1k (Payable)	

And, so, here we are, back at our original accounting for the transaction, just with the 'Payable' called a 'Note' instead of 'Accounts Payable.' So, this shows how **paying "on account"** is **just like getting a loan**.

2.6 Transaction 6: Providing Services for $3.9k in Cash

How do we account for this? **Start with Cash**. That asset account goes up by $3.9k ($A \uparrow$). How does the accounting equation stay in balance? The company does not have any new liabilities here, and no other asset is affected. So it must be that **Shareholders' Equity** goes up by $3.9k, to keep things in balance ($A \uparrow$, $E \uparrow$). But this is a bit confusing. **No new equity investors have purchased Common Stock**. So, how does E go up?

We learned in Chapter 1 that when a company **earns** money from its operations, from providing goods or services to **customers**, we call that a **Revenue**. And further, we learned a couple of **core identities,** that we must **know cold**:

$$Net\ Income = Revenue\ - Expenses$$
$$\Delta Retained\ Earnings = Net\ Income - Dividends$$
$$Shareholders'\ Equity = Common\ Stock + Retained\ Earnings$$

Interpreting those identities verbally: **Revenues increment Net Income, which increments Retained Earnings, which is a part of Shareholders' Equity**. We could rearrange each identity a bit, to make this more explicit:

$$Revenue\ - Expenses = Net\ Income$$
$$Net\ Income - Dividends = \Delta Retained\ Earnings$$
$$Retained\ Earnings + Common\ Stock = Shareholders'\ Equity$$

We also learned that **Retained Earnings** is sometimes called "Earned Capital"—amounts that shareholders have *earned* and retained—as opposed to "Paid-in Capital"—amounts that shareholders directly *Paid In* via purchasing Common Stock. So, when companies **earn Revenue**, we think of that as a **component of, or eventual contributor, to Shareholders' Equity**.

We need to be a bit careful here, though. Remember that **Revenue *per se* is never directly reported on the Balance Sheet** under Shareholders' Equity. Instead, it **eventually flows** into the **Retained Earnings** balance reported at the end of the period. As long as you keep that in mind, then, for now, you can just think of *Revenue* as a positive entry in the *Shareholders' Equity* column.

So, in short, when a company provides a service to customers (that is, **earns revenue**) in exchange for cash, we account for it like so...:

Transaction	Assets	Liabilities	Sh.'s Equity
#6: Provide training for cash	+$3.9k (Cash)		+$3.9k (Revenue)

And our **new balance** (adding this transaction to the last balance) looks like this:

Transaction	Assets	Liabilities	Sh.'s Equity
#1-#6 aggregated	$11.5k (Cash)	$5k (N.P.)	$15k (Common Stock)
	$10k (Equipment)	$1k (A.P.)	$3.9k (Revenue)
	$2.4k (Prepaid Rent)		
	$1k (Supplies)		

2.6.1 Takeaways

There are three key things you need to wrap your mind around:

- **Account for Revenues as positive entries in the Shareholders' Equity column:** Think through the **core identities**, and how **earning revenue** will eventually contribute to **Retained Earnings**, which is "earned capital." Or, just memorize.

- **Link between Income Statement and Balance Sheet:** When the company earns **Revenue**, this is balanced by an increase in **Cash**, which is an **asset** reported on the **Balance Sheet**. So, this is the first time we've seen, in concrete accounting for a transaction, what we talked about on a conceptual level in Chapter 1.[2]

- **Core concept—'Paid-in Capital vs. Earned Capital'**: This transaction helps to illustrate one of the core concepts of accounting, and business generally. Firms need *capital*—sources of cash or other resources—to do things. If our firm wants to buy an asset in cash, we need to get that cash from somewhere. Where do we get that cash? One way to get the cash is to raise it from investors, by issuing *Common Stock*, and getting **"paid-in capital."** But, **once we're up and running**, we'll also get cash and resources simply from running our business and **selling to customers**. *Revenue* is thus a source of **"earned capital."**

2.7 Transaction 7: Providing Services on Account, $3.1k

This transaction is just like the previous one except, this time, the customers don't pay in cash, and, instead, promise to **pay later**. How do we account for this? Recall from Chapter 1 that a core principle of accrual accounting is that we **recognize revenues when they have been earned**—that is, when the good or service has been provided—rather than when the check arrives in the mail. Since the service has been fully provided in this example, we recognize **Revenue** ($E \uparrow$).

How do we balance it out? The customers have promised to pay later. That is *their obligation*. From our company's perspective, we are **entitled to receive that payment** in the future, and can reasonably expect we will. So that is an **Asset** for our company. In the **jargon** of accounting, we call this asset **'Accounts Receivable.'** (A 'receivable' is just the flipside of a 'payable'—amounts we are entitled to receive from others. We will see various kinds of both receivables and payables throughout this class.)

Transaction	Assets	Liabilities	Sh.'s Equity
#7: Provide training on account	+$3.1k (Acc. Receivable)		+$3.1k (Revenue)

And our **new balance** (adding this transaction to the last balance) looks like this:

[2] This will hold in general: Every way in which a company can earn Revenue will be linked to a change in an Asset account or a liability account.

Transaction	Assets	Liabilities	Sh.'s Equity
#1-#7	\$11.5k (Cash)	\$5k (N.P.)	\$15k (Common Stock)
	\$10k (Equipment)	\$1k (Accounts Payable)	\$7k (Revenue)
	\$2.4k (Prepaid Rent)		
	\$1k (Supplies)		
	\$3.1k (Accounts Receivable)		

2.7.1 Takeaways

The two key, **weird things** you need to wrap your mind around, are:

- **Revenue Recognition:** The company here **recognizes revenue** even though it has **not yet received cash**, because it has provided the service. This is one of the two core principles of accrual accounting, which attempts to measure the profitability of the company's **activities**.
- **Link between Income Statement and Balance Sheet:** Last time, when the company earned **Revenue**, it was balanced by an increase in **Cash**, which is an **asset** reported on the **Balance Sheet**. This time, the **Revenue** is balanced by an increase in **Accounts Receivable**, which is usually the next asset listed on the Balance Sheet. So, either way that the company earns revenue that we've seen so far—whether selling for cash, or selling on account—is **linked to** the Balance Sheet via an asset account.

2.8 Transaction 8: Customers Pay Cash in Advance (\$800)

This transaction is the oddest, hardest one so far. But it will help illustrate some very core, interesting accounting principles. In this case, **customers pay \$800 cash in advance** for services that they will receive at a later period. How do we account for this? **Start with cash**. That asset account goes up by \$800 ($A \uparrow$).

What balances it? Is this a revenue? According to accrual-accounting principles, the answer is **no—our company has not yet provided the service, and so has not earned revenue**. Instead, because the customers have paid—honored their side of the **contract**—our company now has an **obligation** to provide the service in the future.[3] And we will have to expend resources in the future to satisfy the obligation. So it is a **liability** ($A \uparrow$, $L \uparrow$). In accounting, we call this liability **'Deferred Revenue.'** So this transaction looks like this:

[3] As a salient example of what Deferred Revenue is all about, consider the **Fyre Festival** debacle of 2017. Would-be festival attendees paid up front. But should the company be able to recognize those payments as profits before it actually put on the festival and provided the agreed service?

Transaction	Assets	Liabilities	S.E.
#8: Receive cash for training in advance	+$800 (Cash)	+$800 (Deferred Revenue)	

And our **new balance** (adding this transaction to the last balance) looks like this:

Transaction	Assets	Liabilities	Sh.'s Equity
#1-#8	$12.3k (Cash)	$5k (Notes payable)	$15k (Common Stock)
	$10k (Equipment)	$1k (Accounts Payable)	$7k (Revenue)
	$2.4k (Prepaid Rent)	$0.8k (Deferred Revenue)	
	$1k (Supplies)		
	$3.1k (Accounts Receivable)		

'Deferred Revenue' is also sometimes called **'Unearned Revenue.'** The two terms are interchangeable, and mean the same thing. Both terms help convey the idea. The first term, 'Deferred Revenue,' denotes that we will **'defer' recognizing** the revenue until we actually provide the service. The second term, 'Unearned Revenue' denotes that we have **not yet earned** the revenue. When we provide the service, we will earn it, and it will be *Revenue* then.

2.8.1 Takeaways

There are three **weird things** you need to wrap your mind around here:

- **Revenue Recognition principles:** The form of this transaction is the opposite of Transaction #7, but the principle is the same. In this case, the company **does not recognize revenue** even though it has **has received cash from customers**, because it has not **provided the service**. We record revenues when they are **earned.**

- **Deferred/Unearned Revenues are not Revenues, they are Liabilities:** Understand it. Memorize it. Don't let it trip you up. The terms have 'revenue' in them, but they are not *Revenue* accounts.

- **Advanced concept—*Deferred Revenue* as "customer-provided financing"**: In this transaction, we recorded **customers'** pre-payment as a liability (L). Does this contradict our initial model, in which L represents **financing from creditors**? Not quite. You can think of this as if **customers provided a loan** to the company, which the company is **obligated to settle at a later day**, by providing the service. If the company does not deliver on its promises to provide services to customers (a la Fyre Festival), it should pay them back—and if it can't do that, it will surely

have trouble finding new customers and staying in business. So, this obligation comes **prior to shareholders**, and still fits with the **"what's left over"** intuition for the accounting equation ($E = L - A$).

Business transactions and models like this are not uncommon. Pre-pandemic, you likely **bought tickets for concerts in advance.** Or, consider **Kickstarter.** On that platform, prospective **future customers** help **finance** the development of new products, in return for the right to get the product once it is produced. So, ***Deferred Revenues*** are, conceptually, a form of **credit financing from customers.** Innovative companies sometimes use this as one of their major sources of financing in their early stages.

2.9 Transaction 9: Paying Salaries to Employees, $1.8k

On payday, firms pay their employees in cash for the work they've done since the last paycheck, typically every two weeks. How do we account for this? **Start with cash.** That Asset account goes down by $1.8k ($A \downarrow$). What balances this? In previous transactions, when the company **spent money** on something, that *thing* was always an asset. But is there an asset here?

The FASB definition of an asset was: "Probable future economic benefits obtained or controlled by a particular entity as the result of past transactions or events." But **employees can walk away** any time they want, in a free country. They are not resources **"controlled by"** the firm. The company can't be certain that the money it spends on its employees today will continue to provide benefits next year.[4]

So, in this case, the **money spent on salaries represents an *Expense*** rather than an asset. How do we account for this? **Expenses effectively just function as anti-Revenues**. So, we put expenses **in the Shareholders' Equity column, with a minus sign**, to denote how expenses **decrement** Shareholders' Equity. (And also recall the **core identities** of accounting, and how expenses decrement Net Income, which flows into Retained Earnings, which is a part of Shareholders' Equity.)

Transaction	Assets	Liabilities	Sh.'s Equity
#9: Pay salaries, $1.8k	-$1.8k (Cash)		-$1.8k (Expense)

And our **new balance** (adding this transaction to the last balance) looks like this:

[4] It's a cliche for executives to say that "Our greatest asset is our employees." But accounting standards and many business-school profs disagree. Your employees can walk away at any time.

Transaction	Assets	Liabilities	Shareholder's Equity
#1-#9	$10.5k (Cash)	$5k (Notes payable)	$15k (Common Stock)
	$10k (Equipment)	$1k (Accounts Payable)	$7k (Revenue)
	$2.4k (Prepaid Rent)	$0.8k (Deferred Revenue)	-$1.8k (Expense)
	$1k (Supplies)		
	$3.1k (Acc. Receivable)		

2.9.1 Takeaways

There are two **weird things** you need to wrap your mind around here:

- **"Immediately expenseing" vs. "capitalizing as an Asset":** As we've seen, sometimes when a company spends money on something, that *thing* is an asset (and, as we've hinted, those assets will *become* expenses later). But sometimes, as in this case, that expenditure is an **expense right away**. What determines the difference? That question is what a lot of accounting is all about. Consistent with the FASB definition, if the *thing* will be used over **multiple periods**, and is **controlled** by the firm, it may be an asset. **If not, it's "immediately expensed."**

- **Expenses just function as 'anti-Revenues' and decrement S.E.:** We previously laid out the full logic behind why we put *Revenues* in the Shareholders' Equity column, using the core identities. Expenses are just the opposite of Revenues. So, symmetrically, we track them as negative entries in that column.

2.10 Transaction 10: Pay a $.1k Dividend

As we discussed in Chapter 1, companies *can* elect to **pay dividends** to their **investors (shareholders/stockholders)**. When they do so, it is as if they are just moving cash from the company's bank account, over a line, and into the owners' bank accounts. This is essentially how investors get paid back on their **Common Stock** investments.

How do we account for this? **Start with Cash**. The company disburses $100 in cash to its investors, so that Asset account goes down ($A \downarrow$). What balances this? Recall that dividends are **not expenses**, not a cost of doing business, or something that decrements the value *generated* for shareholders. But they do decrement the amount of that value that has been *retained* in the corporation—that is, the *Retained Earnings*. (**Core identity**: $\Delta Retained\ Earnings = Net\ Income - Dividends$.) So, we account for these as ***negative*** **entries in the Shareholders' Equity column**:

Transaction	Assets	Liabilities	Shareholders' Equity
#10: Pay a cash dividend $100	-$100 (Cash)		-$100 (Dividend)

And our **new balance** (adding this transaction to the last balance) looks like this:

Transaction	Assets	Liabilities	Shareholders' Equity
#1-#10	$10.4k (Cash)	$5k (N.P.)	$15k (Common Stock)
	$10k (Equipment)	$1k (Accounts Payable)	$7k (Revenue)
	$2.4k (Prepaid Rent)	$0.8k (Deferred Revenue)	-$1.8k (Expense)
	$1k (Supplies)		-$0.1k (Dividend)
	$3.1k (A/R)		

2.10.1 Takeaways

There are two **weird things** you need to wrap your mind around here:

- **Dividends are not expenses:** Dividends are discretionary cash disbursements to shareholders. They are not a cost of doing business, or a cost incurred by shareholders. Think of them as **cash moving over a dividing line**, from the company's bank account into its owners' bank account.

- **But dividends do decrement S.E.:** You can think through the **core identities** again to fully understand the logic, of how dividends reduce Shareholders' Equity by reducing Retained Earnings ($\Delta \textit{Retained Earnings} = \textit{Net Income} - \textit{Dividends}$). You can also think about it this way: When investors (shareholders/stockholders) **pay in cash**, we called that "Common Stock," which was a part of Shareholders' Equity. So, when the company turns around and **pays cash out** to them, that's just, in a sense, **reversing** that cash flow.

2.11 What's next?

So, even at this early stage of this course, we've actually done a pretty good job **accounting for** a breadth of "real"/external transactions—that is, *exchanges* with outside parties. So, what are we missing? What's wrong with the picture so far?

- First, if you look at our last table above, **it's getting ugly and unwieldy**. This is despite the fact that we only had five asset accounts and three liability accounts!

Most real corporations will have several dozens. So, in **Chapter 3**, we won't overturn any of these accounting *concepts*, but we will learn some **new tools for organizing** all of this information better. We'll learn to keep the Accounting Equation in Balance using **"debits"** and **"credits."**

- Second, as you've intuited, there are many *expenses* that we haven't accounted for yet. When the company first purchased Equipment, Supplies, and Prepaid Rent, those were all recorded as assets, initially. But, based on the accounting principle of **matching**, as the company **"uses those assets up"** we will recognize expenses. But there will be no particular moment of "real" exchange to trigger that—**no external transaction** during the reporting period. Instead, we recognize these expenses **at the end of the reporting period**, as **"adjusting entries"** (also called "**internal transactions**"). This is what we'll cover in **Chapter 4**.

- Third, we said at the beginning that accounting is ultimately about going *from* transactions *to* financial statements. We also have a couple of vague loose ends here. For example, in the above, I said that "Revenues and Expenses contribute to Shareholders' Equity, via Retained Earnings, but aren't reported as S.E. accounts." And we haven't yet aggregated the company's Revenues, Expenses, and Dividends into a **Retained Earnings** account. To get things just right—to avoid careless errors—we'll learn some fairly **rote** "**mechanics of the financial reporting process**." This will give us a reliable process for going *from* the transactions to the financial statements. This will be **Chapter 5**.

3

Debits and Credits and their uses: Journal Entries, T-accounts, and Trial Balances

In Chapter 2, we accounted for **10 external transactions**. We discussed the **logic** behind the accounting for each transaction and, each and every time, we verified that the core identity, **The Accounting Equation**, held. And at the end of this exercise, we ended up with a table that looked like this:

Transaction	Assets	Liabilities	Shareholders' Equity
#1: Sell Common Stock	+$15k (Cash)		+$15k (Common Stock)
#2: Borrow from the bank	+$5k (Cash)	+$5k (Note payable)	
#3: Purchase equipment for $10k	-$10k (Cash), +$10k (Equipment)		
#4: Pay rent up front, $2.4k	-$2.4k (Cash), +$2.4k (Prepaid Rent)		
#5: Purchase supplies on account, $1k	+$1k (Supplies)	+$1k (Accounts Payable)	
#6: Provide training for cash, $3.9k	+$3.9k (Cash)		+$3.9k (Revenue)
#7: Provide training on account, $3.1k	+$3.1k (Accounts Receivable)		+$3.1k (Revenue)
#8: Receive cash for training in advance $0.8k	+$0.8k (Cash)	+$0.8k (Deferred Revenue)	
#9: Pay salaries, $1.8k	-$1.8k (Cash)		-$1.8k (Expense)
#10: Pay dividend $0.1k	-$0.1k (Cash)		-$0.1k (Dividend)

Table 3.1: The 10 Transactions with the Accounting Equation, from Chapter 2

There's **nothing wrong** with this table, or missing from it. Every transaction the

firm made was correctly and **fully accounted** for. The problem is just that it's getting **messy and busy**, even though we have only tracked 10 transactions, affecting only 12 accounts. And real corporations would have **dozens of accounts**, and **many thousands of transactions** every reporting period. The remainder of this chapter is just about how to **organize and represent** this same accounting in more economical and useful ways, to be able to accomodate real-world accounting.

3.1 Organizing our accounting

Look at that big table again: In each **transaction**, we wrote out the **entire accounting equation** each and every time (with separate columns for **A, L, and E** throughout), even though we **only use two columns**. It seems a bit excessive. It seems more natural to just write out something like this:

"Transaction #1: ↑ $15k Cash (+A), ↑ $15k Common Stock (+S.E.)."

This is more straightforward and economical than what we've been doing (no extra empty column). And this is **pretty much** (with one change) what we're going to call the **Journal Entry** approach. We will use journal entries to track the **incremental effect** of each transaction on the **accounts involved**, in a simple way.

Firms might additionally want to know **what has happened to one particular account**—that is, **all of the transactions** involving, e.g., Cash, or Supplies as well as the **final balance** of those accounts. While we do *have* of all of that information preserved in Table 3.1 above, it would be a pain to extract the information for each account each time.

In short, it's natural for companies to want to track **all transactions affecting**, and the **final balances** of, **each account.** This is **pretty much** (with one change), what a **'T-account'** will be. Each individual account (like Cash, Supplies, Accounts Payable) will have its own tracking, with increases on one side of a **T**, and decreases on the other, and the *balance* of the account reported, like so:

Cash	
+$15k	-$10k
+$5k	-$2.4k
+$3.9k	-$1.8k
+$0.8k	-$0.1k
$10.4k	

Finally, a third thing that companies might naturally want is to know **where *all* their accounts stand** at a particular point in time—that is, the final **balance** of **all** of

its accounts: Cash, Equipment, Revenue, etc. That is, it might like to have a **list** of balances, like this:

Account:	**Balance:**
Cash:	$10.4k
Equipment:	$10k
Revenue:	$7k
...Etc.	...Etc.

This is **pretty much** (again, with one change) what we're going to call the **Trial Balance**: a list of the final balances of each account. The Trial Balance will be especially useful for the final step in the process of accounting—going **from transactions to the Financial Statements**. Remember that the Financial Statements are reported *as of* the end of the reporting period, and, reductively, tell you the **final balances** of the company's accounts as of that date. Those final balances are all lined up in a Trial Balance, by definition—so that's what we'll use to fill out the financial statements.

This might seem like a lot, right now, but bear in mind that there are **not any new accounting ideas** here. These are just three ways of organizing the information and accounting we already did. Summarizing:

- **Journal Entries** will track the **incremental effect** of each transaction on the accounts involved in the transaction—that is, the *change* in each account from it.
- **T-accounts** will track the **full sequence** of changes in **each** particular account, as well as the **balance**.
- **Trial Balances** consolidate and list the final balances of **all accounts**, in one list.

But, this raises a potential problem: The Accounting Equation is *the* core axiom of accounting. If it doesn't hold, we're not doing accounting correctly or coherently. So, if we stop using the format we used in Chapter 2 (with separate columns for A, L, and E for each transaction), how can we be sure to keep things in balance?

3.2 Debits and Credits: *The* Tools of Accounting

This is where **debits and credits** come in. These are simply the terms we use, for historical reasons, for a mnemonic tool for accounting. Here's how it works:

3.2.1 The rules

- For practical purposes, all **debit** means is **'on the left'** and all credit means is **'on the right.'** That's it. That's really it.
  - **Debit: Left**
  - **Credit: Right**
- For **asset** accounts, when the account **increases**, that's a **debit** to the account (tracked on the left side of the account); meanwhile, for **liability and shareholders' equity** accounts, when the account **increases** that's a **credit**.
  - And, symmetrically, for asset accounts, decreases are credits, while for liability and shareholders' equity accounts, decreases are debits.
  - Summarizing visually:
    - **A: ↑ Debit, ↓ Credit**
    - **L, E: ↑ Credit, ↓ Debit**
- Finally, for any given transaction, and thus, across all transactions, the **total debit amount ($) must equal the total credit amount ($)**.
  - **Debits ($) = Credits ($)**

What about **Revenues, Expenses, and Dividends**? Just like in Chapter 2, we will think of these as **contributors to** (or components of) **Shareholders' Equity**. Revenue increases Shareholders' Equity: Therefore, **revenues are credits**. **Expenses just function as anti-revenues, so they are debits**. **Dividends** also decrease Shareholders' Equity (by decreasing Retained Earnings), so they are also **debits**.

3.2.2 The why

If you think about this carefully, you can see that this list of rules is just an **algorithm for keeping the Accounting Equation in balance** in any transaction.

It's easiest to see this by starting with simple concrete examples. For example, from Chapter 2, we know that if one asset account increases ($A \uparrow$), one of three things must happen to balance it: (i.) another asset must decrease ($A \downarrow$), (ii.) a liability must increase ($L \uparrow$), or (iii.) shareholders' equity must increase ($E \uparrow$).

In this **new world of debits and credits** we just entered, an increase in an asset account is a **debit**. And all **three** of the alternatives that could balance it out are **all credits**. If you keep thinking hard, you can see how this applies more generally. E.g., a decrease in an asset (such as paying out cash) is a credit and so it must be balanced

out by a debit—an increase in another asset, or a decrease in a liability or shareholders' equity account. And so on.[1]

3.2.3 Jargon: 'debit accounts' and 'credit accounts'

It's very common in accounting to talk about the **"natural balance"** of particular accounts, or call accounts **"debit (vs. credit) accounts."** For example, **Cash** is an asset, so increases in Cash are **debits**. Obviously, corporations usually have *positive* (rather than negative) **balances** of cash. This means that the '**"natural balance"** of the **Cash** account will be a **debit**. So, for shorthand, we sometimes call Cash (and other asset accounts) a **"debit account."** Similarly, **Revenues** are **credits**; and, there's no way a firm can have negative revenues (since the flows that decrease profits are called expenses instead). So the "natural balance" of the revenue account is a credit, and we call it a **"credit account."** Put simply, if increases in an account are registered as a debit (vs. credit), we call that account a "debit account" (vs. "credit account").

At this point, you have all you need to understand the rest of this chapter: Everything else is just a matter of applying this new algorithm to track the transactions that we already solved previously, but using our new tools and formats. We'll use debits and credits—and the rule that total debits must always equal total credits—to track transactions across the three formats we discussed above: **Journal entries**, which track the **incremental effect** (changes in accounts) from each transaction; **T-accounts**, which track the full sequence of transactions across **each separate account**; and **Trial Balances**, which list the balances of **all** of the company's accounts.

3.3 Journaling the 10 Transactions

Now, it's time go back and do those same 10 transactions again, but this time using the algorithm we've learned for tracking transactions using debits and credits.

[1] Here's another way of understanding it verbally, though this is a bit of a mouthful. Restating rule #2 above, you could define a **'debit'** as: **'asset up, or liability or shareholders' equity down'**; and you could, in turn, define a **'credit'** as **'liability or shareholders' equity up, or asset down.'** As such, the rule that **'debits must balance credits,'** just means the following: 'If an asset account goes up, or a liability or shareholders equity account goes down, that must be counterbalanced by a liability or shareholders equity account going up, or an asset account going down.' And that's just a way of **restating the Accounting Equation**. But the term 'asset up or liability or shareholders' equity down' is a bit of a mouthful, isn't it? Hence the use of the term 'debit' as a useful mnemonic shorthand. Why do we use those particular words? There's no special logic to it—any other words would do just as well in this role. It just has to do with history.

Transaction 1: Sell Shares of Stock for $15,000

We learned last chapter that this increases Cash ($\uparrow A$) and Common Stock ($\uparrow S.E.$) by $15k. Now, we're just doing it with **debits and credits**. Since Cash is an asset account, that's a **debit** to cash. And the increase in Common Stock is the **balancing credit**.

Representing this in the journal entry format, we have…:

	Debit	**Credit**
Cash (+A)	$15k	
Common Stock (+S.E.)		$15k

And representing this in T-account format, we have:

Cash	
Debits	Credits
+$15k	

Common Stock	
Debits	Credits
	+$15k

And, at this very early stage, if we were to make a **Trial Balance** (a list of the final balances of accounts), it would look like this:

Account:	**Debit**	**Credit**
Cash (+A)	$15k	
Common Stock (+S.E.)		$15k

Transaction 2: Borrow cash of $5,000 from the bank

We know that Cash ($\uparrow A$) and Notes Payable ($\uparrow L$) increase by $5,000 as a result of this transaction. Since Cash is an **asset** account, that **increase is a debit**; since Notes Payable is a **liability**, that **increase is a credit**. So the journal entry for this transaction would be:

	Debit	**Credit**
Cash (+A)	$5k	
Notes payable (+L)		$5k

Remember again that the **journal entry** just measures the incremental effect of this transaction—the *changes* in the two accounts being affected. So, the fact that Transaction #1 had also incremented the company's cash account has no bearing on this

journal entry. The journal entry isn't affected by what happened to the accounts previously. Instead, the effect of the whole previous **sequence of transactions 'lives on'** in the **T-account**.

And the updated T-accounts would look like this:

Cash

Debits	Credits
+$15k	
+$5k	
$20k	

Common Stock

Debits	Credits
	+$15k

Notes Payable

Debits	Credits
	+$5k

And, the Trial Balance, at this very early stage, would look like this:

Account:	**Debit**	**Credit**
Cash:	$20k	
Common Stock:		$15k
Notes Payable:		$5k

Table 3.2: Trial Balance after Transactions 1-2

Note how, **across all three formats**, **total debits and credits balance**—meaning that the accounting equation is kept in balance as well.[2] Now, going forward in these

[2]Though, obviously, within T-accounts, debits and credits *do not* balance *within* the particular T-account. If they did, this would just mean that the T-account had a balane of zero! Instead, for T-accounts, debits and credits balance across all of the T-accounts as a whole.

notes, and most of the lectures, I will **usually only display the journal entry**. The reason for this is that the T-accounts and Trial Balance take up **so much space**; and the journal entry, by definition, captures the *impact* on the company's accounts from the transaction, i.e., the *accounting idea*. Nonetheless, T-accounts and Trial Balances are useful tools for understanding accounting and for keeping track of complex series of transactions, and they will feature prominently on homeworks and exams. So you absolutely need to understand them, and should always try to think through the mapping *from* the journal entries I show, to the T-accounts.

Transaction 3: Purchase Equipment for $10,000

We know that Cash decreases by $10k, but a different asset, Equipment, goes up by the same amount. Since both are assets, the decrease is a credit, and the increase is a debit.

	Debit	**Credit**
Equipment (+A)	$10k	
Cash (-A)		$10k

Transaction 4: Pay for one year of rent in advance: $2,400

Cash decreases by $2,400, but the asset called Prepaid Rent increases by the same amount. Since these are assets, the increase is a debit, and the decrease is a credit.

	Debit	**Credit**
Prepaid rent (+A)	$2.4k	
Cash (-A)		$2.4k

Transaction 5: Purchase Supplies for $1,000 on Account

Supplies goes up, and that's an asset, so that's a debit. Accounts payable goes up, and that's a liability, so that's a credit.

	Debit	**Credit**
Supplies (+A)	$1k	
Accounts Payable (+L)		$1k

Transaction 6: Provide Services for $3,900 in Cash:

Cash goes up and that's an asset, so that's a debit. And the company earns revenue here as well—since revenue increments shareholders' equity, that's a credit.

	Debit	Credit
Cash (+A)	$3.9k	
Revenue (+S.E.)		$3.9k

Transaction 7: Provide Services for $3,100 on Account

In a credit sale, both *Revenue* and *Accounts Receivable* increase. Since *Revenue* contributes positively to Shareholders' Equity, that increase a credit. Since *Accounts Receivable* is an asset, that increase is a debit.

	Debit	Credit
Accounts Receivable (+A)	$3.1k	
Revenue (+S.E.)		$3.1k

Transaction 8: Receive Cash of $800 in Advance from Customer

Cash increases, so that's a debit. *Deferred Revenue* also increases, and that's a liability, so that's a credit.

	Debit	Credit
Cash (+A)	$0.8k	
Deferred revenue (+L)		$0.8k

Transaction 9: Pay Salaries of $1,800 to Employees

Cash, decreases by $1,800, so that's a credit. *Salaries Expense* is an *expense*, an anti-revenue, so that is a debit.

	Debit	Credit
Salaries Expense (-S.E.)	$1.8k	
Cash (-A)		$1.8k

Transaction 10: Pay Cash Dividends of $100

Cash decreases, so that's a credit. And Dividends decrement Shareholders' Equity, so that is a debit.

	Debit	**Credit**
Dividends (-S.E.)	$0.1k	
Cash (-A)		$0.1k

3.4 Revisiting T-accounts

As warned, we didn't track the T-accounts for every single account for every single transaction, because they take up too much space. But it is important to be able to understand and visualize how transactions affect T-accounts. So, let's just create the T-account for **Cash**. Cash was received (debited) in Transactions 1, 2, 6, and 8, and spent (credited) in Transactions 3, 4, 9, and 10. So, after all 10 transactions, the Cash T-account would be:

Cash

Debits	Credits
$15k	$10k
$5k	$2.4k
$3.9k	$1.8k
$.8k	$.1k
$10.4k	

3.5 The Trial Balance at this point in time

Remember that a 'Trial Balance' is literally just a **list of the balances** of the company's accounts. It is that simple. If you find it confusing, you are probably overthinking it. The reason it is useful is that accounting is all about going from transactions to the financial statements. And the financial statements are a report of the company's accounts as of the end of the reporting period. So, a Trial Balance is a nice way to line things up, prior to filling out the financial statements. (And this is how we'll do it on the exam.) Please check my work, but I believe that, after our 10 external transactions, our Trial Balance would look like this:

Account:	**Debit**	**Credit**
Cash:	$10.4k	
Common Stock:		$15k
Notes Payable:		$5k
Equipment:	$10k	
Prepaid Rent:	$2.4k	
Supplies:	$1k	
Accounts Payable:		$1k
Accounts Receivable:	$3.1k	
Revenue:		$7k
Deferred Revenue:		$0.8k
Salaries Expense:	$1.8k	
Dividend:	$0.1k	
Retained Earnings:		$0
Total:	$28.8k	$28.8k

Table 3.3: Trial Balance after 10 external transactions:

There's one important detail here worth noting. Note how I added a row there for **Retained Earnings.** The balance of that account is **zero**. Why? Because this corporation **started its life in this reporting period**. So, it hasn't yet retained any earnings from previous periods.

Won't its Revenues, Expenses, and Dividends **flow in** to Retained Earnings? Yes, **they will**. But not yet. We still have balances of those Revenue, Expense, and Dividend accounts in this Trial Balance. We want those there, because we'll want to use this Trial Balance to fill out our Income Statement. So, if we kept those accounts there, but **also** add those quantities to Retained Earnings in the Trial Balance, we would be **double-counting** them, and throw the accounting equation (equivalently, our debits and credits) out of balance.

So, in a **Trial Balance**, the **Retained Earnings** is the Retained Earnings **from the end of the previous reporting period**. And we only update the Retained Earnings account right at the end of the reporting period, when we 'close out' the temporary revenue, expense, and dividend accounts. This is a detail—but one that will matter for getting things right.

4

End of Period: Adjusting Entries ("Internal Transactions")

Last chapter, we showed how companies account for "real" external transactions, at the exact moment of the exchange (e.g., the sale of a good to a customer, the purchase of supplies, or the transfer of cash). We covered a broad set of transactions, and accounted for them correctly. But we're still missing a few final steps on the path to reporting the company's **financial statements**, which is ultimately what accounting is all about. There are two parts to this.

1. The first is the "adjusting entries" or "internal transactions" (in contrast to real "external transactions") the company will make at the end of the reporting period, before closing the books. This is how we'll account for various expenses that you intuited should be coming. We'll cover these in **this chapter**. We'll finally see how the expenditure on assets like Equipment, Prepaid Rent, and Supplies is factored in as an expense, as those assets are "used up" over time.

2. Second, we'll need to cover some of the rote **"mechanics"** of the financial-reporting **process**—i.e, how we dot our i's and cross our t's, to make sure we report everything correctly. In particular, we'll see precisely how to use a final trial balance to fill out the Balance Sheet and Income Statement. We'll cover these "mechanics" of the reporting process in the **next chapter**, Chapter 5.

4.1 "Adjusting Entries" / Internal Transactions

In Chapters 2 & 3 we accounted for "external transactions"—"real" exchanges—during the reporting period. At the end of the reporting period, we account for what we call, by contrast, **"internal transactions,"** or **"adjusting entries."** What are these? The best definition is that these adjusting entries are **everything else**: Everything else the company needs to do before closing the books.[1]

4.2 Prepaid Rent → Rent Expense

Let's make this concrete. Suppose that our company does annual financial reporting, aligned with the calendar year, January 1 to January 1. *During the reporting period*, our company had paid for **two years of rent in advance**. We have already accounted for that external transaction, like so:

Prepaid rent (+A)	$2.4k	
Cash (-A)		$2.4k

Get 2-year lease, July 1, 2020

I added one detail here: Let's make things simple and assume that our company got this contract exactly **halfway through** the reporting period, **July 1**. Now, it's December 31, the end of the fiscal year—time to "close the books" and report the Financial Statements. Now, the company has **used up** 6 months of the rental contract, **one quarter** of the value. So, it needs to account for that **expense**, from expending this resource, and, additionally, account for the reduction in the value of the rental contract still remaining. But there will be **no moment of "real" exchange** that will trigger that. This means that the company must account for this as an "internal transaction" or "adjusting entry" at the end of the reporting period.

The reduction in the remaining value of the *Prepaid Rent (A)* is a credit. And the balancing debit is the *expense* from expending or using up that asset, which we call, unsurprisingly, *Rent expense*. So, the journal entry for this adjusting entry would be...:

[1] This somewhat-circular definition will become useful later on, when we see some gnarly, advanced cases where it's not clear whether something 'counts' as an external transaction. In those cases, all that really matters is that *if* a company does not account for something as an external transaction, during the reporting period, it must do so at the end, as an adjusting entry, before closing its books. At the end of the day, all that really matters is that a company report its financial statements correctly.

Rent Expense (-S.E.)	$600	
Prepaid Rent (-A)		$600

End of period adjusting entry for Rent Expense, 12/31/2020

Since the company initially had Prepaid rent of $2,400, but has used up one quarter of that resource, the **remaining balance** would be $1,800. You can see this using the T-account for Prepaid Rent. Remember that Prepaid Rent is an asset account, so it has a **debit balance**.

Prepaid Rent	
$2,400 (07/01/'20)	$600 (12/31/'20)
Balance: $1,800	

T-account after end-of-period adjustment, 12/31/2020

Think about what's happening here: The *initial purchase* of the rental contract (the external transaction) was recognized as an asset, because it was a *resource* that the company was going to use over *multiple periods*. And then we **apportion** that expenditure as expenses over time, via adjusting entries/internal transactions, and **reduce** the remaining **balance** of the asset account. After two years, once the lease is up, that balance will be fully reduced to zero ($\$2,400 - \$600 * 4$). This will be the basic pattern for assets in general.

4.3 Supplies → Supplies Expense

Recall that *during the reporting period*, our company purchased **Supplies** for $1k, on account. *Supplies* are a resource that our company expected to use over multiple reporting periods—an asset. So, we recorded that initial external transaction as...:

Supplies (+A)	$1k	
Accounts Payable (+L)		$1k

Initial Purchase of Supplies, 7/1/2020

Now, it's December 31, the end of the reporting period. 6 months have gone by. Presumably, our company has **used** (expended) its supplies to operate over this period.

But there has been no moment of "real" exchange—we have not yet recognized an *expense* from using that resource. So, we need to do so as a part of the "adjusting entries" at the end of the reporting period, before closing the books. Suppose we determine that 60% of our supplies are remaining, i.e, we have **used 40% of our supplies**. Then, intuitively, we need to reduce the remaining balance of the **Supplies** asset, and recognize that the amount we used/expended as an expense. The reduction in the *Supplies* asset is a credit, and the corresponding debit is, unsurprisingly, *Supplies Expense*:

Supplies Expense (-S.E.)	\$.4k	
Supplies (-A)		\$.4k

End-of-period adjusting entry for Supplies Expense, 12/31/2020

Note that **Supplies** is an **Asset** account, and **Supplies Expense** is an **Expense** account. Since the company has "used up" 40% of its \$1k in Supplies, it has a remaining **balance** of \$600 in its Supplies asset account. You can see this using the T-account.

Supplies	
\$1,000 (07/01/'20)	\$400 (12/31/'20)
Balance: \$600	

T-account after end-of-period adjustment, 12/31/2020

A question some students ask is: What about the *Accounts Payable* from the *initial purchase* of the Supplies? What do we do with it now? The answer is: Nothing. If and when our company pays off its account, that will be a "real" exchange (since we'll be paying out cash). So that will be a regular external transaction. Right now, we're just accounting for how we have "used up" our supplies. Nothing about what we're doing *now* involves our outstanding *Payable*.

4.3.1 Discussion: Income Statement vs. Balance Sheet Perspectives

Now that we've done two concrete adjusting entries, I want to introduce a concept and a bit of jargon that will show up more and more as the course advances. This is the notion of "income-statement vs. balance-sheet *perspectives*" in accounting.

The **"balance sheet perspective"** means that we focus our attention primarily on correctly measuring and updating the assets and liabilities of the firm, and reporting them correctly at the end of the period. That is, under this view, reporting the Balance

Sheet, and thus the net assets of the firm, is the priority. And income-statement accounts (such as revenues and expenses) are simply "plugs," or ways of explaining the changes in the **net assets** reported on the Balance Sheet, between periods.

The **"income statement perspective"** means that we focus our attention on the 'flow' of profitability from the company's operations, and think of the balance sheet accounts as 'plugs' used to, e.g., store and apportion expenses over time.

This might seem abstract or tedious right now. But these perspectives can enrich our interpretation of many different transactions and help us understand the linkages in accounting. More concretely, this distinction will help us correctly understand and account for certain more advanced transactions and methods later in the course. For now, consider the adjusting entry we just did.

Supplies Expense (-S.E.)	$.4k	
Supplies (-A)		$.4k

End-of-period adjusting entry for Supplies Expense, 12/31/2020

Here's two ways to think about this transaction, from the balance-sheet vs. income-statement perspectives:

- **Balance-sheet perspective:** "It's the end of the period, so we need to report our company's assets and liabilities correctly. We check our supplies closet, and only 60% are remaining. So, we need to reduce (credit) the *Supplies* account, and correctly report that amount ($.6k) on our Balance Sheet. Oh, and to keep things balanced, we also need to debit *Supplies Expense*. With that, the Income Statement will explain *how and why* the net asset balance changed."

- **Income-statement perspective:** "When we first bought the Supplies, in July, we bought a resource that we planned to use over many periods. So, intuitively, it didn't make sense to account for that full $1k as an *Expense* against our profitability right away. Instead, we 'stored up' that amount in an asset account, to apportion out as we used it. Then, over this period, we ended up expending 40% of that resource—so, to get a sensible measure of our profitability, we **apportion** that $.4k as an expense. Oh, and to keep things in balance, we also need to credit the *Supplies* account, for the $.4k that we've just apportioned out."

Many more "old school" accounting professors and texts fall into the balance sheet perspective camp. For them, at the end of the day, accounting is all about correctly measuring and reporting our assets and liabilities according to GAAP, and the income-statement accounts are just "plugs," explaining how those changes arose.

I personally (M. Shaffer) tend to lean more into income-statement perspectives. There's no right answer here, and I never wish to impose my perspectives on students. But I suspect that a lot of my explanations in my text, going forward, might have that flavor, in contrast to some other texts—so I wanted to note it, and *why*.

My view is that it doesn't make sense to prioritize the Balance Sheet in our thinking. As we said in Chapter 1, the "book value" of a corporation will never be the same as its "true" or market value. This is because there are many real economic assets (e.g., internally-developed R&D, customer loyalty, etc.) that are not recognized on the books under GAAP. And most assets that are recognized on the books are recorded "conservatively," asymmetrically. Wall Street analysts and investment bankers seeking to estimate the value of operating companies virtually never look at the book value of shareholders' equity as their metric—nor should they, given this.

Therefore, in my view, it doesn't make sense to focus our attention on measuring the Balance Sheet accounts *per se*, because *who cares*? The Balance Sheet, with its "stock" measures, doesn't tell us the real value of the company and never will—nor should it. Instead, the value of any company is a function of the expected future profits. So, in my opinion, the priority should be **measuring the flow of *profitability*** in a way that makes sense—that is persistent, captures the real, ongoing economics of the firm, and thus allows us to forecast *future profitability*. And the income statement can help us estimate that if it **matches expenses** in a rational, consistent, and predictable way over time. That's my opinion.

At this point in the course, these are just two ways of *looking at* this one same transaction. But, later on in the course, we'll often have the ***choice of two different allowable methods*** for accounting for some transaction or issue, with one characterized as an income-statement-focused approach and the other a balance-sheet-focused approach. So, this conceptual discussion will also become practical.

4.4 Equipment → Depreciation Expense

During the reporting period, our company purchased *Equipment* for $10k. Equipment is a resource that we expect to use for multiple periods, so it was an asset. Suppose for the sake of this example that we bought this Equipment right at the beginning of the last reporting period, January 1, 2020. We accounted for that transaction like so:

Equipment (+A)	$10k	
Cash (-A)		$10k

Purchase of Equipment, 1/1/2020

Now it's December 31, 2020, time to close the books and report. We have **used** this resource over the year, and need to **apportion** the expenditure we made. But *Equipment* isn't really like *Supplies*—we can't just go and count how much of our Equipment is left over. It's not that kind of thing. So, what do we do?

For Equipment, we **make an assumption**. Suppose we **assume** that we will use this Equipment for **10 years**, and then it will have reached the end of its **useful life** and we will dispose of it for $0 in cash. Then, under **straight-line depreciation**, we could **recognize** $1k in expense per year ($\frac{\$10k-\$0}{10\ years}$)—i.e., **apportion** the expenditure evenly over the *expected* useful life of the asset. And we **name** that expense *Depreciation*.

So, at the end of the reporting period, our adjusting entry would be...:[2]

Depreciation Expense (-S.E.)	$1k	
Equipment (-A)		$1k

End-of-period adjusting entry for Equipment, 12/31/2020

The remaining "book value" of the **Equipment** would then be $9k.

Equipment	
$10k	$1k
$9k	

T-account after end-of-period adjustment, 12/31/2020

And, after 6 periods, as of 12/31/'25, the remaining "book value" would be $4k.

Equipment	
$10k	$1k
	$1k
	$1k
	$1k
	$1k
	$1k
$4k	

T-account after end-of-period adjustment, 12/31/2025

In other words, the "book value" of the Equipment declines in a **straight line** over time. Hence the term "straight-line depreciation."

[2] N.B.: We will find out, next chapter, that many companies do this a little bit differently. But this is the basic concept.

4.4.1 Takeaways

There are two **weird things** you need to wrap your mind around here:

- In this case, the **Depreciation Expense** the company records—which impacts its net income—is a function of its **assumptions** about the future. This will be a theme. It turns out that "**the bottom line" is not so objective.**
- "Accounting depreciation" is not the same thing as "real" economic depreciation—i.e., the actual deterioration in the value or usefulness of an asset. It is the way of **apportioning** the **expenditure** on an asset over time.

4.4.2 Discussion: Depreciation is *weird*

Depreciation is one of the biggest expense items on many companies' income statements. So, understanding it is important. But it is **weird**. We'll discuss it in much greater detail in Chapter 9. For now, reflect on two **high-level takeaways**:

- **First** we use the term 'depreciation' in everyday speech, but the **accounting meaning** of the term is **different** from both the **everyday meaning** and the **economic meaning.** In accounting, depreciation is defined as the way that the expenditure on a physical ('tangible') long-term asset is allocated over reporting periods. (When the asset in question is a nonphysical, i.e., intangible asset, we use the term 'amortization' for the same concept.) And this can very well **differ** from the **'true'**/'economic' depreciation of the asset, i.e., the actual decline in the functionality and/or market value of the asset.

  For example, it's a cliché that 'the day you drive a new car off the lot, it loses 25% of its value,' in terms of its *market* value—what you could resell it for.[3] But if a business were buying that vehicle, expected to use it for 15 years before disposal, and were using straight-line depreciation, it wouldn't recognize a depreciation expense of 25% in the first subsequent report. In other words, the **reduction in the market value of the asset** will **not** be the same thing as the **accounting depreciation.**

  Or, consider this example: Suppose that a **baseball** team pays up front to hire a new **player**, for a 5-year **contract**. Suppose that that player is still **young** and actually **improves** over time, as expected. While the player himself is 'truly' appreciating, the cost of the initial up-front payment would still need to be apportioned as an expense (amortization) over time—in turn, the 'book value' of the contract would still be reduced over time. As always, in accounting, intuition

[3] (This has to do with "adverse selection" and other issues, which are the subject of another course. Google "the market for lemons" if you are curious to learn more.)

can sometimes be helpful, but sometimes confusing. Try always to remember the **technical definition of 'depreciation,' not the commonsense one**: Depreciation is simply how you **apportion the cost** of acquiring tangible assets, over the period of their use.

- **Second,** remember that the *Depreciation Expense* we recognized was a function of how long the **management *expected*** to use the asset. In our example, we assumed **straight-line depreciation** and **zero salvage value**, which is the simplest possible case. And yet, even so, the annual *Depreciation Expense* ultimately depended on **management's proclaimed expectations about the future**. And the future is never perfectly knowable. That **forecast** is not **objective**, **verifiable**, or **certain.**

  So, accounting *depreciation* is a function of *unverifiable, subjective* forecasts and estimates. And yet—*Depreciation Expense* is *an expense*, so it directly impacts the "bottom line." A company could be profitable or unprofitable in one quarter depending upon its **depreciation *assumptions***, holding its **real activities** fixed. In every day speech, people use the term "bottom line" to mean something that is objective, unquestionable, or undeniable. But it turns out that, in accounting, the "bottom line" is **anything but**.

  This will be another course theme. **Accrual accounting often depends upon unverifiable management *forecasts* and expectations — and those can sometimes be "gamed" or even abused.**

4.5 Generalizing: Asset → Related Expense

All of the cases we studied above had **one general form.** In each case, when we bought a resource that we expected to use over many periods, that was an **external transaction**, and we recorded the **Asset** at the **purchase price** ("you get what you pay for"). And then, at the end of the reporting period, we recognized an **Expense** based on how much of the asset we had "used up," as an **"internal transaction"** or **"adjusting entry." This basic pattern will hold for real assets in general.** You can think of the below as the "general form" for accounting for real[4] assets.

[4] 'Real' here is intended to indicate the caveat that, obviously, *Cash (A)* and other financial assets (e.g., investing in another company's stock) don't really behave this way, since we don't purchase cash, and we don't really 'use up' financial assets in the same way. Later on, we'll also learn about a few special 'real' assets that don't get "used up" over time.

Asset (+A)	$(Purchase Price)	
Cash (-A)		$(Purchase Price)

Purchase of Asset, date during reporting period

Related Expense (-S.E.)	$(Amount Used Up)	
Asset (-A)		$(Amount Used Up)

End-of-period adjusting entry for expense of asset, 12/31/2020

Note how this is intimately related to one of the two core principles of **accrual accounting**: the **matching principle**. We want to "match" our expenses to the revenues they helped to generate, and/or the periods in which they were used. But if we want to apportion rent as an expense **over time**, we can't recognize it all as an expense **right away**. So, instead, we first "capitalize" that expenditure as an asset, and then recognize that expenditure as an expense over time. The **definition of an asset,** and the **principle of expense "matching,"** are thus **two sides of the same coin, in accounting**.

4.5.1 Takeaway: Asset Balances, Expenses, and Purchases

Another thing we can now do and understand, with the knowledge we've developed, is infer how much of an asset a company *purchased* in a particular reporting period, using just information from the Income Statement and Balance Sheet. This is a common problem for homeworks and exams, because it's a simple quantitative application of a core concept. But it's also a common real-world application. Recall that as external users of financial statements, **we don't get to see each individual transaction in the company's journal entries. Instead, we only see their aggregated effects on the Financial Statements reported each period**. So, if we want to know how much a company spent on, e.g., *Supplies* in a period, this is the only way to do it.

When we purchase an asset, we write it up at the **purchase price** (i.e., amount we actually paid or agreed to pay); and, to date, the **only thing** that **reduces** the asset balance is the *expense* related to that asset. What this means is that **asset balances, purchases, and their related expenses**, are all linked—**"jointly determined"**—and so, if we know all but one, we can solve for the missing term.

For example, suppose that some company had reported a ***Supplies* balance** of $100k at the end of FY2020, and a Supplies balance of $120k at the end of FY2021, and recognized a **Supplies Expense** of $40k for FY 2021. And we are asked, how much did the company **purchase** in *Supplies* over the period?

It may help to visualize with the T-account. We have:

Supplies	
FY2020 end bal.: $100k	FY2021 expense: $40k
FY2021 purchases: $X	
FY2021 end bal.: $120k	

T-account illustrating solving for purchases

Supplies Expense is, by definition, the thing that reduces the balance of *Supplies (A)*. And we had $40k in *Supplies Expense* over the period. But **Supplies (A)** went up by $20k. So, it must be the case that the company **purchased** $60k of *Supplies*. That is something that we can *infer*, even thought it is not directly *reported* anywhere. Something new we can learn using accounting concepts. **If we know w, y, and z, we can solve for x**.

Or, as another example, if we were told only the beginning and ending balance of the asset account, and the purchases, we could infer the related expense. E.g., suppose the company ended the previous period with a balance of $100k of *Supplies*, then purchased $50k in additional supplies over this period, and then ended this period with $120k in *Supplies*. Then we can know, from this information alone, that it must have had *Supplies Expense* of $30k.

Generalizing this somewhat, we have the following formula:

$$Asset\ Ending\ Balance = Asset\ Beginning\ Balance + Purchases - Related\ Expense \quad (4.1)$$

And we could rearrange and rewrite this in any number of ways, including, e.g.:

$$Purchases = Asset\ Ending\ Balance - Asset\ Beginning\ Balance + Related\ Expense \quad (4.2)$$

$$Purchases = \Delta Asset\ Balance + Related\ Expense \quad (4.3)$$

... etc. But, if you understand the "general form of an asset," you don't need to treat these as new formulas to memorize, or a crutch. These follow directly from the concept from **how assets work in accounting**.

4.6 Salaries Expense: A period expense

The pattern above is how (almost) every real asset works in accounting. But it's **not how every expense works.** Recall from last chapter, Transaction #9, that when a company **pays its employees**, that is fully recorded as an **expense** right away—not an asset. We accounted for that external transaction—**payday**—like so:

Salaries expense (-S.E.)	$1.8k	
Cash (-A)		$1.8k

Payday, during reporting period.

Now consider what happens at the **end of the reporting period**. There is no asset to "expense out," like in the cases above. But, we still need to make an adjusting entry. Why? You may know that, **typically, employees get paid every two weeks.** So, suppose that, as of the end of the reporting period, our employees have **worked** one week since their last **payday**, and they earn $900 per week. This means they have **earned** $900 in additional income in this period, which is our **Salaries Expense**, and we need to **account for** that before closing our books. But we have not paid them yet. This means that, when we close our books, we will have a **Liability**—the obligation to pay them in the future. As in previous cases, we call this obligation to pay cash later a **'Payable.'**

Salaries expense (-S.E.)	$.9k	
Salaries Payable (+L)		$.9k

End-of-period Adjusting Entry for unpaid Salaries, 12/31

As this example shows, **not every end-of-period adjusting entry** is a matter of an asset being "expensed out" over time. Many are, but not all. In this case, we accounted for a liability that we *incurred*—or, to use accounting jargon, a ***liability that accrued*** over time—but which we have not yet paid. This is why I used the more general definition: "Internal transactions/adjusting entries, are everything you need to do before closing the books, but which *wasn't* accounted for as an external transaction."

5

Closing the Books: The Mechanics of Financial Reporting

5.1 The "mechanics" of the financial reporting process

We said that the "adjusting entries" / internal transactions are, by definition, "**everything else** we need to do before closing the books and reporting our financial statements." So, now that we have our adjusting entries, we are ready to do just that. Here is a simple summary of how we do it:

- (1.) We take the **final balances** of all of our accounts, after including the adjusting entries. By definition, a list of the balances of our accounts at a point in time is a "Trial Balance." And we use the term **"Adjusted Trial Balance"** to denote where the Trial Balance stands *after* incorporating all of the internal transactions / adjusting entries at the end of the period.

- (2.) We just *list* all the Revenue and Expense accounts on the Income Statement, and calculate Net Income.

  - Since Revenues, Expenses, and Dividends are 'temporary accounts' that are measured over a period, and "live on" in Retained Earnings, we calculate the updated Retained Earnings. We could also explicitly go through the motions of setting those temporary accounts back to zero, which is sometimes

called "The Closing Process."

- (3.) We just *list* all of the Asset, Liability, and Shareholders' Equity accounts on the Balance Sheet.

  – And, importantly, we use the *Retained Earnings Identity*, discussed several times, to calculate the new *Retained Earnings Balance*

5.1.1 Unadjusted Trial Balance

In order to report our Income Statement and Balance Sheet, we first need to get the **final balances** of all of our accounts, as of the end of the reporting period. We have a convenient tool for organizing all of those: **The Trial Balance**.

As of the end of Chapter 3, after completing the 10 "external transactions," our **unadjusted Trial Balance** looked like this...:

Account:	Debit	Credit
Cash:	$10.4k	
Common Stock:		$15k
Notes Payable:		$5k
Equipment:	$10k	
Prepaid Rent:	$2.4k	
Supplies:	$1k	
Accounts Payable:		$1k
Accounts Receivable:	$3.1k	
Revenue:		$7k
Deferred Revenue:		$0.8k
Salaries Expense:	$1.8k	
Dividend:	$0.1k	
Retained Earnings:		$0
Total:	$28.8k	$28.8k

Unadjusted Trial Balance, after 10 External Transactions

5.1.2 Adjusting Entries

And then, in Chapter 4, we did those four internal transactions/adjusting entries, at the end of the end of the reporting period. Recapping, those were...:

Rent expense (-S.E.)	$600	
Prepaid rent (-A)		$600

End of period adjusting entry for Rent Expense, 12/31/2020

Supplies Expense (-S.E.)	$.4k	
Supplies (-A)		$.4k

End-of-period adjusting entry for Supplies Expense, 12/31/2020

Depreciation Expense (-S.E.)	$1k	
Equipment (-A)		$1k

End-of-period adjusting entry for Depreciation Expense on Equipment, 12/31/2020

Salaries expense (-S.E.)	$.9k	
Salaries Payable (+L)		$.9k

End-of-period adjusting entry for unpaid salaries, 12/31/2020

5.1.3 Adjusted Trial Balance

So, to get our **final**, adjusted Trial Balance—which we'll use to fill out the financial statements—we just need to add in those adjusting entries. This is tedious, but rote:

Account:	Debit	Credit
Cash:	$10.4k	
Common Stock:		$15k
Notes Payable:		$5k
Equipment:	$9k	
Prepaid Rent:	$1.8k	
Supplies:	$.6k	
Accounts Payable:		$1k
Accounts Receivable:	$3.1k	
Revenue:		$7k
Deferred Revenue:		$0.8k
Salaries Expense:	$2.7k	
Salaries Payable:		$.9k
Dividend:	$0.1k	
Rent Expense:	$0.6k	
Supplies Expense:	$0.4k	
Depreciation Expense:	$1k	
Retained Earnings:		$0
Total:	$29.7k	$29.7k

Adjusted Trial Balance, after 4 Internal Transactions

All I did was take the previous unadjusted Trial Balance—the list of where the account balances stood prior to the adjusting entries—and added extra rows for our new accounts (Salaries Payable, Rent Expense, Supplies Expense, and Depreciation Expense), and incorporated the *change* in each account indicated by each **adjusting journal entry.** Also note how *Retained Earnings* is still the balance from the beginning of the period (which happens to be $0 in this case, because the firm just started its life in this period), because the Revenue, Expense, and Dividend accounts for the period haven't yet been zeroed out and 'flowed' in to that account.

5.1.4 CTRL-C, CTRL-V to the Income Statement

Now, we just **copy and paste** the **Revenue** and **Expense** accounts over to the **Income Statement**. This is easy. There's only one **Revenue** account (because **Deferred Revenue** is a liability, not a Revenue), and all of the **Expense** accounts are explicitly named as such. So, our Income Statement will look like this...:

Income Statement for the Fiscal Year Ending Dec. 31 2020

Revenue	\$7k
Salaries Expense	(\$2.7k)
Supplies Expense	(\$.4k)
Rent Expense	(\$.6k)
Depreciation Expense	(\$1k)
Net Income	**\$2.3k**

Also, while we're here, we might as well calculate what our updated Retained Earnings balance will be, since that's reported on the Balance Sheet, which is up next.

$\Delta Retained\ Earnings = Net\ Income - Dividends = \$2.3k - \$.1k = \$2.2k$

5.1.5 CTRL-C, CTRL-V to the Balance Sheet

And now, we once again just **copy and paste**, listing all of our asset, liability, and shareholders' equity accounts. And the **only thing I need to think about is updating the Retained Earnings** balance—in this case, *from* 0 up to \$2.2k.

Balance Sheet as of December 31, 2020

Assets	**Liabilities**
Cash: \$10.4k	Accounts payable: \$1k
Accounts receivable: \$3.1k	Salaries payable: \$.9k
Supplies: \$.6k	Deferred Revenue: \$.8k
Prepaid Rent: \$1.8k	Notes Payable: \$5k
Equipment: \$9k	**Total Liabilities: \$7.7k**
	Shareholder's Equity:
	Common stock: \$15k
	Retained earnings: \$2.2k
	Total Shareholders' Equity: \$17.2k
Total Assets: \$24.9k	**Total Liabilities and S.E.: \$24.9k**

5.1.6 Note: We could have used the "closing process"

In the above, we just copied and pasted all of the revenue and expense accounts to the Income Statement, and all of the asset and liability accounts to the Balance Sheet, and used the **core identity** to update *Retained Earnings*. And we know that revenues, expenses, and dividends are 'temporary accounts' that are re-set to zero for the start of the next period. A more formal way of representing this is the "Closing Process." We could formally 'close out' all of the temporary accounts with journal entries, by fully

debiting *Revenues* (to zero them out), and fully **crediting** *Expenses* and *Dividends* (to zero them out), and placing the **balance** in *Retained Earnings*, like so:

	Debit	**Credit**
Revenues:	\$7k	
Salaries Expense:		\$2.7k
Supplies Expense:		\$.4k
Depreciation Expense:		\$.6k
Rent Expense:		\$1k
Dividends:		\$.1k
Retained Earnings:		\$2.2k

'Closing process', update to Retained Earnings, 1/1/2021

This gets us to the exact same Retained Earnings entry as before (as it must, given that $\Delta Retained\ Earnings = Revenues - Expenses - Dividends$). And, in my view, this is a fairly baroque procedure for two simple ideas we should know conceptually: (1) that Revenues, Expenses, and Dividends are temporary accounts, measured *over a reporting period*, and, (2), the Retained Earnings identity. Legendary BUAD 280 instructor Merle Hopkins says that students can simply remember that Revenues, Expenses, and Dividends "swim like a fish" into Retained Earnings. But some students find the Closing Process useful as a crutch, when first learning, and for **visualizing** the connection between the world of Income Statement "flow" accounts and Balance Sheet "stock" accounts. In the above you can *see*, in a journal entry, how all of the **temporary** flow accounts **'live on'** in balance of *Retained Earnings*.

5.1.7 Reporting "mechanics" wrap

So, as promised, that really was simple: We copy and paste the final account balances to the Income Statement and Balance Sheet, and the **only** thing we need to **think** about is updating **Retained Earnings**. The meaty concepts and ideas in this class are about how to account for transactions—i.e., how to update our accounts using **journal entries**. All of this **'procedural'** stuff—the unadjusted vs. adjusted trial balance, etc.—is just a crutch for tracking our work and keeping things organized. So, if you are feeling intimidated or confused by this aspect of things, you are probably **overthinking** it.

Summarizing, in this text, the "reporting cycle" involved these steps:

External Transactions → Internal Transactions / Adjusting Entries → Final Account Balances (organized in an Adjusted Trial Balance) → Financial Statements

The official course textbook (Spiceland et al., 5e) includes some extra steps in this process: The "closing process" discussed above, and, then, a separate "Post-Closing Trial Balance" before the Financial Statements. The concepts are all identical, and if

you internalize the idea, you should have no trouble reconciling the two. But in my text and course, I seek to minimize the rote "procedural" steps and maximize our confidence in our ability to rely on concepts and ideas instead, so I won't show a separate post-closing trial balance.

5.1.8 Classification and Ordering

In the above, I wanted to get right into filling out the financial statements, so I skipped over explaining one detail about the *ordering* or **'classification'** of the financial statements. Reductively, the Balance Sheet is just a *list* of Asset, Liability, and Shareholders' Equity Accounts, and their final balances as of the end of the reporting period. The 'classification' of the Balance Sheet is just about the *order* in which we list things.

First, as we've seen, Balance Sheets always separately group each category (A, L, *and* E), and always list Assets first, followed by Liabilities, then followed by Shareholders' Equity accounts (A, then L, then E). Typically, the Balance Sheet is split into two columns, with Assets on the left side and Liabilities and Shareholders' Equity on the right.

Liquidity

Within the asset and liability sections, accounts are listed in order of **liquidity**. Liquidity is a term that is commonly used in accounting and finance. In this context, it means how quickly the asset or liability is expected to be converted to or discharged in cash—or, more generally, how soon it is expected to provide its benefit or be settled. Put different, liquidity is like the **time horizon** of the asset or liability.

"Current" vs. "Long-Term"

It is also common to bucket assets and liabilities into **two binary categories** based on **liquidity**: We use the term **Current** (whether asset or liability) to indicate a liquidity of less than one year, and **Long-term** to indicate a liquidity of greater than one year.[1]

So, 'current assets' are those that will or can be converted to cash or value within one year. 'Long-term assets' are assets with a longer horizon than that. 'Current liabilities' are those that will come due and need to be settled in cash in less than one year. And 'long-term liabilities' are those that will come due later.

Jargon: "Working Capital" While we're here, I want to introduce a bit of jargon that we will end up using *a lot* in later phases of the course. We use the term **"working capital accounts"** to refer to a company's **current asset** and **current liability** accounts.

[1] For firms with operating cycles of greater than one year, the cutoff for the distinction is the length of their operating cycle, rather than one year.

(And, similarly, we sometimes use the term **"net working capital"** to refer to the total *amount* of a company's **current assets minus current liabilities**.)

Ordering

Within the major groupings, accounts are listed in continuous order of liquidity—that is, how fast they can be converted into cash or otherwise used or discharged. So, in the Asset category, **Cash is always the first account.** Typically, **Accounts Receivable** will be next—those are accounts owed by customers, and will usually be paid within one year. And long-term assets such as **'Long-Term Investments,'** which are investments in another company's debt and stock, and **'Property Plant and Equipment'** will be further down the Asset side of the Balance Sheet.

Among *current liabilities*, **Accounts Payable** — amounts owed to suppliers for goods and services purchased on account — will typically be the **most liquid**. And long-term loans from banks, etc., will be listed at the bottom of the liabilities section.

Finally, in the Shareholders' Equity section, the notion of liquidity doesn't really seem to apply (at least as far as I can tell), but it's conventional to list Common Stock before Retained Earnings. (I.e., **'paid-in capital' before 'earned capital.'**)

5.2 The Truth About Depreciation

5.2.1 The White Lie

In Chapter 4, I introduced *Accounting Depreciation*, which is accounting's way of **apportioning** the expenditure on long-term tangible assets, such as *Equipment*, over time. We accounted for the initial procurement of the *Equipment* at the **purchase price**, as we do for all assets, like so:

Equipment (+A)	$10k	
Cash (-A)		$10k

Purchase of Equipment, 1/1/2020

Then, at the end of the reporting period, as an adjusting entry, we **debited Depreciation Expense**, and, I *said*, **credited Equipment**, just as with other assets:

Depreciation Expense (-S.E.)	$1k	
Equipment (-A)		$1k

End-of-period adj. entry for Depreciation Expense on Equip, 12/31/2020

5.2.2 The More Complicated Truth: Introducing "contra-accounts"

But, it turns out that **I lied (or at least, elided) a little bit.** I did this because I wanted to focus on the **big-picture, unifying logic,** of how all the operating assets were "expensed out" via adjusting entries over time—the "general form" of assets—without getting bogged down in procedural details. And that big-picture concept still holds true. But many companies add an intermediate step in the process.

They do in fact **debit *Depreciation Expense*** as an adjusting entry. But, **instead of directly crediting Equipment**, many companies instead **credit a *separate account* called "Accumulated Depreciation."** As the name indicates, this account tracks the **accumulation** of *Depreciation* on the asset over time.

In particular, this account is called a **contra-Asset** account. This is a **new thing we haven't seen before**. It's called a contra-Asset account, because it "runs against," or **contra** to, an Asset account that it **references**, and **tracks its reductions separately**. Assets are debit accounts; **so contra-Assets are credit accounts.**

Making this more concrete, the **dirty truth** is that many companies instead account for *Depreciation Expenses* like the below:

Depreciation Expense (-S.E.)	$1k	
Accumulated Depreciation (+contra-A)		$1k

End-of-period adj. entry for Depreciation Expense on Equip, 12/31/2020

This means that, technically, the **Equipment** T-account *per se* is unaffected by depreciation expenses, since those reductions are all accounted for separately, in its **contra-Account**. So, after the first reporting period, the T-accounts would be:

Equipment (A)	
$10k	
$10k	

Accumulated Depreciation (-A)	
	$1k
	$1k

Equipment and related Accumulated Depreciation contra-account, 12/31/'20

5.2.3 Reporting at Book Value (or not)

In accounting, we use the jargon **"book value"** to indicate the **net** *accounting value* of an account—that is, net of reductions tracked in its contra-accounts. So, in the example above, that would be $9,000 (i.e., $10,000- $1,000).

Companies have **discretion** over how they **report this** on their Balance Sheet.

- (1.) they can **directly report Equipment at "book value"**, or
- (2.) they can **separately report** Equipment and Accumulated Depreciation right underneath it, with parentheses to indicate that it is a reduction.

In the former case the asset side of the Balance Sheet would look like what we saw earlier, before confessing to the "white lie":

Asset Side of Balance Sheet as of December 31, 2020
Equipment at Book Value

Assets
Cash: $10.4k
Accounts receivable: $3.1k
Supplies: $.6k
Prepaid Rent: $1.8k
Equipment (at Book Value): $9k
Total Assets: $24.9k

In the latter case (2.) it would look like this...:

Asset Side of Balance Sheet as of December 31, 2020
Accumulated Depreciation reported separately

Assets
Cash: $10.4k
Accounts receivable: $3.1k
Supplies: $.6k
Prepaid Rent: $1.8k
Equipment: $10k
Accum. Depreciation: ($1k)
Total Assets: $24.9k

As we noted, we **subtract Accumulated Depreciation** in calculating **total Assets**. So, we end up with the same total asset balance ($24.9k) either way.

5.2.4 Discussion of Accumulated Depreciation contra-account

Because *Accumulated Depreciation* is a contra-Asset account, tracking reductions in the related asset, its balance will be **subtracted** (one way or another) in calculating **Total Assets**. As we saw above, either we net it out, before reporting *Equipment* at book value, or we report *Equipment* and *Accumulated Depreciation* separately, with the latter indicated as a negative amount. So, we end up with the same total assets, shareholders' equity, *Depreciation Expense*, and *Net Income* either way.

So, what is the point of adding this extra step? Clearly, in terms of the **big picture** this is the **same** as the **"white lie."** Whether we account for the reduction in value of an asset *directly*, by crediting the account, or create a separate T-account for those reductions and credit *that*. This seems like a purely **semantic distinction**, and many students find it frustrating as a result.

But this is how it's done in practice. And there are ways in which you can **rationalize** it. There is **some extra information** we get from this. For example, with separate reported accounts for **Equipment** and **Accumulated Depreciation**, investors can directly see how much the company **initially paid** for those assets. Some financial analysts and researchers use the **ratio** of **Accumulated Depreciation** to **Equipment** as a measure of how aged the company's long-term assets are, or how obsolete the company's Equipment could soon be. This is potentially useful. If *Equipment* were just reported at book value, we would only know the net book value each period, rather than having distinct measures of the initial purchase price and the total depreciation since then, and wouldn't be able to calculate that metric.

But, that is, admittedly, a rationalization. There are many practices in accounting that are no doubt partly a matter of **history**, **path dependency**, and **convention**, rather than **pure logic**. Contra-Accounts are in use in many places in accounting—they are a part of the language of business, and even reported on company's financial statements (as we just saw). So, if we want to work in business, we need to speak the language, even if we're not sure the grammar is consistent.

6

Introduction to Ratio Analysis

To date, the primary focus of this class has been understanding **how** a company's **transactions** are **recorded** in its accounts and, thus, produce its **Financial Statements**. But, in the vast majority of business careers, you will more likely **start with the Financial Statement numbers**, and then **use them** to **analyze, assess, judge, and understand** the company's operations, position, performance, and value. Understanding what goes in to a company's financial-statement numbers is a key prerequisite for this kind of analysis. So these are not separate endeavors. But this chapter, of everything we've done so far, will map most closely to what you would actually do in a career as a businessperson, analyst, consultant, or investor.

6.1 The basic idea

At its core, the basis for 'ratio analysis' or 'financial statement analysis'[1] is a very basic idea: **No one accounting number, by itself, will tell you whether a company is performing well or poorly**. Suppose that you are told that a company has earned **$1m in net income** this year. Is this **good or bad**? Obviously, **it depends.** If that company were a small, new startup, in its second year of operations, and only had $1m of capital invested in it, this would clearly be very good performance—the investors would already be earning 100% of their initial investment back in available profits already. If, however, the company were large and mature, with invested capital of $10bn, and had

[1] The terms are used essentially interchangeably.

previously had years where it had earned in excess of $2bn, then, clearly, $1m in net income would be disappointing in light of that.

In other words, in judging whether a number indicates good or bad performance, **it depends**. There are a couple of major categories of things that it *depends on*.

- First, it depends on **how much its investors/owners have contributed in financing**. Owners invest in companies largely because they hope to get a good **return on** their investment. So, if you invest $1m in a company, you would clearly hope to accrue higher total profits than you would expect for a company in which you invested $10k.
- Second, it depends on the total **size** of the company, and the total assets it has employed its operations. (Note that, by our core accounting identities, this is closely linked to the first item, since $A = L + E$. We'll say more about that later.)
  - So, some of the most basic **ratios** will simply involve **scaling** a performance measure (like NI), by measures of total investment or size.
- And, third, and most broadly, it depends on **what the question is**—or, put differently, what particular **kind of performance** we are interested in.
  - E.g., the **performance metrics** that **shareholders** are interested in are naturally **different** from the ones that **creditors** are interested in.
  - Or, even more specifically than that, we might be interested in analyzing, in greater detail, one specific **component of or contributor to** bottom-line performance. E.g., how your 'asset efficiency' or 'margin' **contributes** to your profitability. (We'll say more about this soon.)

These considerations will determine the **ratios themselves**, which we will discuss in greater detail, below. But even that will not be the end of a real ratio analysis / financial statement analysis project. Typically, we'll also want to compare those ratios to the company's **industry peers and competitors**, as relevant "benchmarks," and consider the company's relative performance and **growth** over time. (See Section 6.5.) But for now, we'll focus on understanding the ratios themselves.

Some students get intimidated in this section of the course, when they see so many new formulas. But all we're doing in ratio analysis is **throwing a division symbol between two financial-statement numbers that we have already discussed in depth, and interpreting the result**. So, these ratios really aren't new.

We'll talk about the most well-known, conventional ratios used in practice. But these ratios were **not** handed down from Mt. Olympus, by law, or even from **GAAP**. These ratios were **invented by analysts** who were trying to understand companies.

And if you truly understand the accounting we've studied so far, you could invent some ratios of your own to answer the questions you are interested in answering.

6.2 Profitability Ratios

6.2.1 Return on Equity:

A key, central performance measure is **Return on Equity (ROE)**.

$$Return\ on\ Equity = \frac{Net\ Income}{Shareholders'\ Equity} = \frac{NI}{E}$$

You might think that this is new material for this course. But is it really? All we are doing here is throwing a **division symbol in between** two of the **most central accounting numbers** in the course: **Net Income** and **Shareholders' Equity**.

Why is this simple measure so common and popular? Go back to our Chapter 1 foundations. **Net Income** is the proverbial 'bottom line' profit—the accounting system's way of estimating the amount of value (wealth) that has been realized for the company's **owners** over the reporting period. **Shareholders' Equity** is the total amount that shareholders have contributed to the company's financing, through both direct investment (Common Stock) and 'as-if' reinvestment (Retained Earnings). So we could interpret this ratio verbally as:

> Return on Equity: The profit generated for shareholders, scaled by the total financing they have contributed.

Now it should be clear why ROE is such a central performance measure. For reasons we discussed in Chapter 1, the fields of finance and economics have traditionally assumed that companies are run as if for the benefit of the shareholders. The shareholders are the **owners** of the firm, and have the ultimate levers of control. If the company *does not* perform well from their perspective, they can (indirectly) replace the board and/or executives. More generally, as owners, they use various **'governance mechanisms'** to protect their interests. ROE measures how well the company is doing with their money, from their perspective.[2]

[2]Students often wonder why we use the **book value** of shareholders' equity rather than the **market value** of the shares in this ratio. Note that the market value of stocks fluctuates with investors' assessments of the performance of the company and their sentiment about its future prospects. So, for example, if a company's net income kept unexpectedly improving year to year, the company's market value of equity would likely increase in response. Thus, if we put the market value of equity in the denominator of this ratio, this company would be 'punished' for its excellent performance under this measure. Since the market value of equity fluctuates *in response to* companies' performance, it would usually be inappropriate to use it as a scaling factor in measuring the performance of companies. More fundamentally, book Shareholders' Equity *is what it is*—the **financing the owners have *contributed***. The market value of equity is something different. If the price of the stock trading in the "secondary market" increases,

6.2.2 Important calculation detail: Use the *average* value of B/S scaling factors

For all of these ratios, when we **scale** an **income-statement (flow)** measure (like NI) by a **balance-sheet (stock)** number (such as shareholders' equity), we use the **average value** of the **B/S (stock) account** over the same period and the last.

The reason for this is that income-statement items measure performance *over a period*, but balance-sheet (stock) items measure accounts at a particular point in time—specifically, the end of the reporting period. With ROE, we are seeking to answer the question, "How well did the company do generating income over the last period, with the financing from shareholders that it tied up and employed over that period?" So, it would not make sense to use only *Shareholders' Equity* at the *end of the period*.

In theory, we would ideally want the average amount over the entire period (that is, the weighted average across every day). But, as external users of financial statements, we only observe Shareholders' Equity at the end of each reporting period. So we use the average of the value from the same reporting period and the previous.

So, to get the calculation technically correct, it would actually be:

$$Return\ on\ Equity_t = \frac{Net\ Income_t}{\frac{(Shareholders'\ Equity_t + Shareholders'\ Equity_{t-1})}{2}} \tag{6.1}$$

... where the 't' subscript would indicate the value from the Financial Statement for the same period, and 't-1' indicates the value from the FS from the previous period.

As you can see, this makes things a bit messier and more complicated-looking, **needlessly, given the simplicity of the idea**. In this class, we're focused on understanding and internalizing the concepts, in the most clean and straightforward way possible. So, in my notes, I will ***represent*** it simply as $ROE = \frac{NI}{E}$ and expect you to **remember the rule** for homeworks, exams, and projects. (This is consistent with practice in the outside world—most other texts and references will ***represent*** the ratios without additionally specifying the measurement periods each time.)

6.2.3 Return on Assets:

Return on Assets (ROA) is another extremely common ratio.

$$Return\ on\ Assets = \frac{Net\ Income}{Total\ Assets} = \frac{NI}{A}$$

Once again, this 'new' ratio is just a matter of **throwing a division symbol between**

that's usually a good thing from the firm's perspective. But, stock trades *between* traders are not the same as *issuances* of *Common Stock* from the company. In the latter, the company receives cash financing. In the former, it does not. So, if our question is 'How well has the company performed, with the money its shareholders have put in?,' then we want **book** equity, not the market value of equity.

two very familiar accounting numbers. As you can see, this is the same as the formula for ROE, except we replace Shareholders' Equity in the denominator with Total Assets.[3] Expressed verbally, this ratio is: "The total profitability of the company, scaled by the total assets the company uses to generate that profitability." In contrast to ROE, this ratio is **agnostic about the sources of financing** for those assets: It "doesn't care" whether those assets (A) were financed by equity (E) or credit (L). A little algebra can be helpful for understanding the difference between ROA and ROE. Note the following identity:

$$ROE = \frac{NI}{E} = (\frac{NI}{A}) \times (\frac{A}{E}) = ROA \times (\frac{A}{E}) \tag{6.2}$$

As we can see, the difference between ROE and ROA is equal to A/E, another extremely common, important ratio, called "**leverage.**" Given the fundamental identity of accounting, $A = L + E$, we can also write leverage as follows:

$$Leverage = \frac{A}{E} = \frac{L+E}{E} = \frac{L}{E} + 1$$

This formula shows that leverage is essentially just a measure of how much the company has financed itself with **credit/liabilities relative to equity**. That notion is sometimes referred to as the company's "capital structure." The common term **"leverage"** denotes what we can see in Equation 6.2.3, above. Holding 'operational performance' (ROA) fixed, with higher credit financing, the shareholders of the company can "lever up" their return on their own investments.

Stated differently, the core difference is that *ROE* is a measure of performance that is **sensitive to leverage** (i.e., capital structure), while **ROA is less so**.[4] This can be an advantage or disadvantage, **depending on the question**. For example, if we simply wanted to compare how two different companies were performing operationally—how well the company was operating its asset base to generate revenues exceeding its costs—you might prefer to use return on assets (ROA). However, if you were yourself a shareholder in the company, interested in how well the management has performed with your money, on your behalf, ROE would be more relevant.

[3] (As before, for calculating in practice use the average total assets, from the same period and last.)

[4] Strictly speaking, if we wanted a measure of operating performance insensitive to capital structure, we would want to also take the debt-financing costs (interest expense) out of the profitability numerator—i.e., use a measure like EBIT. I defer some of these details for this undergraduate text.

6.3 The Drivers of ROE: The DuPont Decomposition

The DuPont Decomposition is a famous and useful way of breaking ROE down into three underlying components to examine different **drivers** of the company's performance: **profit margin** (sometimes called "return on sales"), **asset turnover** (sometimes called "asset efficiency" or "asset utilization"), and **leverage** (discussed above). This decomposition is just an **algebraic identity**. We just take the definition of ROE (NI/E) and multiply it by various terms that cancel each other out, to get three separate **components**.

$$ROE = \frac{NI}{E} = (\frac{NI}{S}) \times (\frac{S}{A}) \times (\frac{A}{E})$$

Note how the 'S' (for sales) cancels out in the denominator and numerator of the first and second terms, respectively, and the 'A' (for Assets) cancels out in the second and third. That is, we have **decomposed** ROE into three separate ratios:

- $\frac{NI}{S}$: Profit Margin
- $\frac{S}{A}$: Asset Turnover
- $\frac{A}{E}$: Leverage

6.3.1 Profit margin

NI/S is referred to as **"profit margin."** Here,'S' stands for Sales, which is just the word that is used in the context of this ratio for total Revenues. 'Margin' is a term that is used in everyday speech, so you may already be familiar with this. In words, this ratio is the company's **bottom-line** profits relative to its **top-line total sales (i.e., revenues)**. Thus it is a measure of how much of the company's gross sales it manages to keep as 'take-home' profitability, after all expenses are accounted for. The higher a firm's profit margin, the more *net income* it gets per each dollar of sales.

It is often described as a measure of "how well the company is **managing the income statement**"—i.e., how well it is doing managing **all of the expenses that come between the top line and the bottom line** of the income statement. Profit margins famously vary across industries. For example, in highly **competitive "commodity" businesses** such as grocers, profit margins may be extremely **low**, perhaps 5% or less. In **luxury-goods** businesses and **subscription software**, profit margins are typically much higher.

6.3.2 Asset Turnover

S/A is referred to as **"asset turnover"** (sometimes also called 'asset efficiency' or just 'efficiency'). It is equal to total sales divided by total assets. Thus it is a measure of how effectively the company is **employing its resources (its assets) to produce marketable goods**—hence why it is sometimes also referred to as 'asset efficiency.'

It is often described as a measure of how well the company is **managing the balance sheet**—i.e. how effectively it is employing the total assets it holds. Asset **turnover also varies widely across industries**. **Grocery stores and discount retailers** have thin margins (as referenced above), but **high turnover**. In contrast, a **luxury** jewelry retailer or Tesla dealer likely has high margins but **relatively lower turnover**. This is not a coincidence. In general, industries with **high margins** tend to have **low turnovers**, and industries with **low margins** tend to have **high turnovers**.

To understand this fact note the following identities:

$$Margin \times Turnover = \frac{NI}{S} \times \frac{S}{A} = \frac{NI}{A} = ROA = \frac{NI}{(E+L)}$$

This shows that profit margin times asset turnover equals *ROA*. And, given the core accounting identity, $A = L + E$, a company's total asset base is also equal to its total capital—the total financing it has received from both owners and creditors.

In "economic equilibrium," the return on capital should *converge* across industries. If capital investment earned a higher return in Industry X than Industry Y, they would not be in equilibrium, and capital would flow from Industry Y to Industry X. So, if the total return on capital, ROA, converges across industries, there must be a *negative relationship* between different industries' profit margin and asset turnover, since $\frac{NI}{S} \times \frac{S}{A} = \frac{NI}{A} = ROA$. Therefore, this **accounting decomposition**—paired with a notion of equilibrium from your macroeconomics classes—can explain the **empirical pattern** we observe in reality, that low-margin businesses tend to have high turnover (e.g., grocers), and high-margin business tend to have low turnover (e.g., luxury goods).

6.3.3 Leverage

A/E is referred to as "leverage." In general, leverage is **good on average for equity owners**, since it means that their profits are less diluted. But it also increases the riskiness of the company (since leverage multiplies both profits and losses) and **increases the risk that the company will go bankrupt**.

Here is the easiest way to understand this: By definition, from Chapter 1, companies **have to pay their debts** otherwise, they end up **in default**, and creditors can seize collateral, etc. All else equal, the more debt a company has, the higher its interest and principal payments, the higher the risk that it won't be able to make those payments

in the future. In contrast, **dividends are discretionary**. If a company financed itself 100% with equity, it would have zero risk of going bankrupt.

So, in short, leverage means **higher return on their investment** for shareholders, but **more risk**, especially risk of default and bankruptcy. Thus, on average, equity investors tend to like and to push for higher leverage levels, while debtholders tend to push for lower leverage levels.[5] Leverage ratios also tend to vary across **industries** and the **life cycles** of firms. **Early-stage** firms with uncertain prospects tend to be financed by **more equity** (that is, have lower leverage ratios), since their future cash flows are less certain and thus they would have a greater probability of bankruptcy if they were to rely heavily on debt financing. More **'mature' firms with more stable cash flows** are more likely to choose **higher leverage ratios** (that is, more debt relative to equity), because they have more certainty about their future cash flows and ability to service the debt. Historically, firms in the **financial industry** have had **very high leverage ratios**, and this became a topic of **controversy and new regulation** after the **financial crisis**, as leverage was seen to increase the **systemic riskiness** of the banks.

Finally, we can use The Accounting Equation to rewrite Leverage as:

$$Leverage = \frac{A}{E} = \frac{L+E}{E} = \frac{L}{E} + 1 = Debt\ to\ Equity + 1$$

The ratio $\frac{L}{E}$ is often given its own name, and called the "**Debt-to-Equity** Ratio." But note again that it encodes the exact same information and variation as **leverage**—just shifted by 1. So, everything that is true about leverage also applies to debt-to-equity. The official course textbook (Spiceland et al. *Financial Accounting*, 5ed) includes some discussion of debt-to-equity ratio at certain points. But I will not, because it is substantively the same thing as leverage, but leverage is the more conventional, commonly-used term in the outside world.

6.4 Credit Risk Ratios

In the above, we were mostly focused on understanding *performance* from a *shareholder's* perspective. But, the ratios and measures that are relevant also depend upon the question we are interested in. Financial *creditors* (that is, mostly debtholders) have a different set of concerns and focuses than shareholders. In particular, debtholders, by definition, stand to gain only their contracted interest and principal payments—

[5] You may have read in the financial press about "activist investors"—equity owners who buy up significant stakes in order to influence management to change policies in ways that they believe will increase the value of their shares. One of the major areas of focus for activist investors is leverage. Activist investors own the company's stock, and as such, they usually prefer higher leverage levels. They often encourage companies to issue more debt and pay out more cash to shareholders. Academic research has mostly suggested that activist investors are on average good for **shareholders**. But they remain controversial, partially because higher leverage levels increase riskiness.

they do not get any additional 'upside' beyond that. So, bluntly, they just want to know whether or not companies will make those payments.

There are a number of ratios that credit analysts have developed to measure companies' ability to pay their obligations. First a bit of **jargon**: We use the term **'solvency'** to indicate having assets that are worth more than liabilities—that is, positive **net worth**, over the **long run**. And we use the term **'liquidity,'** in this context, to mean the company's ability to **make specific cash payments coming due in the short term**. In business, **"cash is king"**—debtholders must be paid in cash, and so even companies that are highly profitable on *accrual measures* need to worry about converting their economic value into cold, hard cash. Since creditors don't get any additional 'upside' beyond their contracted payments, they care only about **solvency and liquidity**.

One of the measures we have already discussed, **leverage**, is somewhat relevant to assessing solvency. All else equal, the higher a company's *leverage*, the higher its **default and bankruptcy risk**. So, lenders pay attention that ratio, and frequently include it in their **debt covenants (jargon)**. These are **terms in debt contracts** that stipulate certain penalties on firms that violate them. So, e.g., if a firm's **debt contract** included a **covenant** around its **leverage ratio**, it might have to repay the principal early (before the original maturity date), if its leverage ratio grew to exceed the specified threshold.

For now, I'll cover just one ***liquidity measure***, the **current ratio**.

6.4.1 The current ratio

A simple measure of a company's ability to pay what it owes is the **current ratio**.

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

Recall that **'current'** indicates assets and liabilities that have a **time horizon** (ability to be converted into cash or discharged) of **less than one year.** Thus, if a company had a **current ratio of 1**, that would indicate that its **current assets equaled its current liabilities**, meaning that it would only **just barely** be able to pay off the liabilities due in the next year, using its current assets. This would be a fairly risky situation. The higher a company's **current ratio**, all else equal, the higher its short-term solvency and liquidity. A ratio less than 1 is troubling, indicating that the value of the company;s current assets is not great enough to pay for the liabilities due in the next year. Such a company will either need to raise new financing, or be at risk of default.

6.5 Using Ratio Analysis: Benchmarking, and Comparative Analysis

In practice, even after we have calculated these scaled ratios, we're not done. In almost every analysis, we would start by calculating these ratios, but then do a bit more to **"benchmark"** them. Remember how we began this chapter discussing the factors that *it* (i.e., assessing a company's net income) **"depends on"**? Let's add a couple more:

- It depends on how well that company's **peers and competitors** are performing. This matters for two reasons: First, because the company will have to successfully **compete** with them in order to **survive**. And, second, because they provide another **benchmark** for the company, for how well, as a firm in the same line of business, it *could be doing* (i.e., its **'counterfactual'**).
  - So, a typical ratio analysis project would involve comparing peer firms.
- It depends on that company's **own history**, that is, how well it has, itself, done in previous years. This matters for two reasons: First, the company's own **past performance** provides another relevant **benchmark** for assessing its current performance. And, second, because investors and managers want to see **growth** over time.
  - So, a typical ratio analysis project would, even further, look at how those ratios and differences have *changed over time, and relative to those peer firms.* Is our firm growing, and, in particular, growing faster than our competitors? Are our margins staying flat while theirs are improving? Etc.

There is no hard science of ratio analysis. It is simply a matter of understanding what the ratios means, and using your independent knowledge and judgment. The ratios are **tools for *us*** to use—not vice versa!

For example, suppose that you were comparing your own company, with an ROE of 20%, to a competitor with an ROE of 30%. If you were to discover that the two companies had the same asset turnover, but your company's profit margin were lower, this would suggest (a.) where the blame lay for your company's overall poorer performance, and (b.) a possible prescription. It might mean that your company should focus on *cutting out expenses* such as overhead (SG&A) to achieve a similar margin as your competitor. After all, your company's competitor has shown that it is feasible to achieve that margin in your industry. In contrast, if you were to find that the two companies were matched on profit margin, but your company had a lower asset turnover, this might suggest you should work to improve your efficiency, such as by improving operations management, or upgrading your factories, etc.

This decomposition can also help you understand trends in a company's overall profitability **over time**. For example, if a company's profit **margin were increasing** over several years, this might suggest that the company's **competitive position** was improving, i.e., that the company was increasingly able to **command premium prices** on its brand. Or, if a company's asset turnover was decreasing over time, this might indicate that it was losing discipline and efficiency, that its **scope** was increasing too much (it had more assets than it could employ efficiently), or that its operations had become less well **organized**. This would inform an executive's decision about steps to take in response. For example, if **asset turnover** was the culprit in poor performance, the company might require consultation from "ops" (operations) experts.

6.6 Leverage and risk

In the text above, I offered a verbal explanation of the "easiest way to understand" why "leverage means risk": Our company *has to* pay its debts, even when times are bad—or end up in bankruptcy—while dividends paid to owners are discretionary. Therefore, the more we finance ourselves through debt rather than equity, the greater the risk this imposes upon us, all else equal. So, why do companies issue any debt? Because, in good times, it helps owners "lever up" their overall rate of return (ROE).

In the below, I provide an example that illustrates in a more general and systematic way how **leverage** (A/E) can help a company **increase its Return on Equity** (ROE) on **average**, but comes at the cost of extra risk. (In particular, extra systemic risk, which will be closely related to *beta*, which will be a key concept in your future finance classes.) Here's the basic idea: We imagine a simple company and we hold its **operating performance fixed** (that is, its revenues and all of its expenses before its interest expense) and then **toggle its capital structure** (that is, its leverage, or how much it finances itself via liabilities vs. shareholders' equity), **between Columns 1 and 2**.

Then, we track how the differences between these capital structures play out, in terms of ROE, in two different states of the world: A **good** state of the world (**Scenario A**), in which the company earns **$100 in revenue**, vs. a **bad** state of the world (**Scenario B**, e.g., a macroeconomic recession), in which the company earns only **$90 in revenue**.

In order to illustrate the effect of **leverage** *per se* on ROE and risk, we **hold everything else fixed**. Suppose that all other expenses—that is, all operating / non-financial costs — are held fixed, at $75. Suppose that in both cases, the company's **interest rate on its debt is 20%.** (Note that this is a conservative assumption for our purposes—we would expect a company's interest rate to increase with its leverage, all else equal.) And suppose that the **tax expense** on its Earnings Before Taxes (EBT) is the current US corporate tax rate of 21%. (But note that companies pay zero taxes when they take a loss.) Now watch how things play out:

	(1.) Balanced ($50 Debt / $50 Equity)	**(2.) Levered ($90 Debt / $10 Equity)**	**Explanation**
Revenue	$100	$100	By assumption
-(All other expenses)	-$75	-$75	By assumption
EBIT	$25	$25	By construction
-Interest expense	-$10	-$18	20% x Debt
EBT	$15	$7	EBIT - Interest
-Taxes	-$3.15	-$1.47	21% x EBT
NI	$11.75	$5.53	EBT - Taxes
ROE	23.7%	55.3%	ROE = (NI / Equity)

Scenario (A): The good state of the world:

	($50 Debt / $50 Equity)	**($90 Debt / $10 Equity)**	
Revenue	$90	$90	By assumption
-(All other expenses)	-$75	-$75	By assumption
EBIT	$15	$15	By construction
-Interest expense	-$10	-$18	20% x Debt
EBT	$5	-$3	EBIT - Interest
-Taxes	-$1.05	-$0	21%. No tax if loss
NI	$3.95	-$3	EBT - Taxes
ROE	7.9%	-30%	ROE = (NI / Equity)

Scenario (B): The bad state of the world:

Note how in **Scenario A**, the highly-levered capital structure yields a far higher ROE—more than double that of the balanced capital structure—something that would be very pleasing to the company's shareholders. But notice how starkly things reverse in **Scenario B**. In that case, where the company's revenues decline by only 10%, the highly levered capital structure sends the company toward bankruptcy. It does not even earn enough to cover the interest expense on its debt, and its ROE is -30%. Meanwhile, the company with a balanced capital structure earns a healthy 7.9% ROE.

In general, **debt is good when times are good**: it allows equity investors (including homeowners, who have equity in their homes) to "lever up" their rate of return. But when **times are bad, debt makes them even worse**: Debt payments are fixed and non-discretionary, so companies have to pay them off even when it hurts them the most. In contrast, dividend payments to shareholders are discretionary, so when companies

are in financial straits, they can simply cut their dividends. As such, equity financing does not impose the same risk on a company.

6.6.1 Leverage, financial crises, and regulation

This example captures a general insight that has profound and far-reaching implications for the economy: Excess **leverage** was at the center of the **financial crisis.** Homeowners took on large mortgage debts and were unable to make payments and went into bankruptcy when the economy turned sour, In turn, various **financial institutions** were on the receiving end of those mortgage payments, and, further, were **extremely highly levered**. Thus, when homeowners began to **default** on mortgage payments, many highly-levered financial institutions themselves went into default and bankruptcy, or came very close.

To make the problem even worse, in the modern, financialized economy, financial institutions', corporations', and individuals' debt obligations are all 'interlinked.' One firm's **payable** is another one's **receivable**. So, a default by the **former** in turn increases the risk of default of the **latter**, and this can **propagate** in a vicious cycle. As such, **leverage increases systematic risk** as well—not just the risk of the individual company. So, this ratio of the most boring, basic accounting numbers, $\frac{A}{E}$, is at the center of financial crises.

To learn more, see Professor Anat Admati's "The Banker's New Clothes." Her work highlights how accounting ratios—and leverage in particular—are central to prudent financial regulation. She also documents how highly-remunerated, prestigious financial professionals and regulators misunderstood leverage-ratio regulations, because they **misunderstood the meaning of The Accounting Equation, which we covered in Chapter 1**. Many financial professionals and regulators resisted calls to require financial institutions to maintain lower leverage ratios (A/E) by arguing that **"holding more equity,"** would be problematic, because it would restrain them from lending out their cash, which is a profitable and socially-beneficial activity for banks to engage in.

What's the problem with this argument? It's a **blatant misunderstanding of The Accounting Equation**, and the nature of double-entry bookkeeping. As we learned in Chapter 1, the left side (A) tells you what the company has—e.g., in the case of a bank, whether it's holding *Cash* or has instead lent it out *Loans Receivable*—while the right-hand side ($L+E$) tells you how that amount was *financed*—how much was contributed by equity investors vs. creditors.

Whether banks would get more, safer financing *from* equity investors (including by, e.g., retaining more earnings, by paying out less to shareholders via dividends and repurchases), as opposed to getting more, riskier financing from creditors—that would all be taking place on the **right side of the Accounting Equation (L and E)**. It wouldn't

stop banks from putting their **Cash** to work in worthy investments, which would all be on the left side of the accounting equation.

7

Looping Back: Accrual Accounting Deep Dive

By now, we've seen the complete process by which we go from transactions to periodic financial statements. We've learned the core tools of accounting: debits, credits, journal entries, T-accounts, trial balances. We accounted for a number of simple transactions and used them to illustrate some core principles of accounting. This chapter is about going deeper—we'll cover *harder* transactions, with more complex journal entries, and do a deeper dive on *accrual accounting principles*. Instead of just correctly journalizing transactions, we'll focus on *interpreting them*—the understanding we build from that will help us create new tools for financial analysis. In particular, we'll see how, by understanding accrual accounting principles, we can calculate and infer a company's actual **cash flows** from its Income Statement and Balance Sheet accounts.

7.1 Timing Differences: (Revenues and Expenses) x (Deferrals and Accruals)

Recall from Chapter 1 that **accrual accounting** differs from cash-basis accounting in two primary ways: **Revenue Recognition** and **Expense Matching**.

- **Revenue Recognition**: Revenues are *recorded* when they have been **earned**—when we have **provided** the good or service—rather than when the cash is paid.

- **Expense Matching:** Expenses are, when practicable, *matched* to the corresponding revenues that they helped to generate—that is, recorded as expenses **in the same reporting period**—rather than when the cash is paid.

Therefore, one way to organize all accrual transactions is to categorize them by whether the **revenue or expense** is recorded **before, at the same time, or after** the actual **cash** changes hands. We can put everything in a simple matrix, this way.

- We use the term **"deferral"** to indicate cases in which the revenue or expense is recorded *after* the cash changes hands (**jargon**). (I.e., we 'defer' recognizing the expense into the future, just like an admitted college student could defer matriculation for a year.)

- And we use the term **"accrual"** to indicate a case in which the revenue or expense is recorded *before* the cash changes hands. (E.g., we 'accrue' *Interest Expense* or *Salaries Expense* over time, before the date on which we actually pay.)

With that terminology, we can organize all transactions in this simple matrix.

	...before cash paid	**....same time**	**...after cash paid**
Revenue earned...	Accrued Revenue	Cash Sale	Deferred Revenue
Expense incurred...	Accrued Expense	Immediate Expense	Deferred Expense

So, we can place all of our revenue-related transactions in this scheme, like so:

- When we sold services to a customer on account (Transaction #7), that was ***accrued revenue***—earned before it was paid.

- When we sold services to a customer in cash (Transaction #6), that was a vanilla **cash sale, with no timing difference** between the cash flow and revenue.

- And when the customer paid up front (Transaction #8), that was ***deferred revenue***, paid before it was earned—we had to 'defer' recording revenue into the future, once we provided the service.

And, we can place all of our expense-related transactions in this scheme, like so:

- When we made an adjusting entry for *Salaries* at the end of the period, for the *Salaries Expense* that had been incurred but not paid since the last payday, that was an ***accrued expense***—incurred before it was paid.

- When we paid our headquarters' electricity bill, that full amount was "immediately expensed" (rather than capitalized), with no timing difference between the cash flow and expense.

- And, importantly, in this scheme, all of our **(non-cash) assets *are* deferred expenses**—e.g., when we purchased *Prepaid Rent*, we initially capitalized that as an asset and *deferred* recording *Rent Expense* into the future, as we actually "used up" that resource over time.

At the risk of repetition, I want to underline and emphasize the last one again, since it's one of the most important course themes, but the jargon here is a bit counterintuitive the first time: In this scheme, (non-cash) assets *are* 'Deferred Expenses.' As we learned in Chapter 2, in accounting, assets mostly *become* expenses later on. When we procure a resource that we will use over many periods, we first "write it up" as an asset, rather than expenseing, *precisely because* we wish to defer recognizing expense until the future periods, when we actually use it.

As such, in accounting, the choice of whether to **'capitalize as an asset vs. immediately expense'** is in fact a question of ***timing***—*when* do we recognize it as an expense? Do we record it as an expense *now*, right away, or record it as an asset *for now*, to *defer* as an expense, later?

7.2 Accruals, Cash, and Working Capital

Now, let's cover a variety of accrual-accounting transactions, some of which we've seen previously, but place them in this framework, and do a deeper, more conceptual analysis, to get some new insights. The bottom line of what we'll learn is this: The differences between accrual revenues / expenses and their related operating cash flows are 'stored in' **working capital** accounts (current assets and current liabilities). And so, as a result, we can "reverse engineer" a company's actual cash flows *from* its income statement and balance sheet accounts. Understanding how and why we can do this is the main goal of this section.

7.2.1 Revenue Transactions

Let's first consider all the ways in which our company can earn *Revenue*.

Accrued Revenue: Revenue recognized *before* cash is paid

This will happen whenever a customer pays "on account" or "on credit"—that is, with a promise to deliver cash later. This was Transaction #7 in previous chapters. Recall that, because there was a 'real' exchange (the good or service was provided), this is still an **external transaction**, even though no cash changes hands:

Accounts Receivable (+A)	$3.1k	
Revenue (+S.E.)		$3.1k

Service provided, customer pays on account, 10/1/2021

In the jargon of accounting, we say that the company has "accrued revenue"—it has earned it, and recognizes it, even though it has not collected the cash.

Later on, that customer will (we expect) eventually pay in cash. How do we account for that? **Start with cash.** Our company receives an **inflow** of Cash. And the customer will have then **fully discharged** their account. They will no longer owe us, so we will no longer have that **Receivable**. So we **credit A/R** to eliminate it.

Cash (+A)	$3.1k	
Accounts Receivable (-A)		$3.1k

Customer pays off their account in full, 2/1/2022

There are three **important takeaways** from this simple pair of transactions:

- **First**, note that **both** transactions here are **"external transactions,"** because there is a **real exchange** in both cases. When the company provides a good or service, that's an exchange. When the customer pays cash, cash changes hands. So there is an **accrual** here, but no internal transaction or adjusting entry. *Not every accrual* involves an adjusting entry. It depends on the specifics of the situation.

- **Second**, this simple pair of transactions illustrates a core accounting principle. **Over time, accruals should be 'reconciled' to actual cash flows.** Put differently, **differences between accruals and cash flows should 'revert' over time**. First the company *accrues* $3.1k in *Revenue*. Later it actually collects that amount in *Cash*. (If it doesn't, that's a problem, which we'll cover in Chapter 8.)

- **Third**, note how, in each part of the transaction, the change in *Accounts Receivable* is equal to the *difference* between the *Cash* received from the customer and the *Revenue* recorded. In the first part of the transaction, there's *Revenue*, but no *Cash*—and *Accounts Receivable* goes *up*. In the second part of the transaction, there's no *Revenue*, but the *Cash* is paid, and *Accounts Receivable* goes back down. To make this totally explicit, I like to re-write these journal entries, with extra, extraneous zeroes, like so:

Cash (+A)	\$0	
Accounts Receivable (+A)	\$3.1k	
Revenue (+S.E.)		\$3.1k

Service provided, customer pays on account, 10/1/2021

Cash (+A)	\$3.1k	
Accounts Receivable (-A)		\$3.1k
Revenue (+S.E.)		\$0

Customer pays off their account in full, 2/1/2022

We can see here that *Accounts Receivable*, a working capital account, **"spans"** or **"bridges"** or **"plugs"** the difference between the accrual quantity—the *Revenue*—and the actual cash flow **across time**. When we earn Revenue, without cash, it goes up, to store the difference—and when we get cash, later, it goes back down.

One **key application** of this is that it shows how we can go **from** *accrual-accounting* revenue *to* actual *cash collected from customers*, or vice versa, using the change in the *Accounts Receivable* account. **If we assume the company has no Deferred Revenue** (as we usually will for these quantitative problems, in this introductory course), then, on any given sale transaction, it must be that:

$$Revenue = Cash\ Collected\ from\ Customers + \Delta Accounts\ Receivable$$
$$Cash\ Collected\ from\ Customers = Revenue - \Delta Accounts\ Receivable$$

Since this identity holds on each transaction, it must hold across the sum of all transactions as well. And, the Financial Statements report the final balances of accounts, after all transactions. This means that we can infer how much cash a company actually received from customers over a period using its Income Statement and Balance Sheet accounts. Consider the example below:

Example problem: A company reported Revenues of \$100m in FY2021, but its reported **Accounts Receivable** *increased* from \$20m to \$50m from FY2020 to FY2021 (and it had no Deferred Revenue). Calculate the cash it collected from its customers in FY2021.

$$Revenue = Cash\ Collected\ from\ Customers + \Delta Accounts\ Receivable$$
$$\$100m = Cash\ Collected\ from\ Customers + (\$50m - \$20m)$$

$\$100m - \$30m = \$70m = Cash\ Collected\ from\ Customers$

An intuitive way to think about this is like so: 'If the company's **Accounts Receivable** increased by $30m, then it must be the case that $30m of its Revenues were credit sales, i.e., *not* paid in cash. So, of those $100m in *Revenue*, only $70m were cash sales.'[1]

While this may seem **esoteric** right now, I **promise it is not**. Many of the most important analyses in finance and general-management jobs are all about understanding a company's actual **cash flows** (because **"cash is king,"** and you have to pay the bank in cash, or else you can go out of business).

And this example shows how, if you understand accounting concepts, you can unravel that relationship, just using the main financial statements, the income statement and balance sheet. More practically, this is (a.) a nice **setup for a quantitative problem** to test your mastery of the concepts for **exams**, and (b.) the key to doing the **cash-flow statement**, later in the course. So it's definitely worth mastering.

Cash sale: Revenue recognized at the same time cash is paid

This one is easy, the most vanilla transaction. I'm just showing it for completeness. This was Transaction #6 in previous chapters:

Cash (+A)	$3.9k	
Revenue (+S.E.)		$3.9k

Cash Sale, 10/16/2021

In this case, because the customer pays in full, and the service is provided in full on the same day, there is no difference between the cash-basis sale and the accrual revenue. So this **one transaction** is the **full story** here. For a cash sale, there's no subsequent related adjusting entry or external transaction, because there's **no timing difference** between the activity and the cash flow. The date of the sale is the full story.

Deferred Revenue: Revenue recognized *after* cash is paid

In this case, customers pay cash *before* our company provides the actual good or service (Transaction #8). When the customer pays in advance, we do not recognize a revenue, because we have not yet earned it. Instead, we record a *liability* called **'Deferred Revenue,'** which represents our **obligation** to deliver on our side of the deal.

[1] Note that this verbal intuition is not perfectly correct, for the following reason: Customers can also pay off *past* accounts, and that will also affect (reduce) Accounts Receivable. The algebraic *identity* still holds ($Cash\ Collected = Revenue - \Delta AR$). The net difference between cash collected and revenues is equal to the net change in AR. But it's just harder to verbally express it that way.

Cash (+A)	\$0.8k	
Deferred revenue (+L)		\$0.8k

Customer Pays in Advance, 10/17/2021

The word **'deferral'** means the opposite of **'accrual'**. We have received the cash, but will **defer** recognizing a revenue until the future, when we actually **earn it**. (Just like an admitted student can **'defer' matriculation** for a year.)

Later on, when we actually provide the service, how do we account for it? On that date, we will actually **earn the revenue—a credit**. And then, because we will have delivered on **our side of the deal** we will no longer be obligated, or liable, to this customer. So, we'll **eliminate the liability** (with a debit, since liabilities are credit accounts).

Deferred revenue (-L)	\$0.8k	
Revenue (+S.E.)		\$0.8k

We provide the agreed service to those customers, 1/5/2022

The **key takeaway** here is to note the **perfect symmetry** with the issues we discussed in the accrued revenue transactions in the section above. *Accounts Receivable* is a current asset, while *Deferred Revenue* is a current liability. *Accounts Receivable* represents amounts of Revenue we have **earned, but not been paid**. *Deferred Revenue* represents amounts we have **been paid, but have not earned.**

And, in perfect symmetry to the previous example, **Deferred Revenue**, a short-term liability account, **"spans"/"plugs"/"stores" the difference** between the cash and the accrual-accounting revenue in each transaction, **across time**. To make this fully explicit, I'll once again write the journal entries with the extra zeroes:

Cash (+A)	\$0.8k	
Deferred revenue (+L)		\$0.8k
Revenue (S.E.)		\$0

Customer Pays in Advance, 10/17/2021

Cash (A)	$0	
Deferred revenue (-L)	$0.8k	
Revenue (+S.E.)		$0.8k

We provide the agreed service to those customers, 1/05/2022

Once again, a Balance Sheet working-capital account "spans" or "stores" the difference between the accrual revenue and the related cash flow.

7.2.2 Expense Transactions

Accrued Expense: Expense recognized *before* cash is paid

Recall that employees are typically paid every two weeks. In Chapter 4, we considered an example in which employees earned $.9k in salaries *per week*, and had their last **payday** one week **before** the **end of the reporting period.** As a result, as of the end of the reporting period, they had **earned**, but not been paid, $.9k in salaries. Our company had to account for that as an adjusting entry, like so (and note that I again include the **extraneous zero** line here, for **pedagogical** purposes):

Salaries expense (-S.E.)	$.9k	
Cash (A)		$0
Salaries Payable (+L)		$.9k

End-of-period Adjusting Entry for unpaid Salaries, 12/31/2021

In this case, we would say that the company has **"accrued"** a Salaries Expense. It has **incurred** the obligation, and owes its employees,who have earned their salaries, but not paid them yet. Once again, a short-term Balance Sheet account, ***Salaries Payable,*** "plugs" the difference between the accrual quantity and the cash flow.

Now, consider the **next payday**. How do we account for it? This one is tougher, but doable. **Start with cash.** The employees earn $.9k per week, so they get paid $1.8k in cash every two weeks. And, **since the last journal entry on 12/31**, they have *earned* another $.9k. Moreover, on payday, the company **fully discharges** its lagging obligation to its employees. So, the **liability** from the previous adjusting entry is **discharged**.

Salaries expense (-S.E.)	\$.9k	
Salaries payable (-L)	\$.9k	
Cash (-A)		\$1.8k

Next payday, 01/07/2022

This is the hardest transaction we have done yet: it has three lines, and it's hard to process mentally, all at once. But it's doable if we just break it down. Cash is cash—on each payday, \$1.8k is paid. The **expense** is about the actual ***activity***, how much the employees have ***earned*** since the last time an expense was recorded, one week prior. And, after this payday, the company no longer has an outstanding *Salaries Payable* obligation—it has discharged it in full by paying—so that account has to go back to \$0. Alternatively, if we can just solve for two out of the three, we know that the third line must balance the difference—the beauty of debits and credits, making our lives easier.

The big takeaway here is to note how, once again, a working-capital account, *Salaries Payable* (a current liability), "plugs" the difference between the accrual-accounting expense and the cash flow. By definition, *Salaries Payable* is amounts of salaries that our employees have earned but not been paid—and therefore, for our company, amounts of *Salaries Expense* that we have *incurred* but not paid out. This means that, symmetric to the example problem above, we can infer the actual cash paid for salaries using the *Salaries Expense* and the *Salaries Payable*.

Example problem: ExpoCorp reported *Salaries Payable* of \$120k on its FY2021 Balance Sheet, and \$140k for FY2022. On its Income Statement, it reported *Salaries Expense* of \$800k in FY2022. How much did ExpoCorp actually pay in salaries in FY2022?

Solution: ExpoCorp *incurred* \$800k in *Salaries Expense* over FY2022—that's how much its employees earned. But it didn't necessarily pay them in full, yet. Notably, ExpoCorp's *Salaries Payable* went up by \$20k over the period. This means that, on net, of the *Salaries Expense* it incurred, \$20k went unpaid over the period. Therefore, it must be the case that it paid only \$780k in cash for salaries over the period. Or, if you want a formula: $Cash\ Paid\ for\ Salaries = Salaries\ Expense - \Delta Salaries\ Payable$.

Accrued Interest

A transaction we haven't covered yet, but which illustrates a more commonsense use of the term *accrual*, is: **accrued interest**. Recall that our company got a *Loan* of \$10,000: **Transaction #2**. You probably know that we are charged *interest* on loans. To make things simple, suppose that we got that loan **halfway through the reporting period,**

July 1, 2022, and the loan requires **interest payments of 6% ($600) on an annual basis**, as long as the loan is **outstanding**.

Now, it's December 31, the end of our reporting period, and it's time to close the books. Because we have had this loan outstanding for half a year, we have **accrued interest**—but the full **interest payment** will not be due for another half year. So, there has been no "real" exchange or payment related to the interest, yet. But we must account for the interest that has *accrued over time*, as an adjusting entry. Below is the adjusting journal entry (again with the extraneous zero, for pedagogical purposes).[2]

Interest expense (-S.E.):	$300	
Interest Payable (+L):		$300
Cash (A):		$0

End-of-period adjusting entry for accrued interest, 12/31/2022

Now, it's next July 1 of the next year, and the first annual interest payment is due. The payment is an external transaction. How do we account for it? Start with Cash—we pay $600 in interest in cash, a credit. And, after making this payment, we have fully discharged the *Interest Payable* we recorded, so that liability must go back to a balance of zero, meaning we must debit it for $300. Finally, in the 6 months that have gone by since our last journal entry related to this loan, we incurred another half-year's-worth of *Interest Expense*—a debit of $300. (Alternatively, you can pin down just two of the lines, and solve for the third as the 'plug.') So, the journal entry would be:

Interest expense (-S.E.):	$300	
Interest Payable (-L):	$300	
Cash (-A):		$600

Paying annual interest payment, 7/1/2023

And, at the risk of repetition, note how, once again, a **working capital account** (*Interest Payable*, a current liability) is "spanning" or "bridging" or "plugging" the difference between the accrual expense and the related cash flow, over and across time.

Example problem: ExpoCorp reported *Interest Payable* of $20k on its FY2021 Balance Sheet, and $40k for FY2022. On its Income Statement, it reported *Interest Expense* of $50k in FY2022. How much did ExpoCorp actually pay in interest in FY2022?

[2] If our company made a loan *to* another company, so that we were entitled to receive annual interest payments, the situation would be the "flip side." We would *accrue* **Interest Revenue** and an **Interest Receivable (A)** over time, even before the cash interest payments were paid to us.

Expense recognized at the same time cash is paid

This will happen whenever the company pays for something in cash, and that thing is immediately recognized as an *expense* rather than an asset. When will this happen? Recall that we record expenditures as assets when they are resources that the company will use over multiple reporting periods. So, if the company buys something that it will completely use up in the short-term, in the same reporting period, we would **"immediately and fully expense"** that. Consider, e.g., the **electricity bill for our corporate headquarters**. We cannot **store** it. We immediately use it, as it is delivered to us. It is considered too difficult, if not impossible, to reliably match the costs of the electricity bills at corporate headquarters to individual sales and revenues. So, we would fully expense this when the costs are incurred, rather than capitalize as an asset. So, we record each **Utilities** bill solely as an expense.

Utilities expense (-S.E.)	$.2k	
Cash (-A)		$.2k

Pay our utilities bill, 1/15/2022

As in the case of the cash sale, there is no timing difference here, between the recording of the accrual quantity and the cash payment. Because of that, this is the end of the story, and there is no subsequent related external transaction or adjusting entry.

Deferred Expense: Expense recognized *after* cash is paid

Note that this is what happened with **all of the assets we discussed in Chapter 4**: **Prepaid Rent**, **Supplies**, etc. Those assets had **one "general form."** Below, I show the "general form" of the journal entries for operating assets, once again with the extraneous zero lines for illustrative purposes.

When we first purchase an asset, we record the full **"purchase price"** to the **Asset** account, and **do not** recognize an expense. Since we will use it over many periods, we defer recognizing the expense into the future, as we do.

Asset (+A)	$(Purchase Price)	
Expense (S.E.)	$0	
Cash (-A)		$(Purchase Price)

Purchase of Asset, date during reporting period
(External Transaction)

Then, over time, we account for the **amount used up** as an expense, though there is no more cash exchange.

Related Expense (-S.E.)	$(Amount Used Up)	
Cash (A)		$0
Asset (-A)		$(Amount Used Up)

End-of-period adjusting entry for expense related to asset, 12/31/2020

Once again, a Balance Sheet account "stores" or "spans" or "plugs" the difference between the cash flow and the accrual expense. If the above is too abstract, to make it concrete, consider, e.g., the case of *Prepaid Rent* (Chapter 4).

Example problem: ExpoCorp reported Prepaid Rent of $700k on its FY2021 Balance Sheet, and Prepaid Rent of $600k on its FY2022 Balance Sheet, and Rent Expense of $400k for FY2022. How much did ExpoCorp actually purchase in rent (that is, spend to procure additional leases) in FY 2022?

Answer: *Prepaid Rent* represents amounts of money that the company has spent on rental contracts, but not yet expensed out. ExpoCorp's FY2022 *Rent Expense* was $400k. But, its *Prepaid Rent* balance only went down by $100k over the period. Therefore, it must have spent an additional *$300k* on rental contracts.

7.2.3 Generalizing: Cash, accruals, and "working capital"

So, in all of the examples we saw above, we saw how the difference between the **operating cash flow** and the **accrual revenue or expense** was "stored in" **changes** in current asset or current liability accounts—*Accounts Receivable (A)*, *Deferred Revenue (L)*, *Salaries Payable (L)*, *Interest Payable (L)*, *Prepaid Rent (A)*, etc. Recall from last chapter that we call current asset and current liability accounts "working capital accounts," and define "net working capital" as:

$$Net\ Working\ Capital = Current\ Assets - Current\ Liabilities$$

'Working Capital' is an absolutely ubiquitous, key term and concept in business and finance. And, with the work we just did above, we can now understand *why*. As users of financial statements, we don't see the individual transactions, we just see their aggregated effects on the financial statements: From that vantage point, we know that the difference between net income vs. related cash flows will be largely explained by changes in those accounts, and **working capital** as a whole. (This is largely what the **Cash Flow Statement** will be all about.) And many business and financial analysis

applications center on understanding this—what drives the difference between net income and cash flows—to forecast future cash flows, to see if the company can pay its debts and stay in business. For a seasoned financial professional, the concept of working capital is as familiar, ubiquitous, and useful as "copy and paste."

7.3 Accrual Accounting x Internal Transactions

Let's talk about the relationship between **accrual accounting** and the **"internal transactions" / "adjusting entries"** companies make at the end of the reporting period. The two concepts are *related* in important ways. But some students **overthink it**, and this can lead to confusion.

7.3.1 The Relationship Between the Two

External vs. Internal: Earlier, we defined **"external transactions"** as **"real" exchanges** of things or services, between our company and some external party. And we defined **"internal transactions" / "adjusting entries"** as **"everything else"** a company has to do in order to update its accounts before closing the books. The adjusting entries we've seen so far had to do with how certain assets are "used up" over time, or how certain liabilities (e.g., salaries or interest) *accrue* over time, before they are paid.

Accrual accounting: Accrual accounting is defined by way of contrast to **cash-basis accounting**, in which we only account for cash transactions—payments and receipts. And all **cash transactions** are, necessarily, **external transactions**—real exchanges.

Relationship: Therefore, since **all internal transactions / adjusting entries** are non-cash, they all ultimately have to do with **accrual accounting**—with the fact that we do not *only* account for cash payments and receipts.

In short, **all adjusting entries have to do with accrual accounting**. But that relationship **doesn't really go both ways**. Companies can have ***accruals* that don't involve any internal transactions or adjusting entries**. For example, as we saw, when a company makes a **credit sale**, it *accrues revenue* before the cash is paid. That sale is an **external transaction.** Later on, when the **customer pays off their account**, that is **also** an external transaction, since there's a real exchange of cash.

So, it's a **rectangle-square** situation. Every internal transaction has to do with accrual accounting. But not every accrual or deferral involves an internal transaction.

More generally, we don't need to make any end-of-period internal transactions / adjustments of accounts related to transactions where there's nothing "left over"—if

the external transactions were a full accounting. This will happen whenever:

1. a cash transaction and the related accrual revenue or expense recognition happen at the same time (e.g., cash sale, or an immediately-expensed item);

2. they don't happen at the same time *but* the difference between them is fully accounted for in external transactions (e.g., credit sale, which is later paid off).

I emphasize this to anticipate confusion, because many students **overthink it**. They see some accrued quantity—**Accounts Receivable**, or **Accounts Payable**—on the books at the end of the reporting period, and think they're supposed to **do something**.

Nope. We **adjust** some assets and liabilities that are **used up or discharged over time**. Others we don't. E.g., unlike *Interest Payable*, *Accounts Payable* doesn't change *over time per se*—that account gets updated if and when we actually incur and pay our bills, both of which would be external transactions. In cases like those, at the end of the reporting period: "Don't just do something—stand there."

7.3.2 External vs. Internal: What really *is* the difference?

Some first-time students get a bit **hung up** on "philosophical" questions about what really is an external or internal transaction. The truth is, sometimes, the boundary between the two is fuzzy. But in these **cases, it doesn't really matter**. All that matters is that we **report the financial statements correctly** at the end of the reporting period.

Remember that the company doesn't really "have" financial statements until then. So, all that matters, is that if we *don't* account for something **as an external transaction,** we *do* account for it as an **adjusting entry,** before closing the books.

Consider the **Deferred Revenue** example we referenced above. There, a customer **paid in advance** (debit Cash, credit Deferred Revenue) and later on, we provided the service (debit Deferred Revenue, credit Revenue). In the case of that example, we accounted for **both** of those as "real" exchanges, external transactions.

Now, suppose you were a lawyer, and, on July 1st, a customer pays $10k up front to have you **"on retainer"** for a year. A "retainer contract" means that the client pays for the **right to call upon you** and **prevent you from representing any of his or her enemies** over the agreed period of time.

How do we account for this contract? Well, the *initial transaction* is surely an external transaction, because $10k in cash is paid:

Cash (+A)	$10k	
Deferred revenue (+L)		$10k

Customer Pays for 1-year retainer contract, 7/1/2022

What next? **When** do you, as the lawyer, **recognize revenue** from this contract? Your obligation was to be available to your client, to be on call. There's not necessarily going to be any *particular moment* of "real exchange"—or, in more reductive accounting terms, anything that will 'trigger' you to update your books.

But, at the end of the year, December 31, you will have to close your books. And, with half a year gone by, you would have earned half of your retainer contract—you would have satisfied half of your **'performance obligation' (jargon)** to be available and loyal to that client for one year. So, in this case, it seems logical to account for half of that retainer contract as *Revenue* as an **internal transaction** / adjusting entry at the end of the reporting period.

Deferred revenue (-L)	$5k	
Revenue (+S.E.)		$5k

Adjusting entry for half year of Retainer Contract, 12/31/2022

As this pair of contrasting examples shows, the account itself or general transaction type (in this case, *Deferred Revenue*) won't tell you whether a transaction is external or internal. You have to think about the specifics of the situation, and what makes sense.

Some students **argue** that every day that **employees work**, that's an **exchange**. So, they argue, the company should account for the accrued *Salaries Expense* and *Salaries Payable* every day before the payday. On **philosophical grounds, this argument has merit**. But, then again, **what's the point of doing all that work?** Why put all this effort into updating an income-statement *expense account* on a daily basis, that will never be seen or used by anyone? And, where would this argument end? Couldn't you think of each and every *hour* that employees work as an exchange? Each *minute*? So, why not just wait until the end of the reporting period to fully update it?

So, while the question here is not a totally scientific one, here are some reasonable rules-of-thumb that apply in my text, and seem to also apply to the official textbook (Spiceland, *Financial Accounting*, 5e). We can assume, by default, that companies do not update their employee-salaries and utilities-related accounts outside of paydays and the end-of-period adjusting/internal entries. So, for those accounts, the **paydays** are **external transactions** and everything else is an **internal / adjusting entry**.

7.4 Connecting the Income Statement and Balance Sheet

With the transactions that we have covered so far, we're now in a better position to understand the deep links between the two primary financial statements, the Income Statement and the Balance Sheet, which is one of the core course themes.

7.4.1 Earning Revenue from increasing assets

Consider the first two revenue-generating Transactions our company made, #6 and 7. In the first, the company sold services for cash, and we accounted for it like so:

Cash (+A)	$3.9k	
Revenue (+S.E.)		$3.9k

Cash Sale

In the second, the company sold services on account (in exchange for the customer's promise to pay later), and we accounted for it like so:

Accounts Receivable (+A)	$3.1k	
Revenue (+S.E.)		$3.1k

Credit Sale

In both cases, the Revenue, is balanced by / linked to a change in an asset account—either Cash or A/R. Of course, we know these journal entries well by now. The important thing here is how this provides a deep way to *think about* accounting. Instead of thinking about A/R as a 'plug' account, you could instead look at it this way: "An increase in Assets generated from our operations/sales ***is*** a Revenue. Revenues *are* increases in net assets created by our operations, whether the asset is *Cash* or *A/R*."

Or, going deeper, consider the following example, in which we get a **combination of *Cash* and *A/R* in a sale**: Suppose that a customer buys $1k in goods from us, but only pays $600 now, and promises to pay the other $400 later. Since we have provided the good, we have earned revenue. But we have only received $600 in cash. We account for this like so:

Cash (+A):	$600	
Accounts Receivable (+A):	$400	
Revenue (+S.E.):		$1000

Sale Partly in Cash, Partly on Credit
Customer Pays in Part

The first thing we learned in this example is that we can have a sale transaction with a combination of Cash and A/R, and therefore three lines in the journal entry.

(The rule is that the total **dollar value** of **debits equal** that of credits.) But there's also a more general insight here. There are two useful ways to *see* this one transaction:

- $Revenue\,Earned - Cash\,Collected = \Delta Accounts\,Receivable$: "We have earned \$1,000 in Revenue, but the customer has only paid \$600 to us. So we have an entitlement to receive the difference later. Accounts Receivable 'plugs' the difference over time."

- $Revenue\ Earned = \Delta Accounts\ Receivable + Cash\ Collected$: "From our sale, we have **obtained two assets**: (1.) The \$600 in **Cash, an asset**. (2.) The customer's promise to pay \$400 later. That **promise is an asset**. So, to **calculate our revenue, we add up the two assets we have gained**: $\$600 + \$400 = \$1,000$."

The former of those two views, could be called the "Income Statement perspective" — focusing first on income-statement quantities, and how those 'flow' into the B/S.

The latter of those two views is what is sometimes called the "**Balance Sheet perspective**" — focusing first on the measurement of Balance Sheet accounts (assets and liabilities), and then *thinking about* revenues and expenses as changes in those B/S accounts. It's a bit more "old school." For the old-school profs and texts, the way they think about this transaction is: "We have gained assets (*Cash* and *A/R*), and accounting is all about reporting the Balance Sheet asset and liability accounts, and therefore correctly reporting our **net assets**. The *Revenue* on our income statement is a just a 'plug' explaining how the change in those net assets arose."

But those are just two ways of *looking at* the same transaction, and it's all based on accounting identities and linkages. So neither view is correct or incorrect. But it can enrich our understanding of accounting to keep both views in mind at once (like the "duckrabbit"). And I promise it will be practically useful later, when we cover harder issues and transactions. In the more advanced sections of the course, we'll see several cases where companies have a **choice of method** for accounting for some **gnarly issue**. In those cases, we can often only understand those differing methods—the implementations, interpretations, and tradeoffs—in this framework, of 'income-statement vs. balance-sheet perpsectives.' So, it's worth getting comfortable with it.

7.4.2 Earning Revenue from decreasing liabilities

But the transactions immediately above, in which the *Revenue* was linked to increases in assets, are not the only ways a company can **generate revenue**. The other way is to 'earn out' a ***Deferred Revenue*** liability, as we saw earlier:

Deferred revenue (-L)	\$0.8k	
Revenue (+S.E.)		\$0.8k

We provide the agreed service to those customers, 1/5/2022

That is, earning a *Revenue* can also be linked to a **decrease** in a *Liability*. Now, with this, we've described **all possible ways** in which a company can earn *Revenue*—since the cash has to be paid either before, at the same time as, or after the sale. We sometimes use the term **"net assets"** in accounting to denote the total **Asset minus Liabilities** (**jargon**). So **fully general definition** of a Revenue is:

> **Revenue:** "An increase in *net assets* (i.e., an increase in assets and/or a decrease in liabilities) earned from our operations (sales)."

This can also help us better understand the connection between the worlds of the Income Statement and the Balance Sheet. Here's one way to visualize this:

↑ **Revenue** ← **Transactions** → (↑ **Assets** or ↓ **Liabilities**)
↑ **Revenue** → ↑ **Net Income** → ↑ **Retained Earnings** → ↑ **Shareholders' Equity**
(↑ **Assets** or ↓ **Liabilities**) → ↑ **(Assets-Liabilities)** → ↑ **Shareholders' Equity**

What this visual represents is that the *same underlying transactions* (sales) that generate **Revenues** also either increase **Assets** or decrease **Liabilities**. **Revenues** positively contribute to Shareholders' Equity via the **Net Income definition** and **Retained Earnings** identity. And increasing your Assets, or decreasing Liabilities, also do, according to the **Accounting Equation** ($E = A - L$).

7.4.3 Expenses from decreasing assets or increasing liabilities

Pushing even further, recall that **Expenses** are just "**anti-revenues**." And everything is **beautifully symmetric**. So far, we've seen **two ways in which a company can incur an expense**:

1. By **reducing an Asset**: e.g., spending **Cash** on **Utilities**, or "using up" **Prepaid Rent** (and crediting it as an adjusting entry).

2. By **increasing a Liability**: e.g., *accruing* a liability for employee salaries, or paying for an expense *on account* (Accounts Payable).

So, the **fully general definition** of an *Expense* is:

> **Expense:** "A decrease in *net assets* (i.e., a decrease in assets and/or an increase in liabilities) incurred from our operations."

7.4.4 Linking the Income Statement and Balance Sheet

And so, finally, the most general way of visualizing the connection between the Income Statement and the Balance Sheet is like so:

↑ **(Revenues-Expenses)** ← **Transactions** → ↑ **(Assets-Liabilities)**
↑ **(Revenues-Expenses)** → ↑ **N.I.** → ↑ **Retained Earnings** → ↑ **S.E.**
↑ **(Assets-Liabilities)** → ↑ **S.E.**

Every transaction that affects Revenues or Expenses also affects Assets or Liabilities in balancing, opposite ways. And the differences between the two both **flow into** Shareholders' Equity equally. Everything stays in sync. **It's a beautiful system**.

8

Receivables Part 1: Accounting for Uncollectible Accounts

So far, we've always assumed that when companies make credit sales, they will be paid back in full. And we've accounted for those transactions like so:

Accounts Receivable (+A):	$6,000	
Revenue (+S.E.):		$6,000

Credit Sale

Cash (+A):	$6,000	
Accounts Receivable (-A):		$6,000

Collecting on the Account

But, a truth that we've avoided confronting, so far, is that the **future is never knowable with certainty**. There's always **risk**. And there's always **credit risk**—that we won't be able to collect what we are owed. Some customers might be truly **unable** to pay—unexpected contingencies might send them into bankruptcy. And some customers might just be ***sus***. They might decide they don't need to do business with us anymore, refuse to pay their last bill, and ask, essentially, 'What you gonna do about it?'

It's time to account for that. And we need to. A core accounting principle is that **accrual quantities** (such as *accrued revenue and receivables* from credit sales) and **cash flows** must eventually be **reconciled**. So, if we sell $6k of services *on account*, and book that full amount towards our bottom-line profit, but then 15% of our customers never actually pay, that's a **problem**, a violation of this core accounting principle. So, we need a way to **account for "Uncollectible Accounts."** That's what this chapter is about.

In the previous chapters, for the introductory phase of this course, the text tried to lay out one simple, clean **"right answer"** for each issue we encountered—*the* way to account for some transactions. We are now in the intermediate phase of this course. That means covering precisely those areas where things are **not so simple**.

It turns out, companies have a **choice of different allowable methods** for accounting for uncollectible accounts. The same company's financial statements, including bottom-line net income, could be different in any given period, depending on the method it chooses. And, further, in my opinion, of the two allowable methods, one method is not obviously better than the other. There are tradeoffs—each method achieves one accounting goal, but fails on another, and there is no way to achieve everything we desire simultaneously. That's what makes this interesting.

8.1 Goals:

The exact 'mechanics' of the methods will be a bit gnarly. So, let's start reasoning at a higher level, about how we *should* account for this. Logically, we want two things:

- **Goal #1, Account for *expected* credit losses on sales each period:** First, it seems logical that, when we sell **on account**, and expect some losses, we should not count the full amount toward bottom-line net-income. Instead, before reporting our financial statements, we should **estimate** our **expected losses**—and that amount should **not** contribute to net income.

- **Goal #2, Account for 'surprise' realized collections:** The future is never perfectly predictable. This means that we will almost certainly **end up** collecting either **more or less** on our credit sales than we expected. Call that difference the 'surprise' or the 'news.' So, e.g., if we had **expected** to collect $4k of our credit sales, but **actually** collect $5k, then the 'surprise' would be $1k (good news). But if we **actually** collect $3k, the 'surprise' would be –$1k (bad news). It seems logical that this 'news' should also be factored in somehow.

8.2 Overview of Methods

In the sections below, we'll cover three different methods for accounting for uncollectible accounts, in detail, describing the rules for each method, and accounting for the same set of transactions using each. For now, a brief preview and verbal description of each, before we get into the dirty technical details. The three methods are:

- **1) The "Direct Writeoff Method"**: Under this method, we don't make any allowance for uncollectible accounts when we make a credit sale *per se*. Instead, if and when we determine that a customer will not pay, due to, e.g, bankruptcy—then and only then we "write off" their account, and record a "Bad Debt Expense." Thus, I like to call this the **"wait and see method."**

- **2) The "Percentage of Credit Sales Method"**: Under this method, every period, we "make an allowance" for *expected* losses on credit sales we made in that period and record a "Bad Debt Expense." That's it. That's all. Really. It's often called the **"Income Statement method,"** because the *Bad Debt Expense* is based on the 'flow' of credit sales in that same period. Later on, in future periods, if and when particular customers declare bankruptcy, and we learn that we'll actually collect less than expected, what do we do? Under this method, *nothing*. We already "allowed for" that, factoring in expected credit losses as best as we could. Thus, I call this the **"make our best guess and keep moving method."**

- **3) The "Allowance Method"**: Under this method, during the period, if a customer declares bankruptcy, we "write off" their account at that time; and then, at the end of every reporting period, we focus our attention on correctly estimating the *balance* of an *"Allowance for Doubtful Accounts."* This *Allowance* is a contra-account to *Accounts Receivable*, and, under this method, tracks what portion of our still-outstanding accounts we expect we will *not* collect. This method is often called the **"Balance Sheet method,"** because the focus is on correctly estimating the "stock" / Balance Sheet measure of ***Net*** *Accounts Receivable*—the total amount we expect to eventually collect.

In the next section, I'll lay out a very simple example scenario and set of transactions involving credit sales, collections, and uncollectible accounts, across two reporting periods. Then, in the sections that follow, I'll show how to account for these transactions under each of the three methods, sequentially. Finally, for each method, I'll also calculate and discuss the key ***summary measures*** related to credit losses, the ***Net*** *Accounts Receivable* reported on the Balance Sheet, and the *Bad Debt Expense* reported on the income statement, to assess the implications of these methods.

8.3 Scenario

Below is the scenario we will use. MattCo is a simple company that starts its life in 2021, does annual, calendar-year reporting, and has the following events in FY '21 and '22:

- **11/10/'21**: MattCo starts up & sells $2m of textbooks to **StudentCo** on account.
- **12/01/'21**: MattCo sells $8m of textbooks to misc **other customers** on account.
- **03/03/'22**: All of MattCo's **other customers pay** off their accounts in full—$8m.
- **03/17/'22**: **StudentCo** collapses and declares **bankruptcy**.

In each case, we'll assume that MattCo has information to indicate that $9m of the credit sales / outstanding accounts made in 2021 will be collected.

Therefore, **an even more distilled summary** of this scenario is this: In the first year, MattCo makes $10m of credit sales, and has reason to believe $9m will be collected. In the second year, MattCo actually collects $8m (a 'surprise' of -$1m).

8.4 Direct Writeoff Method

As the name indicates, under this method, instead of forming an initial forecast / expectation of what portion of accounts receivable will ultimately be uncollectible, we just **"write them off" at the time** when we decide that those **particular accounts** are uncollectible. (For simplicity, in this text, the trigger for this will be the customer filing for bankruptcy.) In accounting, "writeoff" is an informal but common term for "setting an account back to zero" and/or "acknowledging that some asset no longer has value."

When we determine that some particular *Accounts Receivable* are in fact uncollectible, that means that asset must be eliminated from our books, with a *credit* to A/R. What's the balancing debit? It's a new one. We call it **"Bad Debt Expense,"** for self-explanatory reasons. So, under this method, we only account for the **sale** itself, the collections, and the **day of the writeoff**, on the days on which they actually happen—all external transactions.

8.4.1 Direct Writeoff Method Rules

Summarizing, we can reduce the *Direct Writeoff Method* to these **Rules**:

- **Rule #1**: Account for both *credit sales* and *collections* like normal, like we've done so far. (That is, on the date of the credit sale, debit *A/R* and credit *Revenue*. On the date of the collection, debit *Cash*, credit *A/R*.)

- **Rule #2**: If and when we determine that some customer will not pay (triggered by the customer declaring bankruptcy), "write off" that account by crediting *A/R*, and debiting *Bad Debt Expense* for that amount.
- **Rule #3**: Since, under this method, we "wait and see" and just account for collections and writeoffs when they happen, there is **no related adjusting entry**.

8.4.2 Direct Writeoff Method Accounting

Therefore, the journal entries for the scenario above would simply be:

Accounts Receivable (+A):	$2m	
Revenue (+S.E.):		$2m

11/10/'21 Credit Sale to Student Co.

Accounts Receivable (+A):	$8m	
Revenue (+S.E.):		$8m

12/01/'21 Credit Sale to Other Customers

Cash (+A):	$8m	
Accounts Receivable (-A):		$8m

3/03/'22 Collection on Other Customers' Accounts

Bad Debt Expense (-S.E.):	$2m	
Accounts Receivable (-A):		$2m

3/17/'22 Write Off StudentCo

8.4.3 Evaluating the Direct Writeoff Method

The direct writeoff method is not allowed under GAAP for financial reporting purposes (though can be used for tax reporting). Why not? As the simple example above shows, **this method fails on Goal #1, above.** We should *expect* that some of our credit sales will not be collected. And this system **does not account** for that, in the period in which those sales are made. Therefore, it is a **violation of the matching principle**.

Quantifying, the key measures related to uncollectible accounts—*Net Accounts Receivable* and the *Bad Debt Expense*—using this method would be:

	Bad Debt Expense	*Net Accounts Receivable*
FY 2021	\$0m	\$10m
FY 2022	\$2m	\$0m

In **FY '21**, under this method, the ***Net Accounts Receivable*** we would report would be the full **\$10m**—because we credited all of those sales to *A/R* in full, without making an allowance for expected credit losses. Relatedly, the ***Bad Debt Expense*** in FY '21 would be **\$0**, so all \$10m from those credit sales would directly count toward bottom-line net income in that year. Therefore, because we did not account for expected credit losses, we arguably overstated our net assets and net income in FY '21.

8.5 I/S Method: Percentage-of-credit sales

Under this method, in each period, the company records a *Bad Debt Expense* as a simple **percentage** of its total **credit sales in that period**. The matching credit is to a new account called the ***"Allowance for Doubtful Accounts."*** This account is a **contra-account** to *Accounts Receivable*. That is, it is a separate account that tracks a *"negation"* in the value of the *A/R*, "allowing for" the fact that not all of those accounts will be paid.

Now, we need a bit of **jargon**: We use the term **Net Accounts Receivable** to indicate the **total Accounts Receivable minus the total Allowance**. (This is a common pattern in accounting: **'Net'** indicates the balance of an account *less* the balance of some related reduction, such as its contra-account.) Formally:

$$Net\ Accounts\ Receivable = Accounts\ Receivable\ (balance) - Allowance\ (balance) \quad (8.1)$$

And, in fact, it is this number, the ***Net*** *Accounts Receivable*, that is actually **reported** on the Balance Sheet—a detail we omitted from the earliest chapters, to simplify.

8.5.1 I/S Method Rules

Now, let's lay out the rules formally, and then apply them to the scenario above. Here are the rules for the *Percentage-of-Credit Sales* method:[1]

[1] Also, test your knowledge of the rules in general with this practice problem: Our company accounts for bad debts / receivables using the **percentage-of credit-sales method**, assuming 15% of credit sales will be uncollectible. We began FY2020 with a balance of \$150k in Accounts Receivable. During FY2020, we made an additional \$100k in credit sales, and collected \$60k on accounts from past credit sales. Customers with accounts totaling \$20k declared bankruptcy. What would be our FY2020 Bad Debt Expense?

- **Rule #1**: During the reporting period, account for both *credit sales* and *collections* just like we've done so far. Don't overthink it and worry about expected credit losses just now—we'll deal with that as an adjusting entry.
- **Rule #2**: At the end of the reporting period, **as an adjusting entry**, account for expected credit losses as a **given percentage of the credit sales made during that period**, debiting *Bad Debt Expense* and crediting the *Allowance*.
- **Rule #3**: During the period, if and when our customers declare bankruptcy, **do nothing**. We do not update our *Net Accounts Receivable* or *Bad Debt Expense*. We already "allowed for" expected losses. We did our best (shrug), and keep moving.[2]

So, distilling those rules down even further, **in short, we just record a *Bad Debt Expense* and add to the *Allowance* based on the flow of credit sales each period.**

8.5.2 I/S Method Accounting

Now, let's revisit our scenario above, and account for it under the **percentage-of-credit-sales method**, with the **assumption that 10% of credit sales** will be uncollectible. As a refresher, here's our scenario:

- **11/10/'21**: MattCo starts up & sells $2m of textbooks to **StudentCo** on account.
- **12/01/'21**: MattCo sells $8m to misc **other customers** on account.
- **03/03/'22**: MattCo's **other customers pay** their accounts in full—$8m.
- **03/17/'22**: **StudentCo** collapses and declares **bankruptcy**.

So, the journal entries during the period in 2021 would be:

Accounts Receivable (+A):	$2m	
Revenue (+S.E.):		$2m

11/10/'21 Credit Sale to Student Co.

[2]Note: Some other texts teach that, under the percentage-of-credit-sales method companies do account for writeoffs by reducing both *A/R (A)* and the *Allowance (contra-A)*. However, given that companies only report *Net Accounts Receivable* (total *A/R* minus the *Allowance*), and, under, the I/S method, the end-of-period adjusting entry for the *Bad Debt Expense* and update to the *Allowance* is only based on the same period's incremental credit sales, this adjustment is nominal, with no substantive impact on the key reported measures, the *NAR* or *Bad Debt Expense*. Therefore, this question is purely procedural, and all the key substantive ideas here—e.g., showing the income-statement method does not factor "surprise" (unexpected) collection into the next period's BDE or NAR—hold regardless of which procedure is used.

Accounts Receivable (+A):	$8m	
Revenue (+S.E.):		$8m

12/01/'21 Credit Sale to Other Customers

Now, it's time for our December 31 adjusting entry, before we we close the books. We made $10m of credit sales this period, and we're told to assume that 10% will be uncollectible. So the adjusting entry would just be...:

Bad Debt Expense (-S.E.):	$1m	
Allowance for Doubtful Accounts (+contra-A):		$1m

12/31/'21 Adjusting Entry for Expected Bad Debts

Now, move on to 2022. First, we collect on the other customers' accounts:

Cash (+A):	$8m	
Accounts Receivable (-A):		$8m

3/03/'22 Collection on Other Customers' Accounts

Now, on March 17, StudentCo declares bankruptcy. What do we do? Under this method: Nothing. Under the percentage-of-credit sales method, there's effectively no such thing as "write-offs." We *already* allowed for the *expected loss*. So, we don't update our *Net Accounts Receivable* or *Bad Debt Expense* now. We already **made our best guess, so we keep moving**. So, after March 17, 2022, our *Accounts Receivable* T-account and its related *Allowance* will still look like this:

Accounts Receivable (A)

Debits	Credits
11/10/'21: $2m	03/03/'22: $8m
12/10/'21: $8m	
Bal: $2m	

Allowance (contra-A)

Debits	Credits
	12/31/'21: $1m
	Bal: $1m

That's all for this method. There's no FY22 adjusting entry required, because there were no new credit sales during 2022—and, at the risk of repetition, under the *percentage-of-credit-sales* method, the *Bad Debt Expense* and the credit to the *Allowance* are only and solely determined by the credit sales made during that period. Therefore, those are the final account balances for FY22, and *Net Accounts Receivable* is $1m.

8.5.3 Evaluating the Percentage of Credit Sales Method

We already verbally previewed the problems with this method. Now let's add rigor by quantifying the key measures related to uncollectible accounts that would be reported in each period, under this method: the *Bad Debt Expense* (the 'flow' / Income Statement measure) and the *Net Accounts Receivable* (the 'stock' / Balance Sheet measure).

As a reminder, the scenario here was:

- **11/10/'21**: MattCo starts up & sells $2m of textbooks to **StudentCo** on account.
- **12/01/'21**: MattCo sells $8m to misc **other customers** on account.
- **03/03/'22**: MattCo's **other customers pay** their accounts in full—$8m.
- **03/17/'22**: **StudentCo** collapses and declares **bankruptcy**.

And, gathering from the above, the key measures under this method, with 10% of credit sales assumed uncollectible, would be:

	Bad Debt Expense	*Net Accounts Receivable*
FY 2021	$1m	$9m
FY 2022	$0m	$1m

So, what do we think? Does this method make sense?

Clearly, this method initially **succeeds on Goal #1**. We account for expected credit losses in FY21, recording a $1m *Bad Debt Expense*. But we clearly **fail on Goal #2**. We expected only $1m in credit losses. But in FY22, our customers with accounts worth $2m went bankrupt. So, it now looks like our actual realized credit losses will, in fact, ultimately be $2m, a "surprise" of -$1m, but we don't make any adjustment or update for that. Across **both periods combined**, FY21 and FY22, our ***total*** *Bad Debt Expense* is $1m.

Turning to the Balance Sheet, as of the end of FY22, the *Net Accounts Receivable* on our books is still $1m—even though all of our customers have either paid or declared bankruptcy. Because we don't make adjustments, under the *Percentage-of-Credit Sales* method, *Net Accounts Receivable* became obviously misstated by the end.

While this is a stylized "toy example" for pedagogical purposes, this facts holds true in general, in the real world. The percentage-of-credit sales method is often called the **"Income Statement method"** because it gives us a reasonable measure of the *expense* from expected credit losses each period, matched to those same period's sales. But, precisely because it does not factor in subsequent "surprise" collections and losses, the "stock" measure of *Net Accounts Receivable* on the Balance Sheet—the amount of our outstanding accounts that we expect to collect—becomes misstated over time.

This brings us to our next method, the *Allowance Method*.

8.6 The B/S Method / The Allowance Method

This method is harder to summarize verbally. Broadly, this approach, in contrast to the previous, is often referred to as the **"Balance Sheet Method,"** because we focus our attention on correctly estimating, updating, and reporting *Net Accounts Receivable*—the Balance Sheet / "stock" measure. But, as we know, Balance Sheet and Income Statement are **intimately linked**. So, under this method, the *update* to the *Allowance* that we make at the end of the period will determine our *Bad Debt Expense*. And that number, it turns out, will *simultaneously* incorporate the effects of (i.) expected losses on new accounts and (ii.) "surprise" collections on past credit sales.

Understanding exactly *how* is hard. So, let's first lay out the **rote rules**.

8.6.1 B/S Method Rules

- **Rule #1**: During the reporting period, account for both *credit sales* and *collections* just like we've done so far. Don't overthink it—we'll factor in expected uncollectible accounts as an adjusting entry, at the end of the period.
- **Rule #2**: During the period, when our customers declare bankruptcy, account for this by **extinguishing the account** (that is, crediting *Accounts Receivable*) and "using up" the *Allowance* we made (as the matching debit).
- **Rule #3**: At the end of the reporting period, estimate what *remaining outstanding accounts* we expect not to collect. **Adjust** the *Allowance for Doubtful Accounts* **balance** to that number. The matching debit is the *Bad Debt Expense*, by definition.
- **Rule #4**: Obey rules #1 - #3. Resist the temptation to stray. The most common mistake I see from students come from "overthinking it"—in particular, students try to account for the *concepts* of expected losses on each credit sale, i.e., during the reporting period. Don't. Trust the process. The "mechanics" of the adjusting process will take care of that for us, if we just follow Rules #1-#3.

8.6.2 Scenario and Assumption: Percentage-of-Receivables

Now, let's account for our scenario using this method. As a refresher, it is:

- **11/10/'21**: MattCo starts up & sells $2m of textbooks to **StudentCo** on account.
- **12/01/'21**: MattCo sells $8m to misc **other customers** on account.
- **03/03/'22**: MattCo's **other customers pay** their accounts in full—$8m.
- **03/17/'22**: **StudentCo** collapses and declares **bankruptcy**.

Now, let us suppose our company **assumes that 10% of outstanding accounts** at the end of each period will be **uncollectible**. That is, it estimates the allowance based on a simple **percentage-of-receivables**. (Later on, we'll find that that companies can use other, more complicated methods for estimating the uncollectible amounts.)[3]

8.6.3 B/S method accounting

The external transactions in 2021 would be:

Accounts Receivable (+A):	$2m	
Revenue (+S.E.):		$2m

11/10/'21 Credit Sale to Student Co.

Accounts Receivable (+A):	$8m	
Revenue (+S.E.):		$8m

12/01/'21 Credit Sale to Other Customers

Now, it's time for our December 31 adjusting entry, before we we close the books on 2021. We know that we are assuming that 10% of outstanding accounts will be uncollectible. And, under this method, we simply need to adjust our *Allowance* to that balance. And the current balance of the *Allowance*, before the adjusting entry, is $0m, since the company just started its life, and none of the transactions to date involved

[3]Note that, in this simple toy example, of a firm that starts its life and just makes two credit sales (and has no collections) in 2021, the amount of *outstanding receivables* at the end of the period ($10m) is the same as the the amount of credit sales made during that period. But, this equality will not hold in general—usually, the total ***outstanding*** *Accounts Receivable* (a stock amount) will not be the same as the flow of credit sales made in that period. And so, assuming 10% of the stock of outstanding receivables will prove uncollectible (under the B/S method) is a substantively different assumption than assuming that 10% of the flow of credit sales will be (under the I/S method).

the *Allowance*. Our current balance of *Accounts Receivable* is \$10m, meaning that the **new ending balance** of our *Allowance* must be \$1m.

So, in sum, we need to **update the *Allowance*** from \$0 to \$1m. And, the matching debit is the *Bad Debt Expense*, by definition. So, the adjusting entry would be:

Bad Debt Expense (-S.E.):	\$1m	
Allowance for Doubtful Accounts (+contra-A):		\$1m

12/31/'21 Adjusting Entry for Allowance for Uncollectible Accounts

So, for 2021, so far, things are the same as they were under the percentage-of-credit-sales method. But they won't stay that way. Now, move on to 2022.

First, we collect on the other customers' accounts:

Cash (+A):	\$8m	
Accounts Receivable (-A):		\$8m

3/03/'22 Collection on Other Customers' Accounts

Then, StudentCo declares bankruptcy, so we now can be reasonably confident that they will not actually pay their \$2m account. Under the **percentage-of-credit sales** method, we did nothing. But under the *Allowance* method, we do something. We "write off" the account by (i.) extinguishing (crediting) *Accounts Receivable*, and (ii.) "using up" the *Allowance*, as the matching debit. (Recall that the *Allowance* is a contra-asset account, so it is a credit account, so reducing the *Allowance* is a debit.)

Allowance for Doubtful Accounts (-contra-A):	\$2m	
Accounts Receivable (-A):		\$2m

3/17/'22 Write Off StudentCo

Now, finally, it's December 31, 2022, time to make the adjusting entries and close the books for the year. Under the *Allowance* method, we need to make an adjusting entry to update the *Allowance* to whatever it needs to be (even though we haven't made new credit sales). It's best to be careful with these problems, and draw out the T-accounts, to make sure we're not forgetting anything. Here is what the T-account for *A/R* and the *Allowance* would look like at the end of the reporting period ***before*** making the required adjusting entries:

Accounts Receivable (A)

Debits	Credits
11/10/'21: $2m	03/03/'22: $8m
12/10/'21: $8m	03/17/'22: $2m
Bal: $0	

Allowance (contra-A)

Debits	Credits
03/17/'22: $2m	12/31/'21: $1m
Bal: $1m	

Since the balance of *Accounts Receivable* is now 0 (all customers have either paid or been written off), the new balance of the *Allowance* must be zero as well. It currently has a debit balance of $1m, after the previous period's adjusting entry and this period's writeoff. So, for our adjusting entry, we need to get it to a balance of $0 *via* a $1m credit. And the matching debit is the *Bad Debt Expense*, by definition. So, coming to our conclusion, our adjusting entry would be...:

Bad Debt Expense (-S.E.):	$1m	
Allowance for Doubtful Accounts (+contra-A):		$1m

12/31/'22 Adjusting Entry to update the Allowance

8.6.4 Evaluating the B/S Method

In order to understand what happened here, and interpret this method, let's once again quantify the key measures related to uncollectible accounts in each period, under this method: the *Bad Debt Expense* (the 'flow' / Income Statement measure) and the *Net Accounts Receivable* (the 'stock' / Balance Sheet measure).

As a reminder, the scenario here was:

- **11/10/'21**: MattCo starts up & sells $2m of textbooks to **StudentCo** on account.
- **12/01/'21**: MattCo sells $8m to misc **other customers** on account.
- **03/03/'22**: MattCo's **other customers pay** their accounts in full—$8m.
- **03/17/'22**: **StudentCo** collapses and declares **bankruptcy**.

And, gathering from the above, the key measures under the **Allowance Method, assuming 10% of outstanding accounts are uncollectible,** would be:

	Bad Debt Expense	*Net Accounts Receivable*
FY 2021	\$1m	\$9m
FY 2022	\$1m	\$0m

So, what do we think? Does this method make sense?

The pros: There are some really cool, really good things about this method. First, this method definitely achieves **Goal #1** in FY2021: We account for *expected* credit losses on the credit sales we made. Second, in FY2022, this method achieves **Goal #2**—we make an adjustment for the fact that, contrary to our initial expectations, the **total uncollectible accounts** for the periods turned out to be **\$2m**. And, consistent with that, the ***total*** *Bad Debt Expense* over the two periods, combined, is **\$2m**.

This is, in my view, the coolest thing and deepest insight about the *Allowance Method*. Under the *Allowance Method*, the *Bad Debt Expense* **simultaneously** factors in both (i.) expected losses on new accounts, and (ii.) "surprise" writeoffs, contrary to our previous periods' expectations, on past credit sales. In FY 2021, the \$1m *Bad Debt Expense* is driven by the former. In FY 2022, it's driven by the latter.

That's the concept. But how precisely did that work out, in the accounting mechanics? Under the *Allowance Method*, "news" about actual realized collections, worms its way into the *Bad Debt Expense* indirectly. When we have a writeoff, that "uses up" the *Allowance* (reduces it with a debit). And, under the Allowance method, we need to get the balance of the Allowance to where it needs to be at the end of the period—and that number determines the *Bad Debt Expense*, by definition. That is, the greater our **write-offs** during the period, the greater the reductions in the *Allowance* during the period (per **Rule #2)**, the bigger the credit to the *Allowance* in the end.

The cons: But there's a dark side, too. As the table above noted, the *Bad Debt Expense* for FY 2022 was \$1m. This is despite the fact that the company did not make any credit sales—or, indeed, any *Revenues* at all—in this period. That \$1m *Bad Debt Expense* came from the "surprise" writeoffs during the period. Is that a good thing? Some people think it is, that it means that this method achieves **Goal #2**, above.

But I am not sure it is, for the following reason: That expense is not well "matched" to the related revenues—the expense is recorded in 2022, even though there are *no sales at all* in FY2022. So, that seems economically illogical. It also has practical implications: If each year's *Net Income* is being affected not just by that same year's sales, but also by the *"surprise" collections and writeoffs of past years' sales as well*, that can

make the bottom-line profit more **volatile and opaque—harder for us, as financial-statement users, to understand and forecast**.

Indeed, under the *Allowance* method, we can even have a ***negative*** *Bad Debt Expense*—that is, boosting *Net Income*—if the positive "surprise" collections on past periods' accounts outweigh the expected losses on new credit sales.

For example, consider the example scenario we we used above, but now suppose that, instead, StudentCo paid off all $2m of its account on 3/17/'22. Then, in that case, there would have been no $2m debit to the *Allowance* during the period, so its balance, prior to adjustment, would be a *credit* of $1m. But, since all accounts had been paid off, the ending balance of the *Allowance* would still need to be be $0. So, the required adjusting entry would be a *debit* of $1m to the *Allowance*, meaning a *credit* of $1m to the *Bad Debt Expense*—a negative expense.

This does not seem to make economic sense, but it can happen in companies' accounting, and has happened in reality, under the allowance method.

8.6.5 The general form of the Allowance

One way to see all of this more formally (and get some nice shortcut formulas for solving quantitative problems) is with the "general form" of the T-account for the *Allowance*, under that assumption that a percentage (p) of outstanding receivables (AR) will prove uncollectible.

Allowance T-account

Allowance for Doubtful Accounts (contra-A)	
$Writeoffs_t$	Beg. Bal: $(p * AR_{t-1})$
	12/31: $Bad\ Debt\ Expense_t$
	End. Bal.: $(p * (AR_t))$

This nicely summarizes what drives the *Bad Debt Expense* under the *Allowance Method* works. By definition, the 12/31 adjusting entry is what determines the *Bad Debt Expense*. And, as this T-account shows, that number, in turn, will be determined by three other factors:

1. The outstanding receivables at the end of this period, AR_t, and the percentage (p) that we expect not to collect.

2. Vs. the beginning balance of the allowance, which is last year's ending balance $(p * AR_{t-1})$.

(a) That is, the *change* in outstanding accounts receivable, from last period.

3. The writeoffs during the period, which "use up / reduce the *Allowance*, and therefore influence the required adjusting entry. The higher those quantities, the higher the required adjusting entry on 12/31, the higher the *Bad Debt Expense*.[4]

Equations

Or, generalizing a bit further, we can express the same idea in algebraic form. First, note from the T-account above that the beginning balance of the Allowance ($p * AR_{t-1}$) minus the $Writeoffs_t$ plus the $(Bad\ Debt\ Expense_t)$ equal the ending balance. Or, written algebraically:

$$p * AR_{t-1} - (Writeoffs_t) + (Bad\ Debt\ Expense_t) = p * AR_t \tag{8.2}$$

Next, isolating the *Bad Debt Expense* on the left side, we have:

$$Bad\ Debt\ Expense_t = p * AR_t - p * AR_{t-1} + Writeoffs_t \tag{8.3}$$

Next, we can rewrite that in terms of the *change* in outstanding *Accounts Receivable* between the two periods:

$$Bad\ Debt\ Expense_t = p * (\Delta AR) + Writeoffs_t \tag{8.4}$$

The formula above may be the simplest quantiative formula to memorize for solving quantitative problems. But we can build better *understanding* by further ***decomposing*** the change in *Accounts Receivable*, into the underlying events that drive it. A/R is a "stock" / Balance Sheet measure, and it *increases* with new credit sales, and decreases with collections and writeoffs (under the Allowance method). Therefore:

$$\Delta AR = Credit\ Sales_t - Collections_t - Writeoffs_t \tag{8.5}$$

So, with that decomposition, we can plug in for ΔAR and rewrite our previous formula like so:

$$Bad\ Debt\ Expense_t = p * (Credit\ Sales_t - Collections_t - Writeoffs_t) + Writeoffs_t \tag{8.6}$$

[4] To test your confidence and understanding of that T-account above, try the following **practice problem**: Our company accounts for bad debts / receivables using the **allowance method**, assuming 10% of outstanding accounts will be uncollectible. We began FY2020 with a balance of $50k in Accounts Receivable and $5k in our Allowance for Doubtful Accounts. During FY2020, we made an additional $30k in credit sales, collected $20k on accounts from past credit sales, and wrote off $3k in accounts. What would be our FY2020 Bad Debt Expense?

And, finally, gather terms and simplify **to this fully general formula**:

$$Bad\ Debt\ Expense_t = p * (Credit\ Sales_t - Collections_t) + (1-p)Writeoffs_t \quad (8.7)$$

That formula above (8.7), if you can memorize it, provides a very handy shortcut for solving quantitative problems (instead of making multiple T-accounts). And, it also beautifully **distills** how different events effect the *Bad Debt Expense* under the allowance method. As the formula above shows, **all else equal**, the higher our new credit sales during the period, the higher our *Bad Debt Expense* will be. The higher our collections during the period, the *lower* it will be. And the greater our writeoffs during the period, the higher it will be. So, this equation shows how, under the Balance Sheet method, the *Bad Debt Expense* simultaneously factors in both (a.) the effect of new credit sales during this period and (b.) "news" about collections vs. writeoffs from past accounts.

8.7 Debating the methods: The Balance Sheet vs. Income Statement Approach

While the above were toy examples, they illustrate the general problems and tradeoffs, which are a source of real debate and consternation, even among non-accountants. Most companies use the *Balance Sheet* method, and it is common for Wall Street investors to complain about how "opaque" the *Bad Debt Expense* is as a result. This gets at a major theme in accounting, though a bit advanced: the tradeoff in **Income Statement vs. Balance Sheet principles and emphases**.

Broadly, under "balance sheet perspectives," we focus on measuring and reporting the net assets of the firm "correctly" *per se*. But, as we know, via the core linkages and identities of accounting, changes in asset and liability accounts "flow through" to revenues and expenses, and *vice versa*. (This is especially palpable in the Allowance method—the *Bad Debt Expense* **is**, by definition, the **revision in the Allowance**.) However, given those linkages, if we prioritize measuring assets and liabilities "correctly" each period, then the *revisions* in estimates of those assets and liabilities will *flow through* to revenues and expenses, and impact *Net Income*, even when they do **not** have to do with any changes in the company's real **operations and activities during that period.**

This is a general tradeoff in accounting, and it shows up in a lot of places, not just the methods for accounting for *Uncollectible Accounts*. (Indeed, the real reason I give such a thorough discussion of these methods is that they serve, in my course, as a *synechdoche* for this broader, more general tradeoff and debate.)

If we prioritize measuring the net assets that companies acquired in previous peri-

ods "correctly," then we will likely make *Net Income* less *persistent and predictable* (due to the downstream effects of those asset and liability re-valuations) and less informative about the company's current and recurring operations and activities.

But, if we eschew such revisions, in order to keep Net Income smoother and better "matched" to the same period's activities, then our net assets on the Balance Sheet will become misstated over time. It's an inevitable tradeoff, at least as far as I can tell. **We can't have it all.** The universe is tragic. (Insert doomer meme here.)

I lean toward income-statement perspectives. In my view, it's not a big problem if *Net Accounts Receivable* gets a bit misstated over time, because, who really cares about the Balance Sheet "stock" accounts? What matters, in my view, is having a rational, predictable, understandable measure of the profitability of the company's current and ongoing activities. And I think the *percentage-of-credit sales method* does better on that. But, most major U.S. corporations use the *Allowance Method*, so, evidently, most accounting demigods disagree with me. And I've changed my mind on this question each time I've taught it. I'm excited to see if students can change my mind again.

To understand my position, and the argument in favor of the income-statement method, consider a somewhat more realistic scenario (as opposed to the toy example above, with only two periods, one in which all the credit sales were made). Instead, consider this new scenario, in which a company keeps making new credit sales and new collections each period, and its estimates are off by small amounts each time.

8.7.1 A more realistic scenario

Assumption: MarshallCo uses the percentage-of-credit sales method, and assumes 10% of new credit sales each period will be uncollectible.

- **2019**: MarshallCo starts up its life and sells $1m on account.
- **2020**: MarshallCo (i.) collects all $1m from 2019, and (ii.) makes an additional $1m in new credit sales
- **2021**: MarshallCo (i.) collects $800k from 2020, while the customers with the other $200k in accounts go bankrupt, (ii.) makes $1m in new credit sales.

Distilling and summarizing verbally: In each period, MarshallCo makes $1m in new credit sales and assumes 10% will be uncollectible. And in 2020 it collects a bit more than expected on the previous period's credit sales, while in 2021 it ends up collecting a bit less than expected.

The rule under the percentage-of-credit sales method is that we just record *Bad Debt Expense* and add to the *Allowance* based only on "flow" of new credit sales each period. Therefore, quantifying the key measures, under this method.

	Bad Debt Expense	*Net Accounts Receivable*
FY 2019	\$100k	\$900k
FY 2020	\$100k	\$800k
FY 2021	\$100k	\$900k

This, more realistic, example illustrates the argument in favor of the income statement method. Reality will always play out a bit differently than we expect. But, if we're forming our expectations well, things will probably roughly even out over time—sometimes we'll collect a bit more than expected, and sometimes a bit less.

Arguably, using this income-statement method, our *Net Accounts Receivable* is a bit misstated in 2020. As of the end of 2020, we had collected all \$1m in accounts from sales made in 2019, and just made another \$1m in credit sales in 2020—so, arguably, *NAR* should really be \$900k. Instead, applying the rules of the *percentage-of-credit-sales* method mechanically, the number is \$800k (since total A/R will be \$1m and the total *Allowance* will be \$200k). But I argue that that's not a big deal, since (1.) who cares about the Balance Sheet measures? and (2.) it will "wash out" over time.

And, on the positive side, we now have a measure of the *Bad Debt Expense* that is more *understandable, predictable,* and driven by *this period's activities.* In my view, having an *income statement*—and, thus, measure of *profitability*—with these desirable properties is worth the cost of slightly "misstating" the value of our Balance Sheet accounts from time to time. But, there is an inevitable tradeoff, and most companies and accounting professionals evidently prefer the Balance Sheet method.

8.8 Methods for estimating the allowance

In the example above, I was focusing on the big new ideas: The nature and interpretation of the three methods, the tradeoffs, the intuition for how "expectations" and "news" about bad debts get factored in, etc. So, therefore, when covering the *Allowance Method*, I made a very **simple assumption**, that the company always assumed that it would fail to collect a certain **fixed percentage of all outstanding accounts**. This is the simplest possible method for estimating the *Allowance,* which we can now call the "percentage-of-receivables method" (for self-explanatory reasons).

But in reality, this is only **one possible method of estimating the Allowance**, and a fairly **crude** one at that. In principle, companies could use big data, machine learning, fancy statistical methods, and **all of the information they have about their customers** to get a better estimate of the *Allowance.* After all, under the Balance Sheet method, the goal is just to get a good estimate of *Net Accounts Receivable*—the Accounts Receivable we will actually collect. So, the question here is really just **a general**

forecasting problem, and, in principle, there's nothing stopping us from bringing all the information and statistical tools we have to that problem.

However, since this is not a statistics or data science course, we compromise, and just cover **one particular conventional method** that factors in just ***a bit*** **more information** to get a more precise estimate of the *Allowance*: The Aging of Receivables Method. Note that this method is like a sub-category of the *Allowance Method*, not some alternative. The *Allowance Method* means that we focus our attention on updating the *Allowance* at the end of the period, based on the outstanding accounts (rather than simply accruing a *Bad Debt Expense* based on credit sales in that period). We previously covered one way **to do that**: The percentage-of-receivables method. Now, we'll cover another approach for estimating the allowance: The aging of receivables.

8.8.1 Aging of Receivables

The conventional alternative method that we'll cover is the **Aging of Receivables Method**. All this really means is that, instead of crudely applying a constant percentage to all of its receivables, the company **uses information about how long each account has been past due, to estimate** what portion will be collected. Generally, the assumption is that the **longer an account has been outstanding, the lower the probability** that it will in fact be **collected**.

So, concretely, we would put different outstanding accounts into different "buckets," depending on how long they have been outstanding. And, for each bucket, we would estimate what portion of those accounts in that age range will prove uncollectible. And so our estimate of the total accounts uncollectible will just be the **"dot product"** of the two: The amount of each bucket, multiplied by its estimated percent uncollectible, all added together. Implementing this is just a matter arithmetic. It requires no genius, just a little care and diligence.

For example, suppose that our company, based on our historical experience and data, estimates that 10% of accounts that have been outstanding less than 60 days will be uncollectible; and 30% of accounts outstanding longer than that will be uncollectible. These are the only two "buckets" we use. Suppose we currently have \$2m in accounts outstanding less than 60 days, and \$1m in accounts outstanding more than that. Then, this implies that our updated *Allowance for Doubtful Accounts* should be: $(\$2m * .1) + (\$1m * .3) = \$500k$. That's all! The more buckets we use, the more arithmetic terms we will have. But the concept will always be that simple.

We can also organize this in a a matrix or table structure, like the below:

	Bucket #1: Accounts $<$ 60 days	**Bucket #2: Accounts $\geq$ 60 days**
Outstanding Amount	\$2m	\$1m
% Uncollectible Assumption	10%	30%
Est. Amount Uncollectible (\$)	\$200k	\$300k

Total Est. Amount Uncollectible (\$): \$500k

Matrix for visualizing/calculating *Allowance* based on *age* of accounts

Once we have that number—our updated estimate of how much will prove uncollectible, and, hence, the updated balance of the *Allowance for Doubtful Accounts*—we're back on familiar terrain. Always and everywhere, using the allowance method, at the end of the period, we update the *Allowance* by whatever amount is required to get it to its new balance, and the balancing debit is the *Bad Debt Expense*. All that we have added here is a different method for getting that balance of the *Allowance*. Everything else remains unchanged.

Practice problem: Our company uses the Allowance method, and estimates the Allowance using the *aging-of-receivables* method. We began FY2022 with a balance in the *Allowance* of \$20k. Over the period, we wrote off accounts totaling \$10k, and make additional credit sales as well. We end FY2022 with \$100k in Accounts outstanding less than 30 days, and \$80k in Accounts outstanding more than 30 days. We assume 10% of the former category and 15% of the latter category will be uncollectible. What will be our *Net Accounts Receivable* and *Bad Debt Expense* for FY2022?

Solution: First, *Net Accounts Receivable* is trivial: We are given that we expect 10% of \$100k in accounts and 15% of \$80k in accounts to be uncollectible, or \$22k uncollectible out of \$180k total. Therefore, *NAR* is \$158k.

Solving for the *Bad Debt Expense* under the Balance Sheet method is always harder, and I recommend writing out the T-accounts. Here is a compressed verbal summary of how to do that: We start out the period with an Allowance of \$20k (a credit balance in that T-account). During the period, we have writeoffs of \$10k—writeoffs 'use up' / reduce the allowance in the B/S method. So, before adjustment, the Allowance will have a balance of \$10k (i.e., \$20k - \$10k). We assume 10% of \$100k and 15% of \$80k will prove uncollectible. So, the ending balance of the Allowance must be \$22k (i.e., .1*100k + .15*80k). So, the adjusting entry must get our Allowance from \$10k to \$22k. That means the Bad Debt Expense will be \$12k.

9

Receivables Part 2: The Remainder

In Part 1 on *Receivables*, we covered the biggest, most challenging, most novel idea: accounting for **uncollectible Accounts Receivable**. But, our company might have other kinds of **receivables**—most significantly, *Notes Receivable*, when we make a loan to another company. We've talked about the case where our company receives a loan (which is a *Note Payable* for us), but not this. And, there are a few steps in the life of a loan that we haven't accounted for so far. We'll learn how to account for it all.

There are some more interesting, conceptual issues we'll cover as well. We've talked about the fact that companies and customers can't always pay their debts, and mentioned 'bankruptcy' in a couple of different contexts—as a dreaded outcome for our company if we can't pay, or a potential reason why our customers might not pay. But we haven't explained *exactly* what bankruptcy is, and what happens. Finally, we'll cover two different ways in which companies can put interest-like terms into their contracts with customers who pay on account, though with different accounting treatments. These examples will show that, sometimes, the distinction between 'operating' vs. 'financing' can be a bit 'fuzzy'—the two can be tangled up in interesting ways.

9.1 Notes Receivable vs. Accounts Receivable

9.1.1 What's the difference?

Both *Notes Receivable* and *Accounts Receivable* are, obviously, **receivables**—amounts we are entitled to receive from others, and thus assets. To date, we've drawn a simple, clean line, and always said that an **Account** is an amount owed from a **customer** from a credit sale, while a **Note** is a purely financial instrument, a **loan**. But in reality, the categories can blend together a little bit. Sometimes, our company might require our **customer** to **sign a more formal contract** for a **credit sale**, with specified **interest terms**. In this case, it might be categorized as a **Note Receivable**.

Why would our company do one vs. the other? Very often, if we are selling to a **regular customer** with **good credit** (that is, enough cash and cash flows to pay us back, and a track record of doing so), we could be easily satisfied with a **more informal understanding**—we ship the goods and invoice, and trust that they will pay us later, in order to continue our business relationship. That would be an **'Account.'**

But, in other circumstances, we might be worried about the **ability or intention** of our customer to **actually pay**. So, in that case, we might demand a more **formal contract**, including **specified terms of interest** designed to **incentivize** early payment, and **compensate** us for risks and delays in payment. In that case, it would be a '**Note**.'

Since **Notes** are more formal, they would also have greater **legal priority**, or 'teeth.' So, if the customer **declares bankruptcy**, and goes to bankruptcy court, holders of formal written 'Notes' would be more likely to get paid sooner and in full than the suppliers who had unwritten/informal understandings recognized as 'Accounts.' We use the term **"seniority"** to indicate the relative **priority** of various creditors' claims in bankruptcy court. A formal **"Note"** will have higher seniority than an informal **"Account"** and thus be more likely to get paid in full, in the event that the customer ends up in bankruptcy court.

9.1.2 What exactly is bankruptcy?

We've referenced "bankruptcy" a number of times in this course. And it is a key business concept. But most people outside of the corporate law, finance, and accounting worlds don't understand what it *really* means. In everyday speech, when people use the term 'bankruptcy,' they seem to think it means **corporate death**. But that's a very **inapt and misleading metaphor**, which causes a lot of the confusion.

In reality, in the United States, bankruptcy is mostly a **technical legal proceeding** for determining **which creditors** get paid **how much** when a company is unable to meet *all* of its legal obligations. Contrary to popular belief, **companies continue operating** while they are in bankruptcy court—they continue to sell their goods and

services, run their factories, employ their employees, etc. American Airlines was in bankruptcy court between 2011 and 2014; and if you flew American in those years, you probably didn't know it.

Go back to our Chapter 1 foundations, on the nature of *credit vs. equity* financing. We said that companies **"have to" pay their debts.** But what if they *just can't*, because they simply don't have the cash on hand or incoming cash flows (liquidity) to do so? If they just can't, then they just can't! If they *don't*, then the company is said to be **"in default"** (or "to have defaulted on its loans"), and the company's creditors have various forms of **recourse** specified in their **debt contracts**, including, for example, **seizing collateral** (see, e.g., "Airplane repo" on YouTube). But that **collateral** is the assets—the resources—that companies use to run their operations. So, when creditors seize collateral, that significantly **disrupts** their operations, which, in turn, disrupts their ability to generate revenues and cash flow going forward. That, in turn, could just make things **worse** for all of the **other creditors.**

As a result, U.S. corporate law has evolved a rich, sophisticated, and valuable body of **bankruptcy law**. When companies see that they will be unable to pay their debts, they **"file for bankruptcy protection."** Under bankruptcy **protection**, creditors are **prevented** from **seizing collateral**. That way, the bankrupt company can **continue operating**. However, in exchange, the company has to go to **bankruptcy court**, with its creditors as the other parties to the case. And they litigate and negotiate, and the court eventually determines **who gets paid what, and how**.

There are a couple different forms of bankruptcy, but, most significantly, under **Chapter 11** bankruptcies, the parties will negotiate **"The Plan"**[1] for **reorganization**—that is, how the company will change its policies and strategies in order to pay back its creditors as much as feasible.

So, the **truth** about bankruptcy is very different from the **popular layperson impression**. Why do so many people have the wrong idea? You may recall that during the early phases of the coronavirus pandemic of 2020, as **airline travel** was decimated, many **airlines** risked defaulting on their obligations, and there was a high-profile public debate over potential government **"bailouts"** for the airlines intended to help them avoid bankruptcy.[2] Many **proponents for** these "bailouts," especially those within the airline industry itself, argued that they provide essential services (transportation) and employ many people and that, therefore, the U.S. government should step in and provide cash or financing to help "save" them from bankruptcy court.

[1] This is, in fact, the formal legal term.

[2] Go back to Chapter 1 foundations, on the question of 'paid-in capital' and 'earned capital.' Companies need cash inflows to pay the cash outflows they have to pay (e.g., salaries for specified employment contracts). They can get that cash by raising financing ('paid-in capital'). But, once companies are up and running, they hope to get that cash from running their business, making sales to paying customers ('earned capital'). So, if those sales disappear, that source of 'earned capital disappears, too. So, how does a company in this situation survive?

What's the problem with this argument? It's a **non sequitur**. As we just learned, companies can continue to operate and employ people and pay salaries during bankruptcy. Nothing about bankruptcy *per se* changes that. The claim that the airlines needed to be "saved" from bankruptcy court in order to continue providing their essential services is clearly fallacious as stated.

So why did so many people within the industry and government make this argument? Ask this question instead: **Who really loses during bankruptcy?** Go back to Chapter 1 foundations. **Equity investors** are the **'residual claimants.'** They get paid 'what's left over,' after everyone else. So, in a classic bankruptcy, the **current shareholders** get 'wiped out.' That is, the **financial owners** of the corporation lose wealth. And, these days, the executives of major U.S. corporations have lots of stock-based compensation, and thus equity ownership in their corporations.[3] So they, and the other large shareholders, are the ones who really lose.

So, why do so many people **believe** that bankruptcy is corporate 'death,' and that companies must be 'bailed out' in order for their goods and services to continue to be provided? One partial explanation could be that people with large ownership stakes in those companies—such as their executives—*want us to believe that*, because it will help them negotiate for bailouts. They are the ones who are sure to lose in bankruptcy.

We **can't blame them** for wishing to avoid that. (Don't hate the player, hate the game.) But we **shouldn't be deceived**.[4]

9.1.3 Accounting for Notes Receivable: Interest and Principal

To date, we have only shown how to account for *Notes Payable*, when our company receives a loan from somebody else. And, even then, we didn't show the *final step*—paying off the loan. Let's now cover *Notes Receivable*, when we make a loan to another company, including the date on which the loan is paid off.

Example: Suppose that our company does annual, calendar-year reporting. On July 1, 2022 (exactly **halfway through the year**), we make a $10,000 loan, with a 5% stated interest rate (paid annually), and a one-year **maturity** (jargon).

That means that the $10,000 "face value" of the loan will be paid off and the loan will be discharged in full in exactly one year. And, since the interest rate is 5%, paid annually, we will also be paid the $500 interest payment on that date as well. Since this loan is so simple, with only one payment date, we need to account for just three dates:

- (1.) the day we make the loan,

[3] And, for the most part, this is usually a good thing—a key "governance mechanism" for 'automatically' aligning CEOs' incentives with the interest of the owners.

[4] See "Economics, Law and Finance Professors from Major Universities Write to Congress: 'Bail Out People Before Large Corporations,' March 24, 2020" for further discussion.

- (2.) the Dec. 31 adjusting entry for accrued interest, before closing the books,
- (3.) the date on which the loan is paid off in full.

Those journal entries would be as follows:

Note receivable (+A):	$10,000	
Cash (-A):		$10,000

Jul. 1, 2022: We make the initial $10,000 loan

Interest Receivable (+A):	$250	
Interest Revenue (+S.E.):		$250

Dec. 31, 2022: adjusting entry for **half year of *accrued* interest**

Cash (+A):	$10,500	
Note Receivable (-A):		$10,000
Interest Revenue (+S.E.):		$250
Interest Receivable (-A):		$250

Jul. 1, 2023: Paying off interest and principal

The final transaction is the only really new one. And it's our **first four-part journal entry**. So it looks big. But it's simple when we break it down.

Here is how I think of it: **Start with Cash**. We receive the principal ($10k) and the interest ($500) on that date, and they are both just cash, so we **debit the sum** in one line. What else? Now that the borrower has paid off their loan in full, they no longer have an obligation to us, so we no longer have a receivable from them. So we need to **extinguish** *both* the initial *Note Receivable (A, $10k)* as well as the *Interest Receivable (A, $250)* we accrued in the previous journal entry. Those are reductions in assets, so both credits. Finally, in the **half year since the last journal entry**, we have **accrued**/earned another $250 in interest. So, we credit another $250 to **Interest Revenue**.

The one that sometimes trips students up is the the $250 credit (reduction) to the **Interest Receivable**. Here's what can be counterintuitive about it: Over the half year since the last journal entry, some students think that, *conceptually*, an extra $250 of interest *had* accrued. So some students are tempted to think there should be an increase (a debit) in the asset reflecting that entitlement (the interest receivable).

But that's **overthinking it:** For the purposes of accounting on the **payment date**, we just need to **update our accounts** to what they need to be after that transaction. And that extra 'conceptual' receivable, that was theoretically accruing over that time, had never *accrued on the company's accounts*. After the interest payment, the borrower has fully discharged their obligations, paying down both the principal and interest in full. So, we need to extinguish the receivable *on our books*, to get the remaining **receivable balance to $0**. And the only **accounting entry** that had been made to it was the $250 debit as of the last adjusting entry. So, we just need to credit that account for $250, and that's the end of the story.[5]

9.2 'Sales discounts': Incentives for quick payment

The last concrete thing to cover is "Sales discounts."[6] A Sales Discount is when a company **sells to a customer on credit**, sends an invoice with a **stated price**, but offers a **discount for "early" payment**. (You'll see why I put "early" in scare quotes, by the end.) Companies do this to **incentivize earlier**, more secure **payment** of their accounts. I'll show how this is accounted for, and then raise some discussion topics.

Suppose our company sells to a customer "for" $10,500, but states that if the customer pays **before** a certain date (say, December 1, 2021), the customer will get a **Sales Discount** of $500 off. Then, on the date of the initial sale, the company would account for it as usual, recognizing revenue for the full list amount ($10.5k).

Accounts Receivable (+A):	$10,500	
Revenue (+S.E.):		$10,500

Initial Credit Sale of a Service, October 1, 2021

And, *if* the customer paid *after* December 1, and thus had to pay $10.5k, we would *also* account for it as usual—debiting cash and crediting A/R for that full amount.

But what if the customer pays early, say, on November 20th, and is thus able to claim the Sales Discount? **Start with the Cash (debit)**. Per the stated terms of the contract,

[5] This is a case where also drawing out all the T-accounts can be useful and clarifying. Additionally, another way to *think about* this is that since we are only making one journal entry for everything that happened after January 1st, a $250 interest receivable theoretically accrued in that time, but $500 in interest was paid on that date, so that "nets out" to a $250 reduction in the total interest receivable on that date. Or, you could imagine, as a thought experiment, what the accounting would look like if we *accrued* the extra Revenue and Receivable as a separate journal entry on June 29th, and then paid everything off on June 30th.

[6] (Note that these are different from **Trade Discounts,** which are just 'discounts' from the quoted/stated 'list price,' and, so, have no significance in accounting. We already know from our lectures that 'the list price is just marketing material, the transaction price is what matters'—so there is no real accounting for 'trade discounts.' We just use the actual purchase price as usual.)

that customer will only actually pay $10,000. And the customer's **Accounts Receivable** will be fully **extinguished**—a credit. But that *Account* was recorded, above, at the full $10,500. How do we **plug the difference**?

The answer is we use an account called **Sales Discounts (contra-Rev)**. This is another **contra-Account**, specifically our first **contra-Revenue**.

Cash (+A):	$10,000	
Sales discount (contra-Rev):	$500	
Accounts receivable (-A):		$10,500

Customer pays early, Nov. 20, 2021, claiming discount

You can think of this account as just a 'plug' for this transaction. But it also should make intuitive sense to think of it as a contra-Revenue. Given the **core principle** that **accruals and cash flows must be 'reconciled' over the long run**, and given that the customer is only paying $10,000, the Revenue recognized should be reduced to that amount.[7]

Now, one last bit of **jargon**: Within the context of a company's own **internal accounting**, we use the term **'Net Sales'** to mean the total Revenues **net of** contra-Revenue accounts. It's like the 'book value' of Equipment in that respect. (And **'net'** often has this meaning in accounting.) The **Revenue** that companies report on the top line of their income-statement *is* this netted number. That is, we do not report contra-Revenues as separate lines on the Income Statement.

9.3 Customer Financing: Discounts vs. Notes

In accounting, as in life, we need to **draw lines** and make distinctions. But the underlying **reality** of the world is always a bit **fuzzier**. One thing that this chapter brings home is how our 'financing' and 'operating' categories can blend together quite a bit. Allowing your customers to buy 'on account' is like extending credit financing *to* them. Take a closer look at the last two transactions we considered, the *Notes Receivable* transaction and the *Sales Discount* transaction.

- In the **Notes Receivable** transaction, our customer paid $10,500 in cash (interest plus principal) **later** instead of paying $10,000 in cash **sooner**.

[7] There are also a variety of other **contra-Revenue** accounts used to account for things like customer returns. Because learning those would be somewhat rote, and not add much conceptually, I do not cover them in this text or my course.

- In the **Sales Discount** transaction, our customer paid $10,000 in cash (list price minus Sales Discount) **sooner**, rather than pay $10,500 in cash (list price) **later**.

Summarizing visually, the **Notes Receivable** contract looks like this:

Condition/timing:	pay earlier	pay later
Jargon:	list price	charged 'interest'
Cash payment:	$10,000	$10,500

Credit Sale Financed with Note Receivable

And the **Sales Discount** contract looks like this::

Condition/timing:	pay earlier	pay later
Jargon:	'sales discount'	list price
Cash payment:	$10,000	$10,500

Credit Sale with Sales Discount

As should be apparent, the actual underlying **cash flows** and **timing** are **identical** across these two examples. The **jargon** we use is **different**, and **so is the accounting**. Admittedly, this pair of examples is a bit stylized. But here are a couple of challenging questions to chew on, for those who like to go deeper:

1. First, what exactly is the difference between offering a **'discount'** to customers who pay **earlier** rather than later, as opposed to imposing **interest** terms on those who pay **later** rather than earlier?

2. Second, could managers use this to 'game' their accounting at all? Suppose that we want to report higher revenues in 2021, and it's now December. Instead of selling on account with interest, and reporting $10k in revenue from the sale, could we instead sell with a list price of $12k, and offer our customers a $2k 'discount' if they pay before June—thereby allowing us to report 20% higher revenues as of the end of the period (Dec. 31)? Would our auditors stop us from doing that?

3. Third, this issue raises a philosophical question: What do we **mean** by a **'transaction price'** when that **price is in fact conditional upon the timing of the payment**?

4. Fourth, and most generally of all, this suggests that, perhaps, for complex modern businesses, with rich and complex contracts, we really *cannot* always perfectly cleanly separate 'operating' vs. 'financing' activities and cash flows.

10

Inventory and COGS

Most companies sell **physical goods—products**. But, to date in this class, we have always used examples of service companies selling **services**. Why did we do that? The reason is that when companies sell a physical good, there are extra steps involved in accounting for the sale. When we sell services, the accounting was simple, involving a credit to Revenue and one balancing debit. But when companies sell **physical goods**, they also account for the costs attributed to the goods they just sold as an expense. This chapter is mostly about how to do that.

When a company first acquires and/or produces physical goods that it intends to eventually sell, we account for that as an **asset** called **Inventory**. We've talked about the "general form of an asset." When we purchase a resource that we expect to use over multiple periods, we initially write that asset up at the **purchase price**, and then expense it out over time, over the period of its use. For each asset so far, the only other questions have been:

- What do we *call* the associated expense?
- How do we measure the 'amount used up'?

For *Inventory (A)*, the associated expense that is recognized as it is 'reduced' or 'used up' is called **Cost Of Goods Sold**. And the general pattern for assets we've seen so far *largely* applies, but with a couple of major caveats. For example, **manufacturing companies** produce their own products—that is, make their own **Inventory**. So, for

these companies, the Inventory does not have a **purchase price**. Instead, these manufacturing companies have a complex process for estimating and **allocating** all the **costs of production** *to* their products in **Inventory**. These techniques are complex, and are covered in intermediate-level financial and managerial accounting courses. In this introductory-level course, we will consider only **merchandising companies** (such as retailers you are familiar with), which **buy finished products** from manufacturers, for resale to customers. As ever, for these companies, we write the **Inventory (A)** up at the **purchase price**.

So, for our concrete purposes, there are really only **two** major deviations from the general pattern of assets we've seen to date:

- First, under the **Perpetual Inventory System**, we recognize the expense from using up **Inventory** (that is, COGS), **on the date of the sale transaction, as an external transaction**, rather than as an adjusting entry at the end of the period.[1]

- Second, companies have a larger number of allowable **methods** for calculating the amount of Inventory **"used up"** (that is, the regular COGS expense). And these different methods, in turn, have different implications for the bottom-line net income a company will report, and the value of the *Inventory* on its books.[2]

I'll discuss these in order now.

10.1 Perpetual Inventory System

To date, we've had one "general form of an asset." When we first purchase an asset, we record the full **purchase price** to the **Asset** account. Then, over time, as we **use the resource up**, we account for the **amount used up** as an expense, via an *adjusting entry* at the end of the reporting period. We record the *related Expense* and reduce the balance of the **Asset** by the same amount. (In the case of *Equipment*, we did this *indirectly* via the *Accumulated Depreciation* contra-Account.)

However, in accounting for **Inventory (A)** and **COGS (the related expense)** under the **Perpetual Inventory System**, things are a bit different. We still write the Inventory *up* at the purchase price, on the date of its purchase:

[1] Technically, this is specifically true of companies using the **perpetual inventory system**, as opposed to a **periodic inventory system**—in the latter, **Inventory** accounts are updated only at the end of the period, as was the pattern with previous assets. But, given that nearly all modern retailers use the **perpetual system**, and this is what is interesting and novel in this chapter, it is the default for my course. Unless otherwise specified, in my course, a **perpetual inventory system** is assumed.

[2] (Note that these methods for estimating the amount of Inventory used up—the expense—do not affect or influence the initial **debits** to **Inventory** from purchases. Inventory **purchases** are always and everywhere written up at the **purchase price**.)

Inventory (+A)	$(Purchase Price)	
Cash (-A)		$(Purchase Price)

Purchase of Inventory, date during reporting period

However, under the **Perpetual Inventory System**, we do not wait for the end of the reporting period. Instead, we recognize the **COGS** expense, and reduce the **Inventory** balance accordingly, **on the date of the sale**, as an **external transaction**. That is, we expense the Inventory out on the **date it leaves our store**.

To make things a bit more palpable, suppose that our company is a **Liquid Yeet** retailer. On May 13, 2021, we sell 10 liters of **Liquid Yeet** to students for a **sale price** of $300 in cash. And suppose, for the sake of the example, that we estimate the **cost** of those 10 liters of our **Inventory**, which have now departed our store, was $100. (We'll talk about where that estimate could come from, next.) Then, on the date of the transaction, we would account for **both parts**:

Cash (+A):	$300	
Revenue (+S.E.)		$300
Cost of Goods Sold (-S.E.):	$100	
Inventory (-A):		$100

Sell Liquid Yeet from inventory for $300, 5/13/2021

While this still fits the general theory of assets, and is a small change, there are some cool things about this. First, a bit of **jargon**: We use the term '**gross profit**' to mean **Revenue minus Cost of Goods Sold**. I.e., it is your 'profit' after subtracting only your most "basic," "direct" product costs (without subtracting expenses from things like "overhead," rent, etc.). We have to wait until the **end of the reporting period** to see our **bottom-line profit, Net Income** because it is affected by all of the expenses that are recognized as *adjusting entries*.

But now, because all of the most 'direct' **product costs** are allocated to the **Inventory** asset, and we expense that out on the date of the sale, a store owner or manager can **visualize the gross profit on a particular sale**. That is novel, and valuable for many entrepreneurs, who wouldn't want to wait until the end of the year to know if they are generating any value.

Second, that four-part journal entry vividly illustrates how "value-generation" works in accrual accounting, in one single step. Note that, **total debits and credits balance**, as they must. However, the **Asset gained** (Cash (+A), $300) surpasses the **Asset ex-**

pended (Inventory (-A), $100); just as the **Revenue** (+$300) surpasses the **COGS expense** (-$100). In other words, while **debits and credits balance**, the effects on the total Assets, Shareholders' Equity, and Net Income **do not** net out to **zero.** So, in one transaction, we can see the link between the Income Statement and the Balance Sheet, "value creation" in one step, but everything kept in balance.

10.2 Inventory Cost Methods: Calculating COGS

How do we calculate the **COGS expense**? Companies replenish their *Inventory* with fresh purchases on a regular basis. (Inventory is a short-term asset.) This means that different units in inventory will come from different purchase 'batches,' bought at different prices. Per **core accounting theory**, we should want to **allocate the cost of purchasing Inventory** as we use it up **over time** and **match** that expense to the revenues it helped to generate. And, given that different inventory units are purchased at different prices over time, there's **no one obviously-superior way to do this**. Companies have the choice of four major methods:

- Specific Identification,
- First-In First-Out (FIFO),
- Last-In Last-Out (LIFO), and
- Weighted-Average Cost.

I'll show how each of these methods work, and then back up to discuss. It will be easiest to understand these methods with a concrete but simple example.

Example Suppose that our company first **buys three batches of 100 units each** of *Inventory*, on January 1st, January 8th, and January 15th, each at different prices, tabulated below; and then it **sells 150 units** on January 22nd, and then **another 75 units on January 25th**.

	Batch 1	**Batch 2**	**Batch 3**
Date	January 1	January 8	January 15
Units purchased	100	100	100
Price per unit	$10	$20	$30
Total cost	**$1,000**	**$2,000**	**$3,000**

Inventory Purchases

	Sale 1	**Sale 2**
Date	January 22	January 25
Units sold	150	75
Sale price per unit	$40	$40
Total Revenue	**$6,000**	**$3,000**

Sales

No matter what Inventory cost method the company uses, as of January 15th, before the company makes any sales, the company's **Inventory account/balance** would simply be written up with the purchase prices, and look like the below:

Inventory	
Jan 1: $1,000	
Jan 8: $2,000	
Jan 15: $3,000	
$6,000	

The **costing methods** only determine what **quantity** will be recorded as a **COGS expense** (and Inventory credit) on January 22nd. The four methods are below:

10.2.1 Specific identification

As the name indicates, under this method, the company would **specifically identify** which exact units had been sold, and which batch each unit came from. In the modern era, this could be possible if the full physical flow of inventory goods was tracked with barcodes or RFID tags. Suppose we determine that, of the 150 units we sold on January 22nd, **80** came from the **first batch**, **60** came from the **second**, and **10** came from the **third**. Then the Cost of Goods Sold (and matching Inventory credit) for the January 22 sale would be:

$$COGS,\ Jan\ 22,\ Specific\ ID = (80 \times \$10 + 60 \times \$20 + 10 \times \$30) = \$2,300$$

And, therefore, the journal entry for the January 22 sale, including both components, would be:

Cash (+A):	$6,000	
Revenue (+S.E.)		$6,000
Cost of Goods Sold (-S.E.):	$2,300	
Inventory (-A):		$2,300

January 22

And, the balance of **Inventory after this sale** would be $3,700 (i.e., $6,000 - $2,300).

Inventory	
Jan 01: $1,000	Jan 22: $2,300
Jan 08: $2,000	
Jan 15: $3,000	
$3,700	

Then, suppose we are told that the 75 units we sold on January 25 all came from the third batch. Then, the Cost of Goods Sold (and matching Inventory credit) for that sale would be:

$$COGS,\ Jan\ 25,\ Specific\ ID = (75 \times \$30) = \$2,250$$

And, the balance of **Inventory after this sale** would be $1,450 (i.e., $3,700 - $2,250).

Inventory	
Jan 01: $1,000	Jan 22: $2,300
Jan 08: $2,000	Jan 25: $2,250
Jan 15: $3,000	
$1,450	

While specific identification may seem like the most natural, obviously 'correct' inventory costing method, in practice, **companies rarely use it**. Sometimes it may be too costly and complex to track inventory units individually. But there are also arguments to be made that other methods better capture the *economics* of the company. This is something that first-time learners find odd and counterintuitive, so I'll first show those other methods, and then back up and discuss.

10.2.2 First In, First Out (FIFO)

As the name indicates, under this inventory costing method, the company **recognizes expenses *as if*** the **first** item **added** to the company's inventory (and still remaining in its balance) was the first **one 'out'**—the first one to be **sold**. In the example above, the first batch was 100 shirts purchased at $100 each. But the company sells **150** shirts on January 22nd. So, under this method, we would calculate the cost as if it took **100 units from the first batch and 50 units from the second** batch. So:

$$COGS,\ Jan\ 22,\ FIFO = (100 \times \$100) + (50 \times \$20) = \mathbf{\$2{,}000}$$

And the balance of *Inventory* after the Jan 22 sale would be $4k (i.e., $6k - $2k).

Next up: the January 25 sale of 75 units. We're still using FIFO, but as of now, we've already "used up" or "expensed out" all 100 units from the first batch, and 50 of the units from the second batch. (I like to imagine a litle **'pac-man'** shuttling along, 'consuming' the batches in order.) So, we would "take" the remaining 50 units from the second batch, and move on to take 25 units from the third batch.

$$COGS,\ Jan\ 25,\ FIFO = (50 \times \$20) + (25 \times \$30) = \mathbf{\$1{,}750}$$

And the balance of *Inventory* after the Jan 25 sale would then be $2,250.

Inventory	
Jan 01: $1,000	Jan 22: $2,000
Jan 08: $2,000	Jan 25: $1,750
Jan 15: $3,000	
$2,250	

Another way to calculate that quantity would be to just to note that, under FIFO, as of January 25, we only have 75 units of inventory left over, which must all be in the **last** batch (since we expensed out the **first** ones first). So, that's: $75 \times \$30 = \$2,250$.

10.2.3 Last In, First Out (LIFO)

As the name indicates, this method is just the opposite. We calculate the inventory cost as if the **last** item that we **purchased** and added to Inventory is the **first** one **'out.'** So, since the company sold 150 units, and each batch it purchased has 100, it would 'take' 100 units from the last batch, and 50 units from the second batch. So:

$$COGS,\ Jan\ 22,\ LIFO = (100 \times \$30) + (50 \times \$20) = \mathbf{\$4{,}000}$$

And the balance of *Inventory* after the Jan 22 sale would be \$2k (i.e., \$6k - \$4k).

Next up: the January 25 sale of 75 units. We're still using LIFO, but as of now, we've already "used up" or "expensed out" all 100 units from the third batch, and 50 of the units from the second batch. So, we "take" the remaining 50 units from the second batch, and the final 25 units from the first batch.

$$COGS,\ Jan\ 25,\ LIFO = (50 \times \$20) + (25 \times \$10) = \mathbf{\$1{,}250}$$

And the balance of *Inventory* after the Jan 25 sale would be \$750 (i.e., \$2,000 - \$1,250). Another way to calculate this is just to note that, under LIFO, as of January 25, we only have 75 units of inventory left over, which must all be in the **first** batch (since we expensed out the **last** ones first). So, that's: $75 \times \$10 = \$750$.

10.2.4 Weighed-Average Cost

As the name indicates, in this method, we simply **pool all the units remaining** in the inventory account together and recognize COGS at their **average cost**, calculated as the **total Inventory balance divided by the number of units remaining**. In this example, the inventory account balance is \$6,000, and there are 300 units, indicating an average cost of \$20 per unit (i.e., \$6,000/300 units). 150 units are sold. So:

$$COGS,\ Jan\ 22,\ Weighted\ Average\ Cost = 150 \times \$20 = \mathbf{\$3{,}000}$$

And the balance of Inventory after the Jan 22 sale would be \$3k (i.e., \$6k - \$3k).

Next up: the January 25 sale of 75 units. As of right now, after that January 22nd sale, we have 150 units of inventory remaining on our books at a total Inventory cost of \$3,000.

Inventory	
Jan 01: \$1,000	Jan 22: \$3,000
Jan 08: \$2,000	
Jan 15: \$3,000	
\$3,000	

That means the average cost is still \$20 per unit, \$3,000/150 (but note that the average cost would have changed if we had had another purchase in the interim, at a different price). So, the COGS for the January 25 sale would be:

$$COGS,\ Jan\ 25,\ Weighted\ Average\ Cost = 75 \times \$20 = \mathbf{\$1{,}500}$$

And the balance of Inventory after the Jan 25 sale would be \$1,500.

Inventory	
Jan 01: $1,000	Jan 22: $3,000
Jan 08: $2,000	Jan 25: $1,500
Jan 15: $3,000	
$1,500	

In practice, the Weighted-Average Cost method is very rarely used.

10.2.5 Inventory Costing Method Problems with Timing Tricks

The example above was simple, designed to illustrate the idea. And, for the most part, problems involving inventory costing methods will be quite straightforward—a matter of checking your work and doing the arithmetic, **diligence, not genius**. But the problems can get slightly **more complex** when you have **intervening inventory purchases**. For these problems, you need to remember that you cannot **expense out items that have already been expensed out**. For example, suppose that, after the sale on January 22nd, the company purchased another batch of inventory, 100 units for $40 each. (Denote this as: **Batch 4—Jan. 23, 100 units, $40 each**.) And *then*, the company sold **another 150 units afterwards, on January 24**.

Under LIFO, to calculate the COGS on this January 24 sale, in this counterfactual scenario, the company would **start** with the **last purchases in**—the 100 units purchased on January 23rd in Batch 4. But, since there were only 100 units in that batch, it would need to find 50 more units to "expense." But **we had already** "used up" (expensed out) all of the units in Batch 3, and 50 of the units in Batch 2, on our **original January 22nd sale**. So, we would need to 'skip over' Batch 3, and 'expense out' the 50 remaining units in Batch 2.

Or, similarly, using the Average Cost Method, if **new inventory is purchased at a different price** than the previous average, we need to **recalculate the average cost** as the total remaining Inventory balance divided by the number of units remaining, in order to calculate COGS on the **next sale**. So, it can get be a bit more complex than the simple example I used above. But again, it requires just diligence, no genius.

10.2.6 Why do these problems?

Admittedly, you will never have to hand-calculate COGS expenses in your careers. So, why do we make you do these 'rote' arithmetic problems in a university course?

- First, doing these problems helps to **bring home** what an expense really is in **accrual accounting**. An expense is often an **allocation or apportioning** of a

past expenditure on an asset. By making you calculate expenses for the **same transaction**, using **different costing methods**, we bring this home.

- Second, it illustrates a core theme and takeaway, of how the 'bottom line' is not such an objective, unquestionable thing. It depends on your **method** for calculating certain expenses. And different companies might use different methods.

- Third, the harder problems force you to think carefully about the intimate relationship between **assets and their related expenses**. E.g., to get hard **LIFO**- and **Weighted Average Cost**-method problems right, you have to think carefully about which units are remaining in your Inventory balance, after past expenses, and how that affects the expense allocated to the next purchase, etc.

10.3 Comparing Inventory Costing Methods

10.3.1 Why not specific identification?

Probably the most frequent question that first-time learners ask when learning about inventory costing methods is why don't companies always just use specific identification? This seems like the most natural, obvious, correct, and direct way to recognize costs—to use the purchase cost of the actual unit that you literally sold.

There are a couple of answers to this question. An easy answer is that, in many businesses, it's costly and complex to track the actual flow of individual units of inventory. But, in the modern, digital era, there are plenty of firms that can track each individual unit with RFID codes (note that companies know when you do or do not open their promotional emails), but that still don't use specific identification for inventory accounting.

A **deeper answer** is that, **based on core accounting principles**, specific identification isn't necessarily a better way of **representing** the **economics** of the firm.

In general, the expenses associated with 'using up' assets are the way a company **allocates** the cost of its initial investment over time, **matched** to sales, to give a measure of whether the company is selling at above its costs on an ongoing basis. And, from that perspective, the dollar amounts that the company paid for individual inventory unit are **sunk costs**—those purchases are in the past. So, when the company sells a particular unit of inventory, it's not obviously important that we expense the exact cost of that *particular* unit, rather than an **identical unit from a different batch**. Consider the following **thought experiment**, which illustrates this more vividly.

Winter storm shovels: Suppose our company is a local **general store** in the Northeast, and it is late fall. We currently have 15 **shovels** on our shelves, all of which we

purchased from a single batch, for $10 each. Now, suddenly, a surprising **early winter storm** is approaching. We know that there will be **demand for shovels**, so we want to stock up. But, because of the surge in demand, and treacherous roads, our **supplier** now charges us **$20 each**. Even so, we buy another 15 at this price.

Now, **fast forward to the late-April thaw**. There are still four shovels left over on the shelves—two from each batch. A **customer** walks in, sees four identical shovels on the shelves, and picks one of them **at random** to purchase.

Discussion Question: Is it important in any way, economically, or for the **users** of our company's **Financial Statements**, that our COGS expense for that sale reflect the particular batch it happened to be purchased in ($10 or $20), depending upon that customer's random choice? That cost **variance**, from the past winter storm, is a **sunk cost**, a one-off event. Of course, we do need to allocate the **total expenditure** in some way, at some point, over time. But should this customer's random decision decide **exactly how or when**? This thought experiment shows that specific identification isn't really 'better,' if we're focused on the **big-picture goal of accounting**, measuring and communicating the financial performance and position of a company in a way that is **useful** to the **users** of the **Financial Statements**.

If that abstract argument doesn't persuade you, consider the empirical fact: The vast majority of companies use either FIFO or LIFO for inventory costing.

10.3.2 Comparing FIFO and LIFO

Companies need to consider a couple of different factors when they choose whether to use FIFO or LIFO for inventory costing—and, in turn, investors need to think about those same factors when interpreting those companies' financial statements. We can understand the tradeoffs here by just thinking carefully about the *meaning* of the terms.

- **LIFO pros and cons:** By definition, LIFO starts with recognizing/allocating costs from the later batches of inventory purchases.
  - **LIFO pros:** You could argue that LIFO is normatively better—gives you a better picture of the 'true' economics of the firm—since it uses the **most up-to-date measure of the costs of acquiring the company's Inventory**. If **net income** is supposed to be a measure of whether the company is **selling at above its ongoing cost of production**, the most recent inventory acquisition costs are the most relevant for that. For this reason, **LIFO** is sometimes characterized as the **"income-statement method**" in this context.
  - **LIFO cons:** One obvious problem with LIFO is that, because it starts with the latest inventory purchases, if the company maintains a positive inven-

tory balance, its earliest inventory purchases will remain on the books at their original, now-stale costs. The costs of those earliest purchases are never allocated to sales. So, in general, under LIFO, the Inventory *balance* reported on the Balance Sheet will be understated.

- **FIFO pros and cons:** By definition, FIFO starts with recognizing/allocating costs from the earlier batches of inventory purchases.
  - **FIFO pros**: So, you could then argue that FIFO is normatively better: It doesn't have the same problem LIFO does, of the earliest purchases remaining on the company's books un-allocated as costs. So the *Inventory* balance reported on the Balance Sheet will more closely approximate its current market value . For this reason, FIFO is sometimes called the **"balance-sheet method"** in this context.
  - **FIFO cons**: But, the tradeoff is just the flipside. As a result, the revenues from sales are not **matched** to the most up-to-date measure of its Inventory costs. So, FIFO arguably does a **worse job** providing timely information, via the income statement, about whether the company is selling at above its cost of production on an ongoing basis.

Empirically, the choice of method has **financial implications** for the company's **reported** bottom-line net income. Usually, **in most industries, costs tend to rise over time**. Most advanced economies experience **inflation** rather than deflation, which is, by definition, a rise in average prices. And since **LIFO** 'picks out' the **most recent** inventory purchases, while **FIFO** picks the **earliest** inventory purchases, this means that the **LIFO** method usually generates **higher COGS expense** recognition. By core accounting identities, that means that LIFO will also entail lower net income, and a lower Inventory (and net Asset and Shareholders' Equity) balance. And **just the opposite for FIFO**.[3] Given this, **why would companies ever choose to use the LIFO method**? Here, it's time to introduce a new accounting theme: **tax reporting vs. financial reporting**.

10.3.3 FIFO, LIFO, and Taxes

Background on *tax* reporting

Companies pay taxes on their *tax* profits—that is, their profits as calculated under **tax accounting** principles and regulations. In the U.S., these taxes are collected and monitored by the Internal Revenue Service (IRS) and owed to the government. As of December 2020, U.S. corporations pay a tax rate of 21% of their corporate tax profits. But,

[3] In the minority of times and industries in which inventory purchases prices are decreasing over time, the situation will be just the opposite.

the profits on which companies pay their taxes (their **'tax profits'**) are different from the **financial-accounting** net income (calculated under *GAAP* accounting principles) that we have been discussing to date.

Put differently, companies need to report their profit to the IRS, in order to calculate their tax obligation—but **tax reporting is a separate system**, with different rules and standards, than the financial reporting that is the subject of this course. This is the explanation behind news stories you often read about how some company (say, e.g., Amazon) earned $**(Large)** profits, but paid $**(Small)** taxes. Such companies *are* paying 21% of their U.S. reported *tax* profits. But that base is much smaller than their **GAAP** financial-accounting profits, which are the quoted $**(Large)** number.

Does this seem **illogical and unfair**? You could argue it either way. Accounting is about getting information to parties who need that **information**, to **use** it for various **different purposes**. **Financial accounting** is the accounting that is done primarily for companies' financial **investors**. And they may need information **different** from the information required by the **IRS.**

For example, **investors may want *timely* information** about companies' performance in order to make their investment decisions. And the FASB, in setting GAAP standards for financial reporting, may care about *timing issues*, because it wishes to prevent companies from deceiving investors about **growth**. Meanwhile, the **IRS** may care less about timeliness and timing issues (i.e., the exact period in which some amount is recognized as an expense)—it may just care that companies pay an appropriate share of profits to government over the **long run**.

So, there can be **logical reasons why the two systems might differ**. But, no doubt, political **lobbying and bureaucracy** also explain many of the idiosyncracies of tax vs. financial reporting standards.

Relevance of *tax* to FIFO/LIFO

So far, we've assumed that the methods that these two accounting systems, **financial vs. tax reporting**, use are **independent**—that a particular accounting choice that the company makes for financial accounting purposes has no effect on its tax profit. And that is still the **the general rule—the two systems are independent, by default**.

But *Inventory* accounting is a **special case**, the one exception to this rule in this course. Under the **"LIFO conformity rule,"** U.S. companies must use the **same inventory costing method** for their **tax** accounting as they do for their **financial** accounting. As above, since costs tend to rise over time, **LIFO** will usually be the method that will show higher COGS expenses and thus **lower profit**. Lower tax profit means **lower taxes owed**—a good thing for companies' owners.

Of course, under the conformity rule, by definition, that means they'll have to do

the same for their financial reporting, lowering **reported *Net Income* as well**. And, in turns out that nearly all companies **accept this tradeoff.** Companies **prioritize minimizing the "real" tax cash obligation over maximizing *reported*, accrual-basis *Net Income*.** The reason for this is that **investors and financial analysts are not stupid**. They can 'unravel' the effect of LIFO vs. FIFO reporting on *Net Income*. So, firms prioritize saving **real cash money.**

Summarizing the above, companies will generally want to use LIFO for tax reporting in order to minimize their tax costs, but the **LIFO conformity rule** will force them to do the same for their financial accounting. Most companies decide that the benefit of a lower 'real' tax burden is worth the downside of *reporting* lower *Net Income* in their financial accounting.

10.4 Inventory, COGS, and their relationship

We just learned a couple different allowable **methods** for estimating COGS. But the **core axioms of asset accounting** still apply to **Inventory** regardless. This means that there are a lot of things we can know, and trick-question problems we can solve, without knowing which **costing method** is being used—just knowing how assets work.

Recall that, with Inventory (like assets in general), we write it up at the purchase price, and *credit* it (reduce it) with each corresponding expense. Based off of what we've seen so far, these are the only things that affect the Inventory T-account.[4] So, the balance of the Inventory account will be the cumulation of purchases that have incremented it and the COGS expenses that have decremented it:

Inventory	
$(Purchase i.)	$(COGS from sale 1)
$(Purchase ii.)	$(COGS from sale 2)
$(Purchase iii.)	$(COGS from sale 3)
	$(COGS from sale 4)
	$(COGS from sale 5)
...	...
$Inventory Balance	

Or, put differently:

$$Inventory\ Balance = \sum \$(Inventory\ Purchases) - \sum \$(COGS)$$

[4]The rare exception to this is when Inventory is **impaired**, which we discuss at the end of this note. In general, impairments are rare events, and so if a problem does not specifically specify it, you can assume them away.

You can see that this is just a case of the general asset identities we discussed in Chapter 5:

$$Asset\ Ending\ Balance = Asset\ Beginning\ Balance + Purchases - Related\ Expense$$

$$Purchases = \Delta Asset\ Balance + Related\ Expense$$

So, we can often **calculate a COGS expense without knowing the specific method used,** just by understanding these relationships. For example, suppose we have a beginning balance of Inventory (x, e.g., \$100), and ending balance (y, e.g., \$120), and are told the COGS expense (z, e.g., \$40)—then we can infer how much Inventory the company must have purchased over that period (v). Specifically, it must be that $v = (y-x)+z = \$60$. More generally, **given any three of the four variables** we can **solve** for the fourth.

10.5 'Levels of profitability' / Multi-Step Income Statement

The income statement starts with top-line revenues, subtracts out all of the company's expenses, and gets us to the proverbial bottom-line net income. Now that we've talked about COGS, we've talked about most types of expenses that are in the income statement. A common practice in business and financial analysis is to analyze different 'levels' of profitability, as we go down the income statement, netting out various categories of expenses.

Based on what we've seen so far, a simple Income Statement could look like this:

Income Statement for the Fiscal Year Ending Dec. 31 2020

Total Revenues	\$120
Cost of Goods Sold	(\$40)
Salaries Expense	(\$20)
Rent Expense	(\$10)
Interest Expense	(\$10)
Tax Expense	(\$9)
Net Income	**\$31**

A 'multi-step income statement' is **not really a GAAP thing**, but is something that companies or investors might **add** to make it easier to understand and **analyze** a company. It starts with top-line revenue, then sequentially subtracts out various expenses, but **nets out those expenses at intermediate stages** (that is, before bottom-line net

income), to get several profitability-type measures. These measures allows us to better analyze the drivers of a company's profitability and its opportunities.

10.5.1 Gross Profit

After starting out with **top-line revenue**, if we **only subtract** out the first expense line item, **Cost of Goods Sold (COGS)**, the difference is called **Gross Profit**.

$$Gross\ profit = Revenues - COGS$$

One way to understand it is that gross profit is what the company's profit *would be* if its only expenses were its most 'basic' costs involved in the direct physical production or acquisition of its product (i.e., its *Inventory*). A company's **Cost of Goods Sold**—that is, the cost of its product Inventory—is often considered its most **'basic' or 'inflexible'** cost. Analysts, private equity investors, or consultants might believe that companies could **"cut out fat"** in terms of **other expenses**—e.g., the salaries of middle managers, or headquarters' rent, or advertising—but, COGS is harder to 'budge.' The **classic private-equity business model** is to try to identify companies with decent **Gross Profit** margins, but with plenty of "slack" in other expenses. Private-equity investors would buy control of these firms, and cut out those other costs, in an attempt to increase the total profitability of the company and thus the value of the equity. So, the **Gross Profit Margin** is an important input in **understanding companies, as well as shaping and transforming them.**

10.5.2 Operating Income (and EBIT)

The next 'level' of profitability in our textbook's framework is **"operating income."** Here, it's easier to start with the **idea**, and then talk about the **calculation**. As the name indicates, operating income seeks to measure the value the company is generating from its actual normal business **operations**. That is, it is supposed to be exclusive of **financing and investing factors**, such as interest expenses, 'gains,' and certain other unusual or one-time **'special items'** having to do with more advanced accounting issues. So, the best definition is, admittedly a bit circular:

$$Operating\ Income = Revenue - All\ Operating\ Expenses \tag{10.1}$$

In the context of what we've done so far in this class, we haven't seen any of these 'special items.' So, for our purposes, it's probably easiest to just **start at the bottom of the income statement**, and then **work our way up, adding back every expense that is *not* operational.** In the context of what we've done so far, that's a short list, of only two items, **Interest Expense** and **Tax Expense**. So, at this point in the course,

Operating Income is identical to another **very common measure**, **Earnings Before Interest and Taxes (EBIT)**. The name indicates that it is the profit *before* taking out expenses for interest and taxes—that is, *after* adding them back.

$$EBIT = Net\ Income + Interest\ Expense + Tax\ Expense \tag{10.2}$$

EBIT is commonly used by financial analysts, because it allows us to compare the performance of two firms that have different **capital structure (leverage ratios)**, in an "apples-to-apples" comparison. The firm with more debt-financing would have higher interest expenses, holding all else equal. Therefore, if we want to compare the *operational* performance of the two companies, we would want to adjust for that by 'excluding' *Interest*, using a measure like *EBIT*.

In the context of this phase of the course, and the income statement above, it is the same thing as 'Operating Income.' However, as we advance, in practice, the two can differ. For example, next chapter we'll learn about 'Gains' and 'Losses' on the sale of long-term assets. You may recall from Chapter 1 that selling a long-term asset is considered an **investing activity**. For that reason, and because such sales are not regular occurrences, and are instead 'one-time' special items, and not part of the 'core operations' of the firm, they would be *excluded* from Operating Income. However, in that case, if we strictly define EBIT as just *Net Income* + *Interest Expense* + *Tax Expense*, then EBIT would not exclude those gains and losses. Therefore, while 'operating income' and 'EBIT' are closely related concepts, and sometimes can be the same, they can also be different.

This can be a bit confusing or frustrating at first. But business people get used to it. Remember that these '**levels of profitability**' are **tools of financial analysis**—they are **not GAAP quantities**. So, these are a matter of convention, the practices that analysts and business people use to do the analysis they want to do. So, different analysts may mean slightly different things by '**Operating Income**,' depending on the company they are analyzing, or the purpose of the analysis, or the firm they work for. Annoyingly, there is some inconsistency in practice in terms of how people classify *depreciation* and *amortization* (D&A). Sometimes, some people exclude D&A expenses from their definition of 'operating income,' because, they argue, D&A are *allocations* of past **investing** cash flows. Other people include D&A expenses in their definition and calculation of operating income, arguing that companies will need to continue investing in long-term assets (*Equipment, Patents*) to continue operating in the future.

For my exam, I plan to make my problems unambiguous for my students—if I ask you to calculate these quantities, I'll exclude any items that could cause ambiguity. (E.g., if I ask you to calculate 'operating income,' I'll give you an Income Statement with no Depreciation and Amortization.) For your internships and jobs afterwards,

ask people to clarify their precise definition of 'operating income.'

10.5.3 Multi-Step Income Statement

So, adding in these extra 'steps', our previous Income Statement would look like the below. Gross Profit comes right **below** COGS; **Operating Income** comes right **above** all the **'non-operating'** items, such as interest expense and tax expense—in this particular case, that's equivalent to **EBIT**.

Multi-Step Income Statement for the Fiscal Year Ending Dec. 31, 2020

Total Revenues	$120	
Cost of Goods Sold	($40)	
Gross Profit		$80
Salaries Expense	($20)	
Rent Expense	($10)	
Operating Income / EBIT		$50
Interest Expense	($10)	
Tax Expense	($9)	
Net Income	**$31**	

10.6 Capitalizing Shipping Costs

If you pay for **shipping** for your inventory (**'freight-in'** in the jargon of the business), how do you account for it? Here, the **rule is simple**, but the discussion around it is more complicated and interesting. First, **the rule**: We **add the shipping cost to that batch of Inventory**—and, by core accounting identities, that will, in turn, affect the COGS.

Example: Suppose our company is a retailer, and we buy **100 units of Inventory** from a wholesaler at a price of **$10,000**, but we also separately pay **$500** to ship the goods to our store. We account for **both** as part of the **Inventory asset**.

Inventory (+A):	$10,500	
Cash (-A):		$10,500

Purchase of 100 units of Inventory ($10k) and $500 of shipping

So, as a part of this batch purchase, we now have **100 units**, at a total **Inventory cost** of $10,500. This means that when it is time to **'expense out'** this batch as COGS, the inventory **cost per unit** will be: $\$10,500/100\ units = \$105\ per\ unit$.

This is something that would have seemed strikingly odd to you in the first week of this class, for understandable reasons. How does paying out money for shipping increase the accounting value of the Inventory asset? Isn't cash payment to the shipping company, a bad thing, a cost, something that decreases value? By this phase of the course, it may seem less shocking. By now, we are accustomed to the core principles of accounting, and how expenditures are frequently 'capitalized' as assets.

There are a couple of principles we can appeal to, in order to understand this **rule**.

- First, most generally, recall that **Assets** *are* 'deferred expenses'/'prepaid expenses.' So, by adding the **Shipping Cost** *to* the **Inventory asset**, we're not *denying* that it's an expense — we're just expensing it out *later* (via COGS), rather than *now*. So, by adding the **shipping** to Inventory, to be 'baked in' to the COGS on the sale date, we're achieving better **matching of expenses to their corresponding revenues**. To make this concrete, if we were to then sell and expense out 10 units from the batch above, which we had acquired at $100 plus $5 per shipping *per unit*, the COGS from that sale would be:

COGS (-S.E.):	$1,050	
Inventory (-A):		$1,050

COGS from Selling 10 units from the batch above

- Second, suppose that, instead of **charging for shipping separately**, our wholesaler simply **baked it into the invoice for the inventory itself**—much like the psychologically-manipulative fiction of **"free shipping"** from **Amazon prime**. Should the accounting be *different* in that case, based off of the way the invoice is written? Given the **rule** above—that we add shipping costs to Inventory—these different 'forms' will be accounted for identically.

Next chapter, we'll find out that this is a **pattern** for a **variety of assets**. In the early chapters of the textbook, we wanted to keep things simple, so we said that assets are written up at their 'purchase price.' But the reality is slightly more complicated than this. In fact, many assets are written up at their **purchase price plus all of the costs necessary to get them ready for use**. Shipping is the first example, but not the last.

11

Long-Term Assets Part 1: Complications

11.1 What do we know about assets so far?

We've been learning the broad theory of assets since the beginning of class. In the first lecture, we learned the FASB definition: "Probable future economic benefits obtained or controlled by a particular entity as the result of past transactions or events."

Initially we learned that companies record the value of their assets on their books at their actual **purchase price** (rather than the company's *opinions* about what those assets are worth). We appealed to the accounting principles of **verifiability and conservatism**. Later on, as we learned about accrual accounting, we characterized assets as 'deferred expenses': If you are going to use some resource over future periods, you 'write it up' or 'capitalize' it as an **asset now**, so that you can **expense it out later** on, **matching** the expense to the period in which it is used. We've talked about the **"general form of an asset"**:

Asset (+A)	$(Purchase Price)	
Expense (S.E.)	$0	
Cash (-A)		$(Purchase Price)

Purchase of Asset, date during reporting period
(External Transaction)

Related Expense (-S.E.)	$(Amount Used Up)	
Cash (A)		$0
Asset (-A)		$(Amount Used Up)

End-of-period adjusting entry for expense related to asset, 12/31

And that is **still the basic theory**, at a high-level. What we will learn in this chapter is a bunch of **caveats, details**, and a couple of things that might *look like* exceptions to that rule. And we'll talk about how to **interpret the financial statements** that are produced by these accounting rules, given these complications.

11.2 Complicating and caveating 'purchase price'

11.2.1 Capitalizing costs for 'getting ready for use'

Earlier in the course, we repeated the mantra that 'assets are initially written up at their purchase price.' The reality is slightly different: assets are written up at the **purchase price paid to the seller plus the costs the company incurs to get the asset ready for use**. The mantra we repeated earlier wasn't really a lie, but, instead, an *elision*: It remains the case that accounting **primarily relies on 'historical costs'** to determine the initial value of the asset (i.e., what the company actually paid, rather than what it *wants to believe*). It's just that, now, we learn that this includes capitalizing certain **additional costs involved in the preparation** of the asset.

This relates to the discussion from the last chapter, of why **Shipping** costs are capitalized in **Inventory**. Since retailers must pay shipping in order to get their *Inventory* in a place where they can sell it, under the **matching principle**, the expense should be allocated to the period in which the goods are actually sold. But if those costs will be expensed out later, they can't be expensed out now—so they are first capitalized in *Inventory*, and thus to the *COGS* recorded on the date of the eventual sale. The same logic applies to other assets as well.

That's the accounting **principle**. But note that managers could potentially **use** that accounting principle **opportunistically**. Capitalizing something as an asset rather than immediately expensing it means that the company will report a higher asset balance and net income in that period. As such, U.S. **GAAP** provides a decently high level of **detail on what specific expenditures can be capitalized.**

Those specifics vary by assets. For example, for *Land*, the costs of "attorney, real estate commissions, title, title search, and recording fees" will be included. For buildings (i.e., *Plant*), "realtor commissions and legal fees" are included. And for Equip-

ment, "sales tax, delivery insurance, assembly, installation, testing, and even legal fees" count. Sometimes, companies will have to **make up back taxes** in order to be given legal/regulatory permission to make certain purchases. If paying a back tax is a **condition of initiating use of the asset**, that will count as well. However, **recurring costs** such as annual property insurance premiums and taxes are **fully expensed as they recur**, rather than capitalized (Spiceland et al, *Financial Accounting*, 5 ed., pp. 345-347).

For the purposes of this introductory course, the key overarching concept is to consider whether the cost is **non-recurring** and **a condition of initiating the use of the asset**. If so, you can assume the cost is capitalized in the asset. If not, not.

11.2.2 Subtracting out salvaged materials

The flip side of the above is that we also must **subtract** the value of materials or benefits that are **salvaged** and then **sold** off from the original asset. This is something that probably would have seemed strikingly **odd** in Week 1 of this class. How does getting and selling something of value **decrease** the value of the asset?

Note that if a company salvages some material from purchased land, and then sells it for *Cash (A)*, and deducts that amount from the value of the *Land (A)*, the **total asset balance** of the company will remain **unchanged**. This will just **re-allocate** that value from *Land* to *Cash*. To make sense of this, consider the following thought experiment.

"Pot of Gold" thought experiment: Suppose that we buy a piece of *Land* from a seller, and both we and the seller know that the land had a pot of gold on it. If so, then that pot of gold would factor into our negotiations, and the eventual price at which we strike a deal. If we, like most companies, don't have a separate account for 'Pot of Gold,' that full negotiated purchase price would be initially allocated to the *Land* account. If we subsequently removed the pot of gold from the *Land* and sold it off for *Cash*, but *didn't* reduce the *Land* account, it would be as if we were **double-counting** the pot of gold, and over-reporting the remaining value of the *Land*. That pot of gold was already factored into the **purchase price**, and, thus, initial accounting valuation of the *Land*. So, if we sell it off, the balance of *Land* should be reduced by the same amount.

Generalizing, companies usually have an **initial expectation** that there will be some **salvageable materials** on assets they purchase, so we assume that that is **already factored in** to the transaction price; and the subsequent sales of those salvaged materials are not unexpected 'gains' but are *re-allocations*.

11.2.3 Practice Problem: Capitalizing and Subtracting

Problem: MattCorp purchases Equipment from a seller for a price of $10m. MattCorp pays legal fees of $500k to secure title, as a part of the transaction; pays back taxes of

$250k in order to begin operating the equipment in the state; pays a recurring annual $1m insurance premium to insure the Equipment; and salvages scrap materials from the equipment that it then sells for $1m in Cash. What would be the initial carrying value of the Equipment on MattCorp's books (i.e., after all these events but before any subsequent depreciation expense)?

11.3 Selling off or disposing of an asset: Gains and Losses

One thing that's missing from the 'general form of an asset' we've discussed to date (purchasing an asset and then expenseing it out as it is used up), is the **final step**: Either selling the asset off or disposing of it. (One of those two will have to happen *eventually.*) The **accounting** for this is relatively **simple**, but the implications are quite **interesting**—and they introduce a new category of accounts.

11.3.1 Gain on the Sale of a Long-Term Asset

Consider the following example: Suppose that on Jan. 1, 2020, our company bought a piece of **Equipment** for $10 million, and assumed a useful life of 10 years, zero salvage value, and straight-line depreciation—i.e., $1m of depreciation each year. Now, fast forward to January 1, 2025. The Equipment **now has a book value** of $5m (i.e., $\$10m - 5 * \$1m$). Suppose we now decide to sell the Equipment, and fetch $6m in Cash upon the sale. How do we account for this?

The *intuitive* way to think about this is like so: We are getting **$6m in Cash** (an asset), but we are extinguishing the *Equipment*, an asset that has a net / **book value of $5m**. And so we need a **$1m 'plug'** to balance things out. And we can infer that this 'plug' **must increment *Shareholders' Equity***: The value of the *Cash (A)* we gain from the sale is greater than the book value of the real asset we discharged, **so our *net assets*—another way of saying Shareholders' Equity—increased.** We call this plug a **'Gain,'** and treat it as a contributor to Shareholders' Equity (like *Revenue*) accordingly. So, the way *I think about* this is like so:

Cash (+A):	$6m	
Equipment at book value (-A):		$5m
Gain (+S.E.):		$1m

Gain on Sale of Equipment: Intuition / logic / 'white lie'
(NOT technically correct)

But, in reality, there's **one extra step here**. As we learned in Chapter 5 many companies keep separate accounts for **Equipment (A)** and its **Accumulated Depreciation (contra-A)**. So in that case we would need to separately extinguish them. So, the **technically correct journal entry** is:

Cash (+A):	\$6m	
Accumulated Depreciation (-contra-A):	\$5m	
Equipment (-A):		\$10m
Gain (+S.E.):		\$1m

Gain on Sale of Equipment: Dirty truth (technically correct)

Written that way, it looks intimidating and unwieldy. That's why I showed the more intuitive, technically incorrect, version first, where a 'Gain' is just a plug between the book value and the sale price. But, as you can see, in the 'technically correct' version, the Gain is still that same number and plug. To solve these problems, I recommend first **thinking about** that **intuition**, and then **reminding yourself** to deal with the **extra step** for the Accumulated Depreciation contra-account.[1]

11.3.2 What is a 'Gain'?

So what exactly is a 'Gain'? It's something that *behaves* like a revenue—contributes positively to net income, on the income statement—but isn't one. We need to account for this gain, for things to balance. Our **net assets** have increased as a result of the sale, since the *Cash (A)* we got was greater than the **book value** of the real asset we just got rid of. But the sale of long-term assets is not part of the 'core,' typical **operations** of the firm. We generally don't expect Gains to be 'persistent' (repeatable) like revenues from sales of goods and services. So, we want something that increments Net Income, but isn't a Revenue—we call that thing a 'Gain.' (Note that Gains would be excluded from *Operating Income* in the multi-step Income Statement, from Chapter 10.)

How do we interpret a Gain? Is it good news? It'll be easiest to answer this question once we look at a slightly different scenario, with a different result.

11.3.3 Loss on the Sale of a Long-Term Asset

Suppose everything 'real' above was held constant (i.e., the real purchase price, use and sale of the asset were all the same), but the management of the company had ini-

[1] Companies can also **dispose of** assets. As you would logically expect, the basic concept is identical. If the company disposes of the asset for nothing, it is as if \$0 is the 'sale price' and everything else is the same. If the company salvages materials and sells them for \$X, it is as if \$X is the 'sale price.'

tially decided to make a **more aggressive depreciation assumption.** E.g., suppose the company had initially assumed the **useful life of the asset would be 20 years**. This, in turn, would mean the annual **Depreciation Expense** was **$500k**, and the accumulated depreciation as of the sale on January 1, 2025 would be $2.5m, leaving a **book value of $7.5m**. So, when the Equipment is sold for **$6m in Cash**, we once again need to **plug the difference**—but this time, it needs to go **in the opposite direction**.

When an **asset sells for less than its book value**, the 'plug' is called a **'Loss.'** And, *Losses* are just the opposite of *Gains*, so everything in this case is symmetric to that case. Our ***net assets*** have decreased as a result of the sale. So, the 'plug' must **decrement** *Shareholders' Equity*, like an expense. But, we do not wish to *call* this an expense, since it is not part of the company's core, recurring operations. So, instead, we create a new category, and call this a '*Loss*.' And, to get things **technically correct**, we once again need to remember that **Equipment** and **Accumulated Depreciation** are tracked in **separate accounts**, and need to be extinguished separately. So, the technically correct journal entry is:

Cash (+A):	$6m	
Loss (-S.E.):	$1.5m	
Accumulated Depreciation (- contra-A):	$2.5m	
Equipment (-A):		$10m

Loss on Sale of Equipment, January 1, 2025

Now, note that we've **gone from a 'Gain' to a 'Loss,' holding all the 'real' transactions fixed, just by changing the initial *estimate*, the depreciation *assumption***. If you find this weird, and arguably problematic, you should!

11.3.4 Are gains (vs. losses) good (vs. bad)?

So, does a 'Gain' vs. 'Loss' mean 'good' vs. 'bad' news? Not really. Or at least a 'gain' (vs. loss) does not mean that the company did a good (vs. bad) job using or selling the asset, or made a wise (vs. unwise) choice to sell at that price. Gains and Losses simply **are what they are**, by definition: The difference between the book value of the asset and its realized sale price. And the **book value** of the asset is determined by the accumulated depreciation charged to the asset, which, in turn, is a function of **past, subjective managerial estimates.**

So, what a Gain really *means* is that the **accounting depreciation** you charged to the asset in the past was **greater** than the **real economic depreciation** (reflected in its

subsequently realized sale price).[2] So it **doesn't** necessarily mean that we made a **good choice** to sell the asset. But, it does mean that, because the depreciation expenses we assumed in the past were too high, we need to 'correct' for that by adding the gain back, via net income (and thus to RE and SE).

Gains and Losses are also common suspects in "earnings managment" — techniques that managers tend to use to 'massage' their reported net income over time. For example, managers might **intentionally over-depreciate assets** on their books (i.e., in accounting terms) in order to 'store up' the ability to sell the asset and realize a 'gain' in the future. That way, if, e.g., the company has a bad year in terms of sales, it can use the gain to **buffer** its earnings. Savvy analysts are on the lookout for these gimmicks, and know how to adjust for them. Remember that gains and losses are **excluded** from **Operating Income** in the **multi-step income statement**.

11.4 Other depreciation 'patterns' and methods

Depreciation expense is one of the largest expense items on companies' income statements. Here are the things we've learned about depreciation to date:

1. Accounting depreciation is accounting's way of **apportioning** the **net cost** (that is, purchase price minus salvage value) of assets across the period of their use.

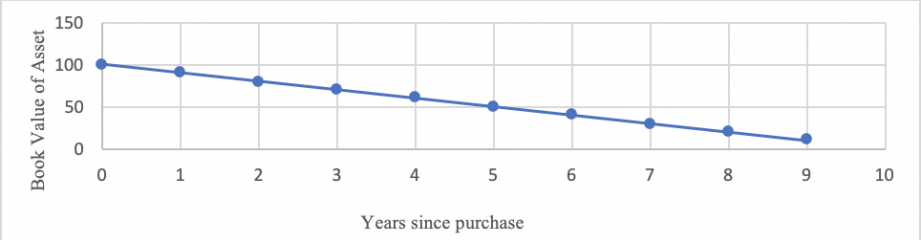
2. It does not necessarily equal the 'real'/economic depreciation of the asset.

3. It is justified by the 'matching' principle: Since investments in assets will be used to generate revenues over many periods, we first write those assets up, then expense them out over time as depreciation.

4. Accounting depreciation is based on managerial *estimates* about the future and, thus, unverifiable and potentially manipulable for "earnings management."

Those are still the **high-level ideas**. But, to date, since we've been focusing on the concept, we've only talked about one kind of depreciation **method**—and, in particular, the very simplest kind, **straight-line depreciation**. In straight-line depreciation, we apportion the **depreciable value** (purchase price minus estimated salvage value) **evenly** over **time**. So, concretely, suppose we bought an asset for $100 on January 1st of some year, and expected to sell it for $10 9 years later. Then the **depreciable value** would be $90, and we would record $10 in *Depreciation Expense* each year. So, the **book value** of the asset would decline as the **eponymous straight line**, over time:

[2] Everything here applies in reverse/symmetrically to losses on the sale of an asset. I.e., losses just indicate that the accounting depreciation you charged was less than the real economic depreciation. I'm just trying to keep the sentences manageable here.



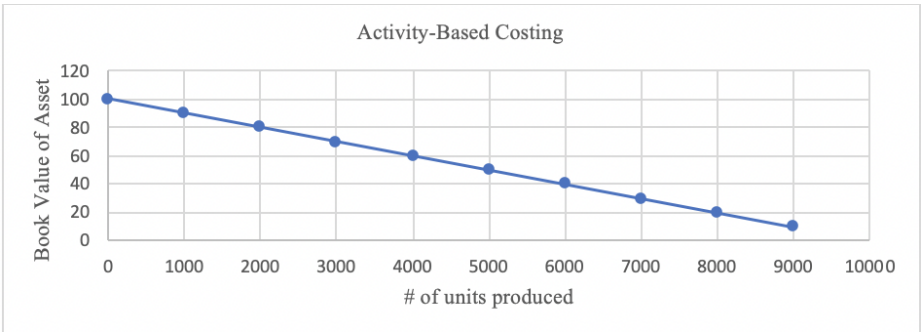
But, in principle, there are **any number of other ways in which we could apportion the expected net cost (depreciable value)** of the Equipment over the period of its use.

11.4.1 Activity-Based Depreciation

Instead of apportioning the expense **evenly per year**, we could instead **apportion it evenly per unit produced**. This is what we call **activity-based costing**. And it's quite intuitive. As before, we estimate what the salvage/residual value of the asset will be at the end of its useful life. The difference between that value and the purchase price is, once again, the *depreciable value*. But, then we estimate **estimate** how many **units** we expect the Equipment to produce over that time period. And then we evenly allocate that depreciable value on a **per-unit** basis.

$$Depreciation\ exp.\ per\ unit = \frac{Purchase\ Price - Salvage\ Value}{Expected\ no.\ of\ units\ to\ be\ produced}$$

Note that with activity-based costing, the book value of the asset will once again be a 'straight line,' just with the **numbers of units produced on the X-axis,** instead of years.



However, in any given **reporting period**, the depreciation expense will **vary** depending on **how many units were actually produced** in that period. So the pattern of depreciation expenses and the Accumulated Depreciation T-account will be **uneven**, on a **periodic basis**, even though the expense is **evenly** allocated on a **per-unit basis**. So, for example, if we purchased some Equipment at the beginning of 2021, and did annual reporting, then our *Accumulated Depreciation* account at the end of 2023 would be like so:

Accumulated Depreciation (contra-A)
$(Depreciation per unit * units produced in 2021)
$(Depreciation per unit * units produced in 2022)
$(Depreciation per unit * units produced in 2023)
...

Why do companies choose to use activity-based depreciation, or not? There is a quite persuasive **argument in favor** of this method: By allocating expenses on the basis of the actual units produced, it seems it could do a **better job of matching the expenditure on the equipment to the revenues** it generated, a major principle and goal of accounting. And, indeed, many academics and consultants advocate for it on that basis, arguing that it gives a better picture of a company's profitability.

Why don't all companies use it, then? It can be **difficult to forecast** how productive a new piece of equipment will be. And so, in turn, when companies use activity-based costing, it may be difficult to forecast annual depreciation expenses; or, they could produce many more units than expected, and need to make an awkward adjustment to keep its book value above zero. Another reason is simple **convention**: People and firms are more accustomed to time-based straight-line depreciation, and **norms** inside companies are **sticky.**

11.4.2 Accelerated Depreciation Methods

Another thing companies can do is use a **time-based** pattern of depreciation, but **vary the rate per time-period**. By definition, **'accelerated depreciation'** is when companies charge **higher depreciation expenses earlier on**, and, in turn, lower expenses later on in the asset's life.[3] Many companies use accelerated depreciation schedules for most of their long-term tangible assets.

Why do companies do this? A normative argument is that this may, in some cases, provide better **matching**, for assets that are expected to be **more productive in the earlier years** of their use. A more pessimistic reason is that companies may want to better 'manage' earnings. They may want to record higher depreciation earlier on so that they can then show more 'growth' in the future, or store up the ability to recognize a Gain upon the sale.

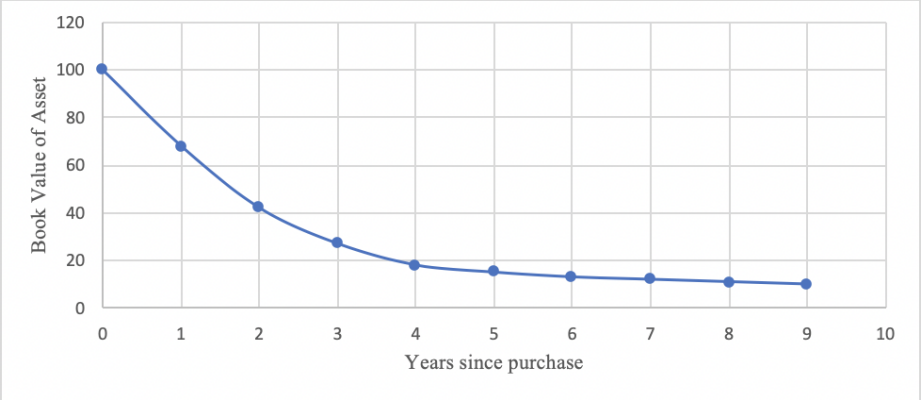
Formalizing, by definition, *accelerated depreciation* is when the depreciation expenses are higher earlier on. So, the T-account for Accumulated Depreciation will be some instantiation of this general forms:

[3] This can confuse first-time learners, because 'accelerated' depreciation is, as it were, decelerat*ing*.

Accumulated Depreciation T-Account (Accelerated Depreciation)
$X
$Y
$Z
...

...where $Z < Y < X$.

And the pattern of the asset's book value over time will look something like this:



That's the definition of accelerated depreciation. And, in principle, there are infinite ways in which a company could depreciate their assets that satisfy this definition. For those of you with calculus background, you may note that there are *infinite convex curves* that could take us *from* the purchase price down to the estimated salvage value. In many introductory accounting courses and textbooks, for historical reasons, they teach **one particular method** for doing this, the **double-declining balance method**. However, this method has **no special logic** to it, and a number of **illogical flaws**. Therefore, I do not teach it in my course, and instead just expect my students to understand the **concept** of accelerated depreciation. (If you're desperate to know the method, you can Google it.)

11.5 Do not depreciate Land: Why?

Here's a new **rule**, worth memorizing:

- You do not depreciate Land.

If you just want to know the rule, you can stop here. But why is this the rule? And does it contradict the theories we have learned previously, in particular, the core axiom that 'expenditures on assets are apportioned out as expenses over time'?

The answer is that there is **no strict contradiction**, but understanding why requires some precision. Recall that when we **depreciate** Equipment, we **don't** always expense the **full purchase price** out as depreciation. Instead we expense out the **depreciable value**—the purchase price minus the expected salvage value. Put differently, we expensed out the **net cash outflow** from acquiring and then disposing of the asset.

The argument made by accounting standard-setters is that **Land is not a 'wasting' assets**, in the way that a factory or piece of equipment is. We do not, by default, *expect* its value to decrease (or increase) over time.[4] And so the **expected net cash outflow** is, by default, **zero**. We expect that we could sell the *Land* for the same value in 5 years as we bought them for today. So we **don't** reduce that asset without **special reason**. Put differently, it's as if **Land** is an asset where the expected **salvage value** is **equal** to its **purchase price**, so the **depreciable value is zero**.

Does this mean that Land is **"free"**? Can companies just buy Land extravagantly, with no sensitivity to their cost, and never incur an expense? Not quite. Companies **still need to test these assets for impairment** (next chapter), as with other long-term assets. So, *Land* balances can be reduced if "fair value" (which we will cover in the next chapter) falls below the purchase price. Also, purchases of *Land* need to be paid for somehow—that is, they must be financed by debt or equity. If they are financed by debt, there will be associated interest expenses. If they are financed by equity, shareholders will pay attention to that dilution, and expect an appropriate return on their investment. So purchasing these assets is not 'free' in accounting terms.

11.6 Intangible assets: interpretation and amortization

The universe of assets can be divided into two mutually exclusive and collectively exhaustive categories: **tangible vs. intangible assets**. Tangible assets are assets that have real 'physical substance,' like Land, Equipment, etc. And **intangible** assets are those that **do not have physical substance**—things like Trademarks, Patents, etc.

In terms of accounting rules and journal entries, there is nothing new when companies *purchase* intangible assets. As usual, we write them up at the purchase price, and then expense them out over the time period of their use. For most tangible long-term assets, as we know by now, that expense is called *Depreciation*. For **intangible assets, the analogue is called *Amortization***.

For our purposes, we will always assume **straight-line amortization**. So, if we buy a **Patent** for **$2m** on January 1, 2021, and assume a useful life of **20** years with **zero**

[4] With **Land**, this relates to the notion of *market efficiency* in finance. If you were confident that the value of a parcel of land were going to decline in the future, why would you buy it at that price? If you could be certain that the value would go up in the future, why would the seller sell at that price? So, arguably, our best estimate of the **future** value of **Land** is its current value.

residual value (once the patent expires), then we would recognize annual amortization expenses like so:

Amortization Expense (-S.E.):	$100,000	
Patent (-A):		$100,000

Annual Amortization of a Patent, Dec 31, 2021:

The more **interesting issue** is the **debate** over the initial recognition of intangible assets. People commonly claim, in the press and public conversations, that 'accounting numbers do not recognize the value of a company's intangible assets.' This is not really true. The truth is that accounting does recognize the value of intangibles that meet the FASB asset criteria, just as it recognizes tangible assets that meet those criteria. If an **intangible asset is acquired via a purchase**—such as Trademarks or Patents purchased on the open market—it will be recognized.

The **controversial** issue has to do with intangible assets that are **developed internally**, rather than purchased—e.g., the patents and intellectual property that the company creates as a part of its Research and Development (R&D). Under **U.S. GAAP**, the **current rule** is that the money that companies spend on their **internal R&D** must be **fully expensed** in each period, rather than capitalized as an asset.

This is controversial for two reasons.

- First, according to core accounting principles, if that R&D will help create valuable products, those expenditures should **ideally be matched** to their future sales.
- Second, many people fear that this has **socially undesirable** consequences. They fear it makes companies less inclined to invest in **R&D** that may have positive **externalities** that could benefit society as a whole.

But the FASB believes that expenditures on R&D cannot be **verifiably matched** to future sales with **sufficient certainty**. As such, it could be very problematic to allow companies to capitalize those expenditures as assets as they please.

So, **the FASB has a point. But so do the critics**. There is no doubt that many companies have intangibles that are real 'economic' assets, but which cannot be recognized on their books—e.g., Apple with its trademarks, and pharmaceutical companies with their internally-developed patents. And this has implications. It means that companies that are **investing in internally developing** R&D and other intangibles may have low or negative net income, because those **'economic' investments** are fully recorded as **expenses** in the company's **accounting**.

The flip side, however—which the CEOs of these companies are less inclined to note—is that once those investments start to pay off (e.g., a pharmaceutical development company passing a clinical trial, and then selling its drug), those companies will have *overstated* net income (and ROA and ROE), because the economic investments in developing those intangibles were **already fully expensed** in past years.

11.7 Contemporary issues: Discussion Questions

11.7.1 Assets, investments, and intangibles, and implications

Some of the things that we have learned in this chapter are relevant to contemporary conversations and public controversies. For example, it's common to hear CEOs of companies claim that "The reason that we are not profitable is that we are investing in our future." Is this a reasonable claim to make? Based on what we've learned here, there's reason to be *somewhat* skeptical of such claims. As we learned in Chapter 1, when companies *invest* in *purchasing* assets, we *capitalize* that expenditure as an asset, and expense it out later. So, that kind of investment is not really an excuse for being unprofitable right now. However, if a company **develops intangible assets internally** (such as research and development, or advertising expenditures designed to increase the value or a brand or trademark), those will generally be *fully expensed*. So, when CEOs claim that they are unprofitable because they are investing—the truth depends on the type of the investment.

Finally, it's common to hear claims, in the popular press and on CNBC, that "Accounting does not recognize the value of intangible assets." And, as we've seen, that's *not quite correct*. In fact, accounting recognizes acquired (purchased) intangibles on the Balance Sheet, but not *internally-developed* intangibles. Those internally-developed intangibles are significant, and do matter, increasingly in recent decades. (Consider, e.g., the value of Apple's brand value, and its proprietary hardware design, and software.) In fact, in recent decades, by various measures, firms' 'book value' has **increasingly diverged** from their market value. And this is often attributed to the growing importance of these internally-developed intangibles.

So, if the claim is that "accounting does not recognize the the value of intangibles *on the Balance Sheet*," this statement is *partially true*. However, ***going even deeper still***, I (M. Shaffer) would argue that accounting "recognizes" the value of intangibles on the *Income Statement* every time our company makes a sale, in our *margins*. What do I mean by this? A company is able to command premium prices on its products, in its sales to its customers, thanks to things like brand value, unique R&D, customer goodwill, etc. So, the 'value' of those intangible assets may not be recorded as "stock" measures on the *Balance Sheet*, but they *are reflected*, implicitly, in the *Income Statement*,

in our margins.

12

Long-Term Assets Part 2: Fair Value

12.1 Introducing 'Fair Value'

12.1.1 What if purchase price is unavailable?

Sometimes, a company gets a thing that counts as an **accounting asset** under the FASB definition above, but there's no **purchase price** that we can appeal to. How can this happen? There are several different situations in which this might happen, but I'll start with one example: a **basket purchase**. In a basket purchase, the company buys several different things that fall into different **asset accounts**, for one purchase price from one seller. This might sound odd, but is actually quite common.

For example, suppose our company buys a **factory and the property** it is on, for $1 million. This—buying the property together with the factory—would be *the rule, not the exception*. But, for our **accounting purposes**, it's a challenge, because the *factory* itself should be in the **Plant** account (or, aggregated with **Property, Plant, and Equipment (PP&E)**, while the *property* itself should be separately tracked in the **Land** account.

So, in this situation, our company has two different assets, that must be allocated to **two different accounts**, but only **one purchase price**. We know that the total **Cash** credit is $1m; and **total credits must equal total debits**; so that **total** amount must be balanced by debits to those asset accounts. But how much to each? Here's a journal entry representing what we know so far, and the **state of our ignorance**:

Plant (+A):	$???	
Land (+A):	$???	
Cash (-A):		$1 million

Basket purchase, 4/4/2021

What do we do? Here, the accounting rule is that companies must **apportion** the **total purchase price** based on the assets' **relative** estimated **"fair value."**[1]

Example: Suppose that our company, in consultation with our appraisal/valuation experts and advisers, estimates the "fair value" of the **Equipment** and **Land** to be **$660k** and **$440k**, **respectively**. Those two **appraisal estimates** add up to $1.1 million. But the verifiable total purchase price, and Cash credit, was $1 million. So, we would apportion that total purchase price $1m, to the two assets proportionally, with the *proportions* determined by the appraisal estimates. $660k is 60% of $1.1 million and $440k is 40%. Visualizing:

Appraisal Estimate

Account	Amount ($)	(%)
Plant	$660k	60%
Land	$440k	40%
Total	$1.1m	100%

Accounting Allocation of Total $1m Purchase Price

Account	Estimated / Appraised Fair Value (%)	Accounting Allocation ($)
Plant	60%	$600k
Land	40%	$400k
Total	100%	$1m

And so, applying this rule, the journal entry for this basket purchase would be:

[1] These days, companies often get specialized **appraisal/valuation firms** to do these fair-value estimates.

Plant (+A):	$600k	
Land (+A):	$400k	
Cash (-A):		$1m

Basket purchase, 4/4/2021, w/ relative fair value estimates:

12.2 What exactly is “fair value”?

That’s a great, deep, and important question, and it’s difficult to answer in a totally straightforward way, at this point in your undergraduate business education. The bottom line is that “fair value” is the term used in accounting for an estimate of the **“true value”** of an asset, ***other than* its purchase price**, which is **sometimes** considered **allowable** under GAAP.

What does ‘true value’ mean? Another great question. There are **two different notions**, which largely **converge** together in the world of **financial theory**.

1. The first notion of fair value is: ‘What you could sell the asset for in an arms-length transaction in a fully competitive marketplace.’ ‘Arms-length’ here means business parties that are **legally separate**, and do not share common ownership or interests that would bias them away from contracting at a truly **competitive** price. This should remind you of arguments from your economics classes, about how, in competitive markets, prices are ‘efficient.’

2. The second notion of fair value is roughly what we call ‘**fundamental value**’ in the world of finance: ‘The **present value** of all the future net cash flows the asset will generate.’ **Present value** means that those **expected future** cash flows are **discounted**—not valued 1-for-1—because they are in the future and are *risky*. We’ll discuss this core **finance theory** in depth in the **next chapter**.

In the world of financial and economic theory, those two definitions **converge** together, because the amount that buyers will pay in a competitive market should be the **present value** of the future cash flows. Otherwise, it implies that people are leaving “money on the table.” (Remember all the arguments about **‘equilibrium’** from your economics classes.)

How exactly these fair values are **calculated** is the subject of **valuation**, which is an application of **financial theory**. We will cover that next chapter. **For now**, for the purposes of this chapter, we just need to know **what to do with ‘fair value’ for accounting purposes**, once fair value is calculated. So here’s our practical definition for now:

For now, 'fair value' is a number that gets **spit out** by a **'black box,'** and is supposed to be an estimate more like **'true value.'** It is *sometimes* **allowable and used** in GAAP accounting. For now, we just need to know **what those situations are**, and how to account for them, using the number we get from the **'black box.'**

12.3 Where else is 'fair value' used?

12.3.1 When there is no cash involved

Let's make this more concrete. When **investors invest** cash in a company they get shares of **common stock**. This was Transaction #1 in the beginning of this course:

Cash (+A):	$50k	
Common Stock (+S.E.):		$50k

Stock-for-cash (Transaction #1)

But, there's nothing that stops companies from **striking other kinds of deals with current and potential investors**. Suppose that our company wants to **buy equipment** from another company, but **doesn't have cash** available. Our company could **pay** for the asset **with shares** of our common stock. (This is in fact common practice among cash-constrained startups, which could pay part of their rent by issuing equity to their landlord.) In other words, we could **swap shares for equipment**. This would have the same form as Transaction #1, with only one change: we get **Equipment instead of Cash**. No other asset or liability is affected by this transaction. So the journal entry must be some form of:

Equipment (+A):	$???	
Common Stock (+S.E.):		$???

Stock-for-equipment swap (our company's perspective):

But what is the precise **amount**? There is **no purchase price** that we can appeal to or rely upon. So here, accounting must **rely instead upon an estimate of the fair value** of the Equipment and/or shares. For a publicly-traded company, you could easily use the **price the shares trade at in the stock market** as an estimate of that fair value. (For a smaller, private company, you might need to rely on a valuation model of the company's shares or the equipment. But, for our purposes whatever the 'black box'

spits out as fair value is the number we use in this situation.) Suppose that the company is a large, publicly-traded company, and on the date of the deal, its shares are trading for $50 per share, and it exchanges the Equipment for 1,000 shares. Then, the entry would be:

Equipment (+A):	$50,000	
Common Stock (+S.E.):		$50,000

1,000 shares-for-equipment swap (our company's perspective):

12.3.2 When a 'purchase price' can't be relied upon

Previously we've said that when a company buys something in an **arms-length transaction in a competitive market**, the **purchase price** is **reliable**. This statement may become more palpable when we contrast it to the **opposite situation**:

Related Party Transaction:

Suppose that there are two distinct legal corporate entities, Corporation A and Corporation B. But, although they are legally separate entities, **Corporation A controls Corporation B**, by owning more than 50% of its voting shares. That is, **Corporation B is a subsidiary** of Corporation A. Now, suppose we observe the following behavior: First, **Corporation A** buys a piece of real estate from an **outside party** for **$1m**. Then, a month later, Corporation A sells the real estate to **Corporation B for $5m**. Should Company A be able to recognize a 'gain' on the real-estate, and increase its net income and shareholders' equity by $4m?

Instinctively, this situation seems corrupt, or at least somewhat **unreal**. The 'purchase price' in this case does not seem to be 'real' or reliable, because it is not *competitive*. It doesn't seem like Corporation B bought that piece of real estate for $5m because it believed that was the **best deal** available to it. It seems like it bought it because it is controlled by Corporation A, and was **told to** do so. This is one example of the general notion of a **related-party transaction**. This is a highly technical area, and so we won't cover all the details in this introductory course. For now, what we need to know is that, in such situations, a quoted 'purchase price' may not be considered reliable (and why)—and, as a result, 'fair value' can come into play.

Adam Neumann WeWork Example:

Or consider another high-profile example, (featured, like many of the best case studies in this class, in a Netflix documentary). Adam Neumann was **founder, controlling**

shareholder, and CEO of *WeWork*, a business that *subleased* hip working spaces to startups and provided co-working spaces for remote workers.

Early in the company's history, *WeWork* (the corporate legal entity) bought a trademark—the word "We"—from Adam Neumann (the person) for $6m.

Then, in 2019, WeWork was planning to go public in an IPO, which would require filing public financial statements according to GAAP.

Discussion question: Suppose WeWork had gone public as planned in 2019. Should it have valued the *Trademark* on its books at the $6m purchase price?

Intuitively, this situation seems fairly *corrupt*. Economically: This "purchase price" does not seem real / competitive. Adam Neumann was, himself the controlling shareholder and CEO of WeWork, the corporate entity. So, WeWork didn't "shop around" for the best deal in purchasing this trademark. So, that $6m transaction price doesn't seem like a "real" / reliable / "market" valuation. Hence, WeWork's auditors would likely push back on that number before filing public GAAP financial statements. (And, separate from the accounting issues here, there's also obviously a *moral* issue as well. The WeWork IPO eventually fell through, and, under public scrutiny and pressure, Neumann eventually paid the company back the $6m for the trademark.)

12.3.3 In a variety of asset impairments and writedowns

In Chapter 1, we introduced the core accounting principle of "conservatism," that accounting rules force managers and companies to err on the side of *understating* the value of their assets, and briefly mentioned the idea of "writing down" assets, when their value fall below historical cost, but, asymmetrically, *not* writing them *up*. Now, it's time to fill in the technical details.

Under GAAP accounting, companies are required to "test" long-term assets for "impairment." If they determine that those assets are, indeed, "impaired," they write those assets *down* (a credit) to their estimated "fair value," and record a **'Loss' (-S.E.)** (as the matching debit).

What is a **'Loss (-S.E.)'**? This is the *same account* we used in the case in which we sold a long-term asset for less than book value. As before, for practical purposes, a **Loss 'behaves' like an expense**—it is subtracted from *Revenue* on the Income Statement, and thus *decrements* Net Income—but **is not called an expense**.

Why not call it an expense? Given accounting **conservatism**, we want to write the impaired asset **down**. And, as we know, the Income Statement and the Balance Sheet need to be kept in sync. So, this must 'pass through' the Income Statement as well. But **impairments are not** part of the **'core'** operations of the firm—they are not expected to be **'repeatable'** or **persistent** like Salaries Expense or Depreciation. So, we want

something that is like an expense, but **classified separately**. That's what a *Loss* is.

So, summarizing, the accounting principle for **impairment** is:

- **Estimate the fair value** of the asset (with assistance of valuation experts).
- If 'Fair Value' $\geqslant$ Book Value: No change. Do nothing (accounting conservatism).
- If 'Fair Value' $<$ Book Value, recognize an impairment.
  - Write the asset down to the estimated fair value, balanced by a 'Loss,' with a journal entry like the below.
    - (Note that to bring the book value *from* the former value to the fair value, we must credit it for *the difference*.)

Loss (-S.E.):	$(Book – Fair Value)	
Asset (-A):		$(Book – Fair Value)

Impairment of Long-Term Asset, after testing, 7/19/2021:

Concretely, suppose the Book Value of the asset *was* $100. Then, today, we suspect that it might be impaired, so we 'test for impairment,' and estimate that its Fair Value is now $80. Then we would need to credit (reduce) the asset by $20, and recognize that as a *Loss*. And the *balance* of the asset account after this impairment would be $80.

Note: Impairments disrupt our simple formula for asset balances!

In earlier chapters of the course, the only things that *increased* (debited) operating assets were *purchases*, and the only thing decreased them were *expenses*. This means that we were able to use this simple formula for many problems:

$$Asset\ End.\ Balance = Asset\ Beg.\ Balance + Purchases - Related\ Expense$$

Impairments throw a wrench in this. How so? They obviously reduce the asset balance, without being registered as an expense. This is one reason why it's better to focus on understanding the accounting principles and their *meaning*. If you understand impairments and losses, you should still be able to solve similar problems, without relying on a formula. Hopefully, you can now understand this more general formula:

$$Asset\ End.\ Bal. = Asset\ Beg.\ Bal. + Purchases - Related\ Expense - Related\ Impairment\ Loss$$

For practical purposes, if a problem like this—on the relationship between asset balances, expenses, and purchases—does not specifically indicate that an impairment occurred, you can assume it did not. But when it does, you should be able to handle it.

The white lie and the more complicated truth

As is often the case, for the purpose of this introductory course, I first focused on providing a simple and coherent mental picture, of the main **overarching principle**, the idea of **"book value" vs. "fair value,"** and the **asymmetry** of impairment testing (that we write assets down to fair value, but not up). And that is the main important idea.

But, unfortunately the truth is that the FASB makes things **more complicated for some assets**. For some long-term assets, there is instead a **"two-step impairment test,"** where the company first determines whether the (undiscounted) **net cash flows** (rather than "fair value," the *discounted* expected future cash flows) is less than the book value. That is, in reality, for these assets, the real, two-step process is:

1. If the (undiscounted) net cash flows are determined to be less than the book value the asset is said to be "impaired" (Step 1)

2. and the asset is then re-valued and written down to "fair value" (Step 2)

This is another area where the rules from the FASB have changed in recent years and seem likely to change in the future. Hence my desire to first focus on the main overarching concept, book value vs. fair value, rather than the details of which assets have a "two-step impairment test." Suffice to say that, for the purpose of my exams, I don't plan to trip you up with minor procedural details—in the problems I write, it'll be unambiguous with either *both* net cash flows and fair value being less than book value (indicating impairment and a writedown to fair value) or *both* of them being greater than book value (indicating that we do nothing). But I wanted to reveal this truth now, so that you are not misled, or surprised when you see other sources revealing the more complex truth.

12.4 Corporate Mergers and Acquisitions and Goodwill

One of the most contentious, complex, and important areas of accounting is **Goodwill,** which is an intangible asset that is created in corporate **mergers and acquisitions**. Understanding *Goodwill* and M&A accounting is important for any career in banking, law, accounting, valuation/appraisal, and private equity. In this introductory class, we will just learn the **conceptual bare bones**. But even that will take some effort.

Let's set up the problem in the framework of the discussion we've been having recently. In general, in this class, we've talked about how and why the **'true value'** of the

corporation (or, more concretely, its **'market value'**) will differ from its accounting or **'book value.'** Those values are different, everyone knows they are, and that's okay. But in a corporate acquisition, the two different values collide, and this creates a challenging accounting problem. Here's a very simple definition and model an acquisition:

Acquisition: In an acquisition, Company A (with 'A' standing for 'acquirer') pays a purchase price, \$PP, to buy the entire target corporation, Company T, from T's now-former shareholders, and assumes all of its assets and liabilities.

So, in accounting terms, **A disburses Cash to T's now-former Shareholders** and, in return, **gets all of T's assets and liabilities**. This poses an accounting problem: All of Company T's assets and liabilities now need to be on Company A's books. If we simply moved all of those assets and liabilities over, without doing anything else, the **net debit** to A's books would be Company T's book value of Shareholders' Equity ($E_T = A_T - L_T$). But, the Acquirer just paid the purchase price, **\$PP**, in cash—a **credit** of \$PP.[2] So, if the negotiated purchase price (\$PP) does not precisely equal the book value of the erstwhile Target (E_T), which it never will, we have an accounting problem.

How does accounting deal with this? In two steps:

- **First**, for this special situation, the acquirer gets to **write the target's *identifiable* assets and liabilities *up*** to their **estimated fair value**.
  - 'Identifiable' means pretty much what you would expect: Assets that can be separately 'identified.' So, the assets that the target has recorded on its books (e.g., Equipment, etc.) would definitely count, and so would the target's *internally developed patents and trademarks* (which previously would not have been recognized on the target's books). However, the benefit of positive Tweets from customers is, while a real source of economic value, not really separably 'identifiable'—so that would not count.
  - We call the difference **Net Identifiable Assets** (NIA).
    - $NIA = Net\ Fair\ Value\ of\ Target's\ Identifiable\ Assets\ and\ Liabilities$
- **Second**, we *plug* the *difference* between the **purchase price** (\$PP) and the **Net Identifiable Assets** with **'Goodwill (A)'**.

In accounting, 'Goodwill' is an **intangible asset** account that only arises in acquisitions, and is a 'plug' that spans the gap between the price the target was purchased for and the net fair value of the target's identifiable assets and liabilities. As such, it represents **everything and anything** that can explain the **difference** between the **identifiable accounting** (net) assets of the Target and the **'real'** value that the Acquirer saw

[2] Companies can also pay for acquisitions using their own stock (either partially or entirely). I'm assuming cash for now to keep thing simple. The basic concept is the same in stock-financed acquisitions.

and paid for. The term 'Goodwill' seems to *connote* things like customer and employee loyalty. And these would be implicitly included in Goodwill in an acquisition. But the technical accounting definition encompasses much more as well. For example, the value from positive social-media buzz about the Target's products would be *implicitly* baked into Goodwill—because that is real value, but would not be considered an identifiable accounting asset.

12.4.1 Acquisition example

Suppose our company acquires a very simple Target, paying **$10m in cash** to its now-former shareholders. Suppose the Target has the following identifiable assets and liabilities, and our valuation experts have provided the following estimated fair values:

Target's Prior Book Assets & Liabilities and Estimated Fair Values

Account	Prior Book Value ($)	Estimated Fair Value ($)
Patents	$1m	$8m
Notes Payable	$2m	$2m

Then the Net Identifiable Assets would be...:

$$Net\ Identifiable\ Assets = \$8m - \$2m = \$6m$$

And the Goodwill would be:

$$Goodwill = Purchase\ Price - Net\ Identifiable\ Assets = \$10m - \$6m = \$4m$$

And the journal entry for the acquisition would be:

Patents (+A):	$8m	
Goodwill (+A):	$4m	
Cash (-A):		$10m
Notes Payable (+L):		$2m

Acquiring Simple Target, July 4, 2021

12.4.2 Goodwill discussion

There is *a lot* to talk about and debate with Goodwill. First, what *is* Goodwill? It's hard to say. It *is what it is.* A necessary plug for this special situation, representing *anything and everything* that accounts for the *difference* between what an acquirer is willing to pay, and the estimated fair value of the assets and liabilities that are considered 'identifiable' by the accounting system. So, we know we need to account for it, but we can't

say what's really 'in' that account—so many different things are 'in' it. And yet, Goodwill is large. It accounts for about **10%** of the **total assets** of large U.S. publicly-traded companies over the past two years.[3] Yes, 10% of large-company assets are this **vague 'plug'** or 'catch-all' account. Many accounting professors and standard-setters see this as problematic.

Finally, I want to add some clarifying notes to **anticipate confusion**, for students who read the business press or have had business or finance internships. You may have heard that during an acquisition, if the acquirer is purchasing a publicly-traded target company, the acquirer will have to pay a **"market premium"** to the pre-deal stock market price of the target. And this should seem logical: If the target's current stock price were greater than what it was being offered by the acquirer, why would it accept that offer? You may have also heard talk of **"synergy"** in acquisitions—a term for the idea that the Target will be worth more as a part of the Acquirer than it was worth on a standalone basis (i.e., Value (A&T together) > (Value A + Value T)), which provides the logical basis for the acquirer's willingness to pay that premium.

These facts and concepts are somewhat **related** to Goodwill accounting, but also **distinct and technically separate**. Some students are tempted to think that the Goodwill the acquirer will recognize is equal to market premium it pays. But this is **not correct**. The two are related in that, all else equal, the more the acquirer pays, the higher the market premium and the higher the Goodwill. But they would not be the same number unless the net fair value of the Target's identifiable Assets and Liabilities exactly equaled the Target's pre-deal standalone market price—which it never will. So, if you know a little about M&A and know about market premiums and synergies, just don't get distracted by them and forget the precise **accounting definition** of Goodwill.

12.5 What does accounting "really *mean*," given this?

This might seem like an abstract or philosophical question. But this will arguably be one of the most practical, important takeaways for your careers. For example, many finance careers are about using financial statement numbers to understand and estimate the 'true' financial value of a company; and many general business careers are about using them to understand and measure how well companies have performed, or could perform. But these professionals are under no illusion that the **GAAP** value of Shareholders' Equity tells you that **directly**. In other words, financial professionals and other businesspeople are constantly *implicitly* thinking about the relationship between *accounting value* and *'true' value*, i.e., the "meaning" of financial-statement numbers.

[3] Author calculation from Compustat annual, with 'large' defined as total assets above the Compustat sample median.

In the first chapter of the book, we talked about "two ways to see The Accounting Equation," two intuitions for thinking about what it tells you. One of these two views was the "what's left over view" ($E = A - L$). But, then shortly after, we admitted that this intuition was not quite correct, because "accounting value" is not the same thing as "true market value," nor does it intend to be. The other view of The Accounting Equation was the "sources of financing view" ($L + E = A$), that it tells you how much the company's resources (assets) **cost** and **who financed that (***L and E*).

But now, the introduction of these **fair-value accounting issues** complicates *that view* as well. Now, sometimes assets *are* measured at the best estimate of their 'true' fundamental or market value, **rather than their historical cost (purchase price)**. *But*, complicating things still further, due to accounting *conservatism* this is usually only on the downside, **asymmetrically**. *Except* in the case of acquisitions. After acquisitions, all of the target's identifiable assets are written at their estimated fair value, as of the acquisition date—and the remainder of the purchase price is allocated to an intangible plug account (Goodwill). And, given the **core linkages** in accounting, all of these complexities in **asset measurement** pass through the **Income Statement** as well. (Is your head spinning now?)

So, what does $1 of book equity or net income really *mean* or *represent*? Sometimes, assets are at historical cost, sometimes they are at fair value—but that is usually only on the downside. Sometimes, we 'smooth' earnings out by, e.g., allocating an investment as *Depreciation Expenses* over time. Sometimes, we 'pull' all the bad news about the future into this one reporting period, as in the *writedown* of *Inventory* or the *impairment* of another asset. Clearly, in accounting, the **'bottom line'** does not mean one thing—it's a **composite**, a **mix**, a **mashup**, of several different things. So, what is accounting? Can we say anything firmly beyond, "these measures are **the output of the rules**" (which have an inconsistent and asymmetric relationship with both true value and historical cost)?

And yet, somehow, everyone in the business and financial worlds seems to find these numbers useful. Why? Because, these professionals understand accounting, which means they are under no illusions that each and every $1 of book equity or net income represents $1 of value for shareholders. They **know the distortions and contradictions of accounting, which means that they know how to unravel them**.

Thought Experiment: Suppose that accounting measurements of assets and liabilities were **biased**, such that the 'true value' of every asset and liability was **exactly twice** its accounting value, and this were known. In that case, investors could directly infer the 'true value' of every single asset and liability (and thus the residual value of the equity), with simple arithmetic: Divide by two. This is obviously not a realistic example. But it illustrates that the **usefulness** or **"informativeness"** of accounting is not the

same thing as the 'meaning' or 'unbiasedness' of particular bottom-line measures, because **savvy analysts can make their own adjustments and do their own analyses**. This course is largely about equipping you with those tools. Accounting is a **map**, and the **map is not the territory.** But, if you know how to read maps, you can use them to navigate.

12.6 Contemporary issues: Discussion Questions

12.6.1 Fair-value accounting is a 'live' and controversial area

The use of *fair value* estimates is one of the most significant and fast-changing issues in accounting. This chapter of this intro course has only scratched the surface. And fair-value accounting standards will likely change over the first years of your career. So, rather than go into ever more details about where fair-value is used, just think. Where do you think it *should be* used, and why?

Suppose that our company has invested in the stock of another company. If we continue to hold that stock, but the stock price gyrates, with news about actions from the Federal Reserve, the coronavirus pandemic, and vaccine distributions, should we recognize 'Gains' and 'Losses' on a quarterly basis? If not, why not? Or, would your answer change depending on whether our company was in the financial sector, vs. otherwise?

Or, suppose that our company has an office in Culver City, in a building that we have owned for the last 20 years. Should we write that real estate (*Property*) up to its current estimated fair value, and book profit? If so, how frequently? What if our office were in a less well-populated area, where it would be harder to get a reliable current appraisal of the value of commercial real estate? What do you think?

13

Intro to Finance

Our next *accounting deliverable*, in the next chapter, is accounting for **corporate bonds**. Bonds are the major way in which large, mature companies *finance themselves*—that is, get the cash they need to make investments.

A bond is essentially like a *Loan*, but is just traded in a *financial market* (like a stock) instead of directly, bilaterally contracted with one bank. When a company **'issues a bond,'** it **sells a contract**: It **promises** to make a fixed schedule of **interest and principal** payments in the future. And in exchange for this promise, **bond buyers**—such as mutual **funds, banks, corporate pension plans**, insurance companies, and even individual **savers**—give the company **cash today.**

It turns out that the ***Interest expense*** that companies recognize on their bonds will be **determined** by this **financial market**. So, to understand the accounting for bonds, we need to understand the basics of **finance**. Since most students in this class have not yet done an introductory finance class, we cover those basics now.

Finance is the theory of **value, risk,** and **time**—that is, it is about the question of **'How much are uncertain (that is, risky) future cash flows worth today, and why?'** As we will see, this is **equivalent** to asking, **'How much can we expect to get in the future, in return for investing some of our cash today?'** Put differently, finance is just about the relationship between cash/value *today*, and expected *future* cash/value. The theory is **elegant and deep.** It's challenging at first, but, once you internalize it, you'll see that everything you need to do boils down to just **one formula**.

13.1 Bonds, loans, and installments are just Cash Flows

A **bond** is essentially the same as a **loan**——both are forms of **credit**, in which the corporation receiving the credit promises to pay a **fixed stream** of **interest and principal** payments. The major distinction that is conventionally made between bonds and loans is that **loans** are **directly** negotiated with and provided by **one bank** (so interest and principal is paid directly to that bank); while **bonds** are sold to and traded in the **financial markets** more broadly (so, interest and principal is paid to whoever **purchased that bond contract in the financial market**).[1]

By now in this class, we've seen a lot of simple examples of accounting for loans, so I think that we know the basic form. Just as with loans, for normal bonds, the interest and principal payments are defined by the **face value**, the **maturity date**, the **stated interest rate** (or 'coupon rate'), and the **frequency of interest payments**. You should be able to write down the payments based on those terms. For example, consider a bond with a face value of **$10,000**, a stated **6%** coupon rate, with interest paid **annually**, and maturing in **5 years**. Tabulating that, this means that this bond promises the following sequence of payments:

Time	**+1 Year**	**+2 Years**	**+3 Years**	**+4 Years**	**+5 Years**
Interest Paid	$600	$600	$600	$600	$600
Principal Paid					$10,000

Contract we call 'loan or bond'

Now, back up. This is **not the only form of credit financing**. Another thing that both you and a corporation can do is to finance the purchase of a good by promising to make a series of future **installment payments**. For example, suppose that the corporation (or you) gets **$10,000 in cash** (or a car worth $10,000) today, and you promise to pay **5 annual installment payments** of **$2,400** in return. Then, tabulating, the future promised, fixed cash flows would look like this:

Time	**+1 Year**	**+2 Years**	**+3 Years**	**+4 Years**	**+5 Years**
Install Payment	$2,400	$2,400	$2,400	$2,400	$2,400

Contract we call 'installment payment'

There are two important things to note here, comparing the two tables above. **First**, while we call these contracts different **names** ('loan' vs. 'installment payment'), and

[1] As usual, the reality in the 21st century is a bit fuzzier and more complex than this stylized simplification. In principle, there's nothing stopping banks from selling the loans they have extended to other parties, i.e., 'the market.' And the market for corporate bonds is in fact famously **illiquid**—there is very little trading, relative to the market for corporate stocks.

have different **words** for the *types* of payments (installment vs. interest / principle), they have the **same basic form**. In both cases, you **get something today**, and in return, **promise** to make a set schedule of **future payments**. The only difference is the precise **amounts due on each date.**

And, indeed, this is the view that the field of **finance** takes. From the perspective of finance, there's just an exchange of **cash today, for promised future cash,** and the **names don't matter**. So, finance just uses the general term **'cash flow.'** These contracts are all just specified **cash flows**, in and out. So, we can represent the two tables in a more simple and general way, like this:

Time	**+1 Year**	**+2 Years**	**+3 Years**	**+4 Years**	**+5 Years**
Cash flow promised	$600	$600	$600	$600	$10,600

Contract we call a 'loan' or 'bond'

Time	**+1 Year**	**+2 Years**	**+3 Years**	**+4 Years**	**+5 Years**
Cash flow promised	$2,400	$2,400	$2,400	$2,400	$2,400

Contract we call 'installment payment'

The **second** important thing to notice is that, in the installment payment contract, there is an **implicit cost of the financing**. The **total installment payments** add up to $12,000. By now, we know that loans and bonds entail interest payment—and, conceptually, interest is the cost of the loan for the creditor, the extra amount they have to pay in order to get cash financing today. What we learn here is that there is an **implicit cost** of borrowing in that **installment payment**, even though nothing there is **named** 'interest' vs. principal. Soon, we'll find out that the installment payments *does have* an implicit, true interest rate, and we'll learn how to calculate it.

13.2 Linking present and future value: 'discount rates'

So, now we understand that all forms of credit financing are, despite their **different names**, really just one thing: **Cash flows, in and out.** Next, we need to back up to some deep, high-level theory. The field of finance has a systematic, elegant, deep framework for understanding the link between **cash today** and **future promised cash.**

In finance, the **future value** of any asset is linked to the **present value (PV)** by what we call the **'discount rate'**—that is, how much you **'discount'** a promised future payment in terms of your **willingness to pay for it today**. We 'discount' the cash flows that are promised by financial assets—that is, we **do not value them 1-for-1** in present-value terms—because we usually **do not like delay or risk**. That's the **core idea of fi-**

nance. Almost **every formula** you will ever see in finance is just a way of re-expressing this idea in a mathematical form. **I am dead serious**. If you understand that idea, stated verbally, you can absolutely master finance.

Now, let's write the idea we stated in **words**, above, in the form of an **equation**:

$$Present\ Value\ of\ future\ cash\ flow = \frac{Promised\ future\ cash\ flow\ amount}{Discount\ rate}$$

Some textbooks present this as a *formula* that allows you to *calculate* things. But I think **it's important to understand that this is a mathematical identity**—we are just writing, in equation form, what we **meant** by **'present value' and 'discount rate.'**

'Discount rate' is a very *general* term in finance, and applies to all assets, including stocks, and so it is worth getting comfortable with it. But, as we'll see below, when we are talking **specifically about forms of credit**, we'll use the more familiar and **specific term 'interest rate.'** It's a **rectangle-square** situation: All interest rates are discount rates, but not all discount rates are interest rates.

13.3 What determines discount rates?

So, **what determines** 'discount rates' that we—and thus, in aggregate, **'the market'**—apply to risky future cash flows? Simply put, people do, according to their own **beliefs and preferences**. Discount rates are not handed down by **law or from Mt. Olympus**. They are a function of people's choices, **beliefs, preferences, and constraints** as expressed in a **financial marketplace**—just like the **price of jeans** in a **retail market.**

Consider a **toy example.** Suppose that you have a friend named Taylor, who **promises** to pay you **$1,000 in one year**, if you front them some **cash today**. How much is that promise worth to you? Taylor's promise is **not a sure thing**, and even if Taylor *does* deliver on the promise, that cash will be delivered **in the future.** So, that promise **shouldn't** be worth a full $1,000. That is, it should be *discounted* relative to that. But, by **how much**? That's up to you.

Suppose that, after considering everything, including what you know about Taylor's future earnings potential, you determine that the maximum amount that you would be willing to give Taylor today in exchange for that promise is **$800**. So, restating that **verbally**, that means that in valuing Taylor's promise in *present value* terms, you 'discounted' $1,000 down to $800. We can write this idea in **math** as:

$$Present\ value\ of\ Taylor's\ promise = \$800 = \frac{\$1,000}{Discount\ rate}$$

Now, we have only **one free variable** in the equation on the right side, above, and

so we can mathematically **solve for the discount rate**, which previously we only discussed at a conceptual level. Rearranging terms, this implies that your discount rate for Taylor's promise is $\$1,000/\$800 = 1.25$. That is:

$$\$800 = \frac{\$1,000}{Discount\ rate}$$

$$Discount\ Rate = \frac{\$1,000}{\$800} = 1.25$$

Now suppose that your friend **Matt** promises to pay you $1,000 in one year's time. But Matt is known to be a **volatile and shifty** figure. You suspect he might lose his job next year, due to his repeated failure to balance his debits and his credits. So **you don't trust Matt to pay you back** as much as you trusted Taylor. So, put simply, **Matt's promise is not worth as much** to you as Taylor's.

So, after factoring in all considerations, suppose you decide that the maximum you are willing to pay for Matt's promise is $600. Restating that in arithmetic:

$$Present\ value\ (PV)\ of\ Matt's\ promise = \$600 = \frac{\$1,000}{Discount\ rate}$$

Once again, we have only one free variable, so we can solve for the discount rate you are applying to Matt's promise: In this case, it is $1.67 = \$1,000/\$600$.

So, from this very simple pair of examples, we can extract a **deep insight** that is at the **core of finance**, and that will hold true generally: The **riskier an asset** is (the more uncertain its promised future cash flows), the **lower its present value (PV)**, and, thus, the **higher its discount rate**.

How exactly do you **define and estimate 'risk'**? Isn't this 'risk' inherently about the **future**, which we cannot observe, and thus inevitably somewhat **subjective and uncertain**? Great question. And, yes. These gnarly issues are the **subject of finance** classes. We can't go into too much depth here, about the particular *methods* for defining and estimating risk. For now, don't overthink it: **All we need to know, for now, is that some companies are riskier than others, and thus there is variation in the discount rate** that market participants will apply to them. Clearly, lending to a company that is on the verge of bankruptcy is riskier than lending to one that is not.

13.4 Discount rate and interest rates

The great thing about accounting and finance (as opposed to, say, math) is that you have both some quite **deep theory**, but you also have **real-world** institutional practices that have **evolved for thousands of years**, and the two converge (and sometimes clash) in subtle ways. 'Discount rates' are the general, theoretical idea, and that term

is applied to *all assets* (including stocks, which you will see in depth in your finance classes going forward). But, when we are speaking of **forms of credit**, it is more conventional in practice to use the term **'interest rate.'**

And, further, you may know that annual interest rates are typically quoted in **percentage terms**—numbers like 6% to 25%, rather than numbers like the 1.25, above. So, in teaching finance, when we are talking about credit financing, we **compromise with real-world conventions**, and use the expression **'(1 + i),'** with the **'i'** standing for '**interest rate,'** in the denominator of the identity above. It's the **same concept and theory**, just a new way of **writing it**. So, rewriting the above, we now have:

$$PV\ of\ Taylor's\ promise = \$800 = \frac{\$1,000}{Discount\ Rate} = \frac{\$1,000}{1+i} \rightarrow i = .25 = 25\%$$

This implies that i = .25 = 25%. So now, bringing this together, **we can say something that sounds a bit more conventional: 'The annual interest rate you charge to Taylor, based off of your assessment of Taylor's credit and ability to repay, is 25%.'** (Similarly, the *i* for Matt's promise is .67—so you are charging an annual interest rate of 67% to Matt.)

So, the **big takeaways** from what we just learned are as follows:

1. In financial markets, people trade **cash today** for promises of **future cash** flows.
2. People generally don't value those future promises of cash 1-to-1. They **discount** them, because we generally **do not like** risk or delay.
3. The **degree** to which you discount them (i.e. the discount rate) is primarily determined by the perceived **risk**.
4. When we are talking about forms of **credit** financing—as we are in this section of this course—we re-express 'discount rate' as the **'interest rate.'**
5. That interest rate is the **i** in the formulas above.[2]

13.4.1 Present values and future values: it goes both ways

The equation we started with is an **identity**—it is **true** by the nature of **what the terms mean**. And there are **three terms** in it: **present value, future value,** and the **interest/discount rate**. So, this means that we can do **other calculations** as well—if we know any **two** of those variables, we can **solve for the third**. Above, we had:

[2] And generally that interest rate should be somewhere in the order of 1% to 40%, depending on the company and situation. (If you solve for an **i** of 130%, outside of extreme circumstances, that's probably a calculation error.)

$$Present\ Value = \frac{Future\ Value\ (cash)}{(1+i)}$$

But, trivially, we can rewrite this as:

$$\rightarrow\ Future\ Value\ (cash) = Present\ Value \times (1+i)$$

So, as a concrete example, if we are told that somebody is paying **$100** to invest in a bond that will pay interest and principal in one year, and we are told that the interest rate is **15%**, then we know that the expected future cash payment of that bond is **$115** in total (principal and interest both included), since $\$100 * (1+.15) = \$115$.

And we can also rearrange terms and solve for i, which is basically where we started:

$$\rightarrow\ i = \frac{Future\ Value\ (cash)}{Present\ Value} - 1$$

13.4.2 Valuing a stream of future cash flows:

There's only one more thing that we need to do: Understand how this relationship works when we have a **stream or sequence of several of future cash payments**, not just one lump-sum payment in one year. Let's go back to the example we used at the start of this note, of an **installment payment**. The borrower in this relationship gets cash (or a car) today, and, in return, promises to make annual payments of $2,400 for the next 5 years. We represented this as:

Time	**+1 Year**	**+2 Years**	**+3 Years**	**+4 Years**	**+5 Years**
Cash flow promised	$2,400	$2,400	$2,400	$2,400	$2,400

Installment Payment Contract

How much is this whole **future stream worth, in present value**? Let's **start with what we do know**. The **first** installment payment is due in one year, **just like** in the examples **above**. So let's just talk about that **first payment alone** for now.

$$Present\ value\ of\ the\ first\ cash\ payment = \frac{\$2,400}{1+i}$$

Suppose that, based on our assessment of the credit of this borrower, we decide to apply a **12% annual interest rate** to this promise. Then, that becomes:

$$Present\ value\ of\ the\ first\ cash\ payment = \frac{\$2,400}{1+.12} = \frac{\$2,400}{1.12} \approx \$2,142.86$$

Okay, now, what to do with the **remaining cash payments**—the second, third,

fourth, and fifth? Here, we make a **simplifying assumption** (in almost any practical finance setting and almost **every class below the graduate level**). We assume that we apply the **same discounting/interest rate *per each time period***. Or, in other words, to value the **second cash payment** in present value terms, you apply the same discount/interest rate you used for the first cash payment **twice**:

$$\textit{Present value of the second cash payment} = \frac{\frac{\$2{,}400}{1.12}}{1.12} = \frac{\$2{,}400}{1.12^2} \approx \$1{,}913.27$$

There is *some intuition* for this: You'll have to **wait** for the second cash payment for **twice as long**, and the borrower will be **exposed to the same risks** (that will possibly prevent them from paying you) for twice as long. So that's an intuition. (But admittedly, this logic is not totally **rock solid**—and if you do a graduate-level program in finance, you might consider *time-varying discount rates*. In any case, this is how it's always done in this class, and almost always in practice.)

Generalizing that, we would **apply that discounting** a **third time** to the **third payment**:

$$\textit{Present value of the third cash payment} = \frac{\$2{,}400}{1.12^3} \approx \$1{,}708.27$$

And finally, the present value (PV) of the whole **stream** of future cash payments is just the **sum** of the present values of the **individual** cash payments. This means that:

$$\textit{PV of instllmnt pymnts} = \frac{\$2{,}400}{1.12} + \frac{\$2{,}400}{1.12^2} + \frac{\$2{,}400}{1.12^3} + \frac{\$2{,}400}{1.12^4} + \frac{\$2{,}400}{1.12^5} \approx \$8{,}651$$

So, that's the answer. The arithmetic looks sort of ugly at first. But, it really is **really, really simple.** We're just saying that people don't like risk or delay, so they discount future risky cash flows, and as the time horizon increases, the **'discount' multiplies in turn.** The above is just putting numbers to that idea.

13.5 Doing the same for the bond

Now, let's **apply** what we've learned to the **simple bond** we used as our starting example, above: That bond had a 5-year maturity, and paid annual interest payments, with a stated coupon rate of 6% and face value/principal of $10,000. And, as we learned, despite the different names, these are all just **cash flows**. So, we can represent this bond like so:

Time	**+1 Year**	**+2 Years**	**+3 Years**	**+4 Years**	**+5 Years**
Cash flow	\$600	\$600	\$600	\$600	\$10,600

Now, in even doing this calculation, we're already encountering something new and **seemingly paradoxical**. We already said that this bond has a **'stated' interest rate**—called the **'coupon rate'**—of 6% annually. But now, we are **not** taking it for granted that this is the **'real'/ 'true'/ or 'market' interest rate**. The bond's **stated coupon rate** is just **text in a contract**—it's the way of specifying the **size** of the **cash interest payments** relative to the **face value**. The company issuing the bond **can't force us**—that is, 'the market'—to accept that 6% stated interest rate as the 'true' discount rate. We—or, more generally, the financial marketplace—**get to decide** how much we're **willing to pay** for that bond.

How do we do that? The amount that we'll pay is, **by definition, the present value.** We **already specified the promised future cash flows**. So, to calculate the present value, we need to decide on our discount/interest rate. Suppose we determine that, based off of this company's riskiness, we require an **8%** interest rate. Then, the present value will be: [3]

$$PV\ of\ bond = \frac{\$600}{1.08} + \frac{\$600}{1.08^2} + \frac{\$600}{1.08^3} + \frac{\$600}{1.08^4} + \frac{\$10,600}{1.08^5} \approx \$9,201.46$$

[4]

13.6 Generalizing: *The* identity of finance

Let's back up and restate what we've learned in a more general form. This will be useful for two reasons:

- The general theory is very important, for this class, and any business career.
- As we'll see below, some calculations we'll do when we apply this theory will *look* very big and unwieldy and force us to use Excel. As a result, if you just jump into those calculations, you might get the impression there are a lot of new hard

[3] If it helps, you can paste this formula into Google to verify the calculation: $(600/1.08) + (600/1.08^2) + (600/1.08^3) + (600/1.08^4) + (10600/1.08^5)$.

[4] Notice how because our **actual interest rate is higher** than the bond's **stated** coupon rate, the present value of the bond—and thus, the cash we would actually pay to the corporation issuing this bond—is **lower than its face value**. This will hold generally: If the 'real'/ 'true' market interest rate on a bond is higher (vs. lower) than its stated or 'coupon' rate, then its present value and price upon its issuance will be lower (vs. higher) than the face value. And, if the market interest rate is exactly equal to the stated coupon rate, the present value and issuance price will be the same as the face value. This is *not* a coincidence, but the proof of this fact takes up a bit too much space. To 'prove' it to yourself, you can just paste calculations like this into Google: $600/1.06 + 600/1.06^2 + 600/1.06^3 + 10,600/1.06^4$.

formulas and ideas to master. But there aren't. There's just **one idea**, but a bunch of Excel shortcuts for calculation. So, mastering *the idea* will spare you anxiety.

What we've learned so far is that the **present value** of any asset is, **by definition**, equal to the **future cash flows it promises, discounted** by some discount/interest rate. Assuming, as we do, a **constant interest rate** per time period, this means that the following is always true:

$$Present\ Value = \frac{[Cash\ flow_1]}{1+i} + \frac{[Cash\ flow_2]}{(1+i)^2} + \frac{[Cash\ flow_3]}{(1+i)^3} + ... + \frac{[Cash\ flow_n]}{(1+i)^n}$$

Or, we can put this in **even more general terms** as...:

$$Present\ Value = \sum_{t=1}^{\infty} \frac{Cashflow_t}{(1+i)^t}$$

Present value is the **sum of all future cash flows, ad infinitum, discounted by the discount rate** / interest rate, in the way we've been doing. This will be true of every asset, every present value calculation, every market interest rate calculation, etc.—**always and everywhere**. Every finance **calculation** is just a re-expression or shortcut of this **one idea**, this **one identity.**

13.7 Reversing: solving for the discount/interest rate

Everything we did above was **correct**, but also a bit *backwards*. Usually, *in reality*, we are not *given* a discount rate by a professor. Instead, usually we can directly **observe the stated terms of the debt contract** (that is, the future cash payments promised), and we can directly observe a **market price for the bond**—that is, how much people are actually paying for it in the market. The **'real'/market interest rate is not written down** and directly observable in the same way. And so a more realistic calculation in the real world would be to use a bond's market price (that is, its present value in the market) and its future payments to **calculate its actual interest rate.**

Suppose that we observe that the same bond we specified above ($10k face value, 6% coupon rate paid annually, maturing in 5 years) was issued to the market and traded at a price of $9,500. Then, putting this in math terms, this implies that:

$$Market\ PV\ of\ bond = \$9,500 = \frac{\$600}{1+i} + \frac{\$600}{(1+i)^2} + \frac{\$600}{(1+i)^3} + \frac{\$600}{(1+i)^4} + \frac{\$10,600}{(1+i)^5}$$

There is only one free variable in this equation—i, the interest rate. So, there **is a solution** here, an **implicit market interest rate**. But, even for this simple 5-year bond, the solution involves a **polynomial of order five**—I may be rusty on my high-school

algebra, but I don't remember how to solve this by hand. So, here, we would **just rely on** a financial calculator or **Excel shortcut** to solve this for us.

Or, suppose that our bond instead had a 20-year maturity. In this case, the formula for calculating its present value would be:

$$PV = \frac{\$600}{1+i} + \frac{\$600}{(1+i)^2} + \frac{\$600}{(1+i)^3} \ldots + \frac{\$600}{(1+i)^{19}} + \frac{\$10,600}{(1+i)^{20}}$$

The concept is still very simple. It's still that **one core identity of finance**. But this is now a very **long calculation**—involving twenty terms, and polynomials of order 20—and we would likely make errors if we tried to add up all those terms on a scientific calculator. So, even though the concept is really simple, the calculation gets gnarly, and so it's best to save some time and trouble and use Excel. **Online resources** can walk you through how to use these **Excel shortcuts**. I won't add value by repeating them here.

13.8 Net present value (NPV)

An extremely important concept in finance, business, and econ—a term that you will hear ubiquitously in future finance classes and your careers—is **'Net Present Value' (NPV)**. What is it? We've just discussed **present value** at length. *Net* Present Value is just... (drumroll)... the *net* present value. It is the **present value of the benefits/payoffs (cash inflows)** you get from some asset or investments, **net of** the **present value of the costs (cash outflows).**

If you've followed this chapter so far, you can see that this is ***the metric for rational investment decisions***. Present Value is just, by definition, how much future risky cash flows are worth to us in present-value terms.

13.8.1 NPV examples

In most investments, you have to **pay out something now** in order to get the future benefits. So, even if those future benefits are large, that investment might be a bad idea, if the **price you have to pay today is too high**. To determine whether an investment is worth it, you need to decide whether the benefits you expect to get in the future are worth what you have to pay out today to get them. That is, you need to decide whether the present value of the benefits is greater than the present value of the cost. That is, you need to know whether the *Net* Present Value is positive.

Recall the example of the **installment payment contract**, where we were promised 5 annual payments of $2,400 each. When we applied an interest rate of 12% to that asset, its present value was:

$$PV\ of\ instllmnt\ pymnts = \frac{\$2,400}{1.12} + \frac{\$2,400}{1.12^2} + \frac{\$2,400}{1.12^3} + \frac{\$2,400}{1.12^4} + \frac{\$2,400}{1.12^5} \approx \$8,651.46$$

Now, suppose that we were considering buying this asset, the entitlement to **receive those future cash flows**. Suppose that the price to buy this asset was $8,000 (or, put differently, we would need to loan someone $8k to get this installment contract). How would we factor that price in?

In finance terms, purchasing this asset would just be a **negative cash flow of $8,000 today**. What's the appropriate **discount/interest rate on that cash outflow**? **Nada.** Go back to our core theory. The cash purchase would be a **sure thing, paid today**, so it would **not be discounted.** There's no interest on an immediate, certain payment. So, the **Net Present Value (NPV)** of this investment opportunity would be:

$$NPV = -\$8,000 + \frac{\$2,400}{1.12} + \frac{\$2,400}{1.12^2} + \frac{\$2,400}{1.12^3} + \frac{\$2,400}{1.12^4} + \frac{\$2,400}{1.12^5} \approx \$651.46$$

(Of course, you could shortcut to this answer by subtracting the purchase price from the present value of the future payments, which we had already calculated above.)

Based on this analysis, this is a **good deal**. You *should* be willing to buy this installment contract, at that price. Why? Because, the price of buying it is *lower* than the *present value of the benefits*. If we claim that the *present value of the benefits* is higher than the cost, but we *don't* want to make that trade, we're **contradicting** ourselves. So, **calculating NPV** is really just a matter of **expressing our beliefs and preferences formally**.

Now, suppose that the price of this asset were instead $9,000. In that case, the NPV of this opportunity would be -$9,000 + $8,651.46 = -$348.54. In other words, the net present value would be negative, because the value of what you have to pay is **greater** than the present value of what you would receive.[5]

13.8.2 Present Value Discussion

Fair-value definitions: Now, that we've covered the **technical aspects**, there are a lot of important high-level things we can understand. Looping back to **Chapter 10**, this is the ultimate explanation for **why the two definitions of 'fair value' ultimately converge**. Recall that the first definition was 'What an asset would sell for in a competitive market.' And the second was the definition of present value, 'The discounted value of expected future cash flows.' If those two numbers are **not pretty close to each**

[5]Note that this is true even though the total promised cash flow from this investment is $12,000—meaning that the expected **net cash flow** (undiscounted) is actually +$3,000 in this scenario.

other, there is "money on the table." That is, if the price is lower (vs. higher) than the present value of the benefits, it would be *NPV-positive* (vs. NPV-negative) to buy it at that price. So, in **economic equilibrium**, the two numbers should be the same.

Contemporary discourse: It's common, in everyday speech, the media, and the public discourse, for people to claim that, e.g., "Companies are focusing on short-term value, at the expense of their long-term value." But, based on what we've learned so far, this is a **fallacy**, or, at the very least, a **misnomer** (misuse of the terms). As we've learned **'present value'** *already is* a long-term calculation. The translation of *all of the future* benefits into present-dollar terms. So, 'short-term and long-term value,' is a bit of a misnomer, based on what we've learned so far.[6] There can be a tradeoff between **short-term (e.g., this period's)** ***profits*** and overall **present value**. Those things are different. But **value**, by definition, is already a long-term calculation.

Relevance: Why is **Net Present Value** such a **ubiquitous concept** in finance and business? If you followed the logic above, you can see that this is ***the*** **metric** for rational investment decisions. It is a formal way of calculating whether an **investment is worth it**—whether the expected future benefits, translated into present-value terms, are worth the costs—and that is what **managers have to decide** on every day. In **Econ 101**, it is traditional to teach students that companies **'maximize profits.'** But the truth is not quite so simple. In reality, companies are willing to **forego profits today** in order to earn **more profits in the future** (by investing in things like internal R&D, or growing their market share by selling at very low prices, etc.) This has become an extremely common, prominent strategy among many **tech firms**, especially 'platforms,' such as Amazon, Uber, etc., which spent many years **selling at below cost** (and reporting negative profits) in order to **grow their market share**. The reason they do this is that they were motivated to maximize not just this reporting period's profit, but their total *value* for their shareholders. Shareholders care about the total net present **value** of their shares—their wealth—not just one period's reported profits. So, the concept of NPV is ultimately essential to understanding the business strategy and choices of the most prominent companies in the world today.

[6] As always, things can get ever-more complicated in reality and in graduate programs. For example, if there is *information asymmetry* between firms and the financial market, managers could make some corporate policy choices—or deceptive disclosures—that could increase the stock price in the short-term, while hurting the 'true' fundamental present value. For now, the point is to internalize the meaning of *present value*, which, by definition, already incorporates expectations for the future.

13.9 Other finance topics

13.9.1 Risk and return

While we're on the topic of finance, I want to talk about another idea that comes up a lot, which we now have the tools to understand. You may have heard phrases of the form like **'high risk, high return.'** I think that many people think that this is a kind of moralistic exhortation, indicating that companies need to make big, *bold* risky moves in order to *generate* high profits. But in the context of finance, that is *not what this really means*. Instead, the real meaning is something we've already discovered in the first pages of this chapter, and is, frankly, more **boring**.

What the phrase **'high risk, high return'** really means is this: **Mechanically**, when investors are **worried** about the risk of some creditor, they are **not willing to pay as much** today (that is, in present value) for the promised future payments. So, the **higher the risk** of some investment, the **lower the present value** relative to the expected future value. And the return on a financial investment is, by definition, the future value you get from an asset, divided by what you paid for it. Restating in equation form:

$$Present\ Value = \frac{Expected\ Future\ Value}{Discount\ Rate}$$

$$\frac{Expected\ Future\ Value}{Present\ Value} = Expected\ Return = Discount\ Rate$$

So, **high risk means high return *because* you pay less** up front for the expected future cash flow. I.e., high risk means high return, *because* risk is *bad*—not because it is *bold*—so financial markets trade off the two.

13.9.2 'Market efficiency'

Finally, I want to discuss one last very important finance term: **market efficiency.** I think that when much of the general public hears the term 'market efficiency,' they think that heartless economists are claiming that markets are morally ideal. But this is **not** what this term means, in the **context of finance.** 'Market efficiency' simply means that, if you want to buy or sell an asset in a financial market, you'll be entering a very **competitive marketplace**, where the other people you need to buy from or sell to are pretty smart and also looking for good deals. So, you can't expect anyone to sell you a financial asset (whether a bond or stock or anything else) at a price at which it is an obvious, no-brainer, good investment—near-certain to sharply increase in value, with little risk. Why not? Consider this **'proof by contradiction'**: If it *were* certain that the asset would drastically increase in value, with little downside risk, **why would the seller sell it at that price** right now?

Generalizing this, in financial markets, the **prices** that assets trade at are set in a way that **already takes into account** the available information about the company **and its future prospects**. That is, the current prices of financial assets *already reflect* predictions about their future performance. A more ***trippy*** way of putting it is this:

> "The **current price** of an asset in a financial market ***already is***, essentially, a ***prediction*** about its future price. In a sports betting market, you might be able to predict an ***event***, e.g., that the Lakers will beat the Knicks in the next game, with some success, better than a coin flip. But you can't really predict how the **prevailing prediction itself**—that is, the betting odds—will change in the interim. Similarly, you can't predict whether a stock will outperform.[7]"

Less wordy professors thus sometimes define market efficiency as:

> **"Prices reflect all available public information."**

This notion has two practical implications for our purposes:

1. First, if an asset (such as a bond) promises a **higher** rate of **return** (which is the market interest rate in the case of a bond), that return must come with a **catch**—presumably, more **risk**. So, a higher interest rate means higher risk and vice-versa.

2. Second, given market efficiency, we will often assume that market prices and interest rates are basically **'correct.'** If we want to calculate the net present value of an investment, we'll often take for granted some relevant **market discount rate** as our 'true' discount rate for doing so. And, next chapter, we'll see that the market interest rate (rather than the company's 'stated' coupon rate on the bond) is what determines the actual ***Interest Expense*** a company will recognize in its financial statements.

[7] That is, yield returns beyond the *expected return* entailed by its risk.

14

Long-Term Liabilities

This chapter is about **accounting for bonds.** The main challenging work in this chapter is what we call **'bond amortization.'**[1] And it is among the **hardest**, most complicated, and most technical parts of this course. But, as we will see, it is a **necessary process** for accounting for some interesting and **inevitable complications** in how companies **finance themselves with bonds**. And we can reduce the accounting to a fairly **rote algorithm**. So, while this material will look tough and gnarly at first, it is absolutely doable.

14.1 What is a bond, and what is the problem?

Bonds are the major way in which **mature** companies finance themselves. They are a form of **credit**. The company makes a contractual promise to pay out a specified stream of payments—interest (or 'coupon') payments and the face value on the maturity date. They are **like loans** in that respect, but with **one major difference**: Companies **issue (that is, sell) their bonds to the financial marketplace**, where financial market participants (such as pension plans, hedge funds, or even individual investors) bid on those bonds and **trade** them. So, the interest payments are paid to whoever has bought that bond in the market. Whereas with a loan, the company negotiates and contracts privately with a **bank**, and the bank holds onto the loan instead of trading it.

[1] (This is quite distinct from the *Amortization expense* we covered in Chapter 10—the allocation of the purchase price of an *intangible asset*. Same word, quite different meaning.)

The **jargon** here is a bit confusing to first-timer learners, but important to grasp. We say that a company **'issues (or sells)** a bond,' because it is as if it is **selling a piece of paper** to the financial markets (the contract specifying the future payments it will make), in exchange for getting **cash today**. In the jargon of the financial world, bonds are often referred to as **'fixed income'**—because the payments (income) they offer to the owners of the bond are **fixed** in advance (in direct contrast to the dividend payments on *shares*).

The basic **accounting challenge** is this: The company issues its bonds to the **financial free market**. The company **cannot sell** a bond contract to the financial market **until it set the terms** of the contract. So, the company has to specify a **'face value'** of the bond (the amount that it will pay off at the end) as well as its **cash interest payments**. By definition, the **cash interest payments** are determined by the **face value and the 'stated' interest rate**. Going forward, we'll refer to the 'stated' interest rate as the '**coupon rate**,' to more clearly distinguish it from the 'true market rate.'[2]

So, in short, the company has to specify its **stated coupon rate** prior to selling the bond. But the financial market is a free market. And so, as we learned in the last chapter, the participants in that market get to **make up their own minds** about what those future promises are worth—the **present value**—which is what the market will actually pay for the bond on its issuance date. And, by the **core identity of finance**, that is equivalent to determining the **real interest rate** on that bond.[3] We could also say it this way: 'The market gets to decide the real interest rate it will assign to the company's bond, which determines the present value.' Given our core finance identities, those are **equivalent statements**.

But this creates an **accounting problem**: The **cash received** on the bond (a debit to Cash for the issuer), will **not equal the face value** that the company is obligated to pay on the maturity date. And the **stated coupon rate will not equal the market interest rate**. So, that's an **inevitable problem**. **'Bond amortization'** is accounting's way of dealing with that. But before we can get to that, we need to be clear on a few more mechanics.

14.1.1 Bond specification:

Now, let's start making this more concrete: The first step in basically any bond problem is to be able to go from a **verbal description of a bond's terms** to understand the **cash payments it promises**. The key parameters in a bond contract, for our purposes, are:

[2] This language has to do with the history of bonds. Back in ye olde days, pre-digital era, bonds were **literal paper contracts** printed and sold by corporations to investors—those investors would literally clip a coupon off of that bond on the specified interest payment dates, take that physical coupon to the bank, and redeem it for cash there.

[3] ...since $i = \frac{future\ value}{present\ value} - 1$, and related identities.

- the coupon rate,
- the maturity date,
- the face value,
- the interest payment frequency.[4]

For example, suppose we have the following **verbal description**: 'A $10,000 face value bond, with a 5-year maturity, and a 6% coupon rate (stated interest rate), with annual payments.' This means that over the next 5 years, the company pays once-annual payments of 6% x $10,000 = $600; and on the maturity date (5 years from now) it additionally pays the **'face value.'** In other words, that verbal description of the bond indicates the following **schedule of cash payments**:

Time	**+1 year**	**+2 year**	**+3 year**	**+4 year**	**+5 year**
Cash flow promised	$600	$600	$600	$600	$10,600

Table 14.1: 5-year bond, $10k face value, 6% coupon paid annually:

You should be able to generalize from that example to be able to **specify the cash payments on any bond**, given any combination face value, maturity, and coupon rate. For example: 'A $100,000 face value bond, with a 3-year maturity, and a 12% coupon rate, with annual payments.' For this bond, the schedule of cash flows is:

Time	**+1 year**	**+2 year**	**+3 year**
Cash flow promised	$12,000	$12,000	$112,000

3-year bond, $10k face value, 12% coupon paid annually:

14.1.2 Bond valuation:

The next step is to be able to understand and calculate how the **'real' / market interest rate** will determine the **present value** of the bond, and thus, the price it will actually sell for in the financial market. That, in turn, will be how much **Cash** the company issuing the bond will receive upon the bond's issuance. Given that we have **already specified the cash flows**, this is just an application of the **core identity of finance—the one formula—that we drilled on last chapter.** All we need to go from a schedule of cash flows to a present value is the **discount / interest rate**.

[4] I will always assume annual interest payments to keep the exposition of the ideas clean and simple. In reality, it's more common for bonds to pay interest *semiannually*, twice yearly.

How do investors assess and price the 'riskiness' of corporate bonds? That's largely what you will learn in your dedicated finance classes. For our purposes, we will be *given* an interest rate, and need to know how to plug it in.

Consider our first bond above: 'A $10,000 face value bond, with a 5-year maturity, and a 6% coupon rate (stated interest rate), with annual payments.' We already laid out the cash flows it pays (Table 14.1). So, if the real / market interest rate on that bond is 8%, then the PV and issuance price will be:

$$P.V. of\ bond = \frac{\$600}{1.08} + \frac{\$600}{1.08^2} + \frac{\$600}{1.08^3} + \frac{\$600}{1.08^4} + \frac{\$10,600}{1.08^5} = \mathbf{\$9{,}201.46}$$

Now, what if, **instead**, the market had assigned a real/market interest rate of **5%** to a bond with the same contractual terms? Then the PV and issuance price would be:

$$P.V. of\ bond = \frac{\$600}{1.05} + \frac{\$600}{1.05^2} + \frac{\$600}{1.05^3} + \frac{\$600}{1.05^4} + \frac{\$10,600}{1.05^5} = \mathbf{\$10{,}432.95}$$

Note how, in this simple pair of examples, when the **real** / market interest rate (8%) is **greater** than the **coupon rate**, the present value and issuance price is **less** than the face value. And when the real / market interest rate (5%) is **less** than the coupon rate, the present value and issuance price is **greater** than the face value. It also turns out that, if the real interest rate is **the same** as the coupon rate, the present value will **equal** the face value.

This is **not a coincidence**, and will **hold generally**. The formal proof of this is too long and gnarly for this course. But, to 'prove' the last one to yourself—that if the coupon rate equals the true interest rate, present value equals face value—do the following calculation and similar ones: $\frac{\$600}{1.06} + \frac{\$600}{1.06^2} + \frac{\$600}{1.06^3} + \frac{\$600}{1.06^4} + \frac{\$10,600}{1.06^5}$. If the coupon rate in the numerators is equal to the true interest rate in the denominators, then the present value will always equal the face value, **every time**. Then, once you've convinced yourself of *that*, you can remember that, **holding the cash flows fixed** (coupon payments and face value), a higher (vs. lower) **interest rate** means a lower (vs. higher) **present value.** So, you should be able to know those *directional differences* without having to do a calculation.

Summarizing these *directional* relationships:

- **market interest rate = coupon rate** $\longleftrightarrow$ **present value = face value**
  - Jargon: Bond 'issued at par.'
- **market interest rate** $>$ **coupon rate** $\longleftrightarrow$ **present value** $<$ **face value**

  - Jargon: Bond 'issued at a discount'

- **market interest rate** $<$ **coupon rate** $\longleftrightarrow$ **present value** $>$ **face value**
  - Jargon: Bond 'issued at a premium'

14.2 Accounting for a bond issued 'at par'

Now, to segue to our **accounting** content, let's start with the **simplest** case of a bond issuance. As we saw above, if and only if the 'real' / market interest rate is equal to the stated / coupon rate on the bond, then the present value and issuance price of the bond will equal its face value.[5] In this case, we say that the bond is issued **'at par' (jargon)**.

14.2.1 Bond issuance

Consider again the bond contract we used as an example above, with a 6% annual coupon rate and a face value of $10,000. If and only if the real / market interest rate upon issuance were also 6%, the present value would be:

$$P.V.of\ bond = \frac{\$600}{1.06} + \frac{\$600}{1.06^2} + \frac{\$600}{1.06^3} + \frac{\$600}{1.06^4} + \frac{\$10,600}{1.06^5} + = \textbf{\$10,000.00}$$

Now, this will **rarely**, if ever, happen in **reality**: We're just using this as a starting **benchmark** for bond accounting. But, hypothetically, if this were to happen, the **accounting** for the bond issuance would be very **simple**: The company would get a **$10k Cash** inflow (a debit), and the face value that it is liable to pay off at maturity will also be **$10k**, and recorded in the *Bonds Payable* liability account. The journal entry would be:

Cash (+A):	$10,000	
Bonds Payable (+L):		$10,000

Bond issued at par, 1/1/2021

This is essentially how we accounted for loans (**Notes Payable**) earlier in the course, just with *Bond* in lieu of *Note*.

[5] Again, the proof of this is pretty gnarly. You can 'prove' this to yourself by pasting a bunch of calculations into Google as your calculator—as long as the numerator (the coupon payment) and the denominator (the real interest rate) line up, the PV will equal the face value. Here are some examples to get you started: (1.) A 3-year $10k bond with 3% coupon rate and 3% real market interest rate: $300/1.03 + 300/(1.03^2) + 10300/(1.03^3)$; (2.) A 6-year $100k bond with an 8% coupon rate and a 8% real market interest rate: $8000/1.08 + 8000/(1.08^2) + 8000/(1.08^3) + 8000/(1.08^4) + 8000/(1.08^5) + 108000/(1.08^6)$.

14.2.2 Subsequent Interest Expenses / Payments

Additionally, in this special case of a bond issued at par, accounting for subsequent interest expenses is also easy. Let's keep things simple and assume our company does annual reporting on January 1st, and also issued its bond paying annual interest payments on January 1st. That way, **we don't need to worry about interest accruals** (because the interest cash payment and expense recognition happen in full and on the same date). We'll make this simplifying assumption throughout this chapter. Since the coupon rate and true market interest rate upon issuance were both 6%, the annual **interest payment and interest expense are both $600**. So, we would account for each annual interest payment like so:

Interest expense (-S.E.):	$600	
Cash (-A) :		$600

Annual interest payment and expense, 1/1/2022

So, here the accounting is easy. When the bond does not issue at par—that is, when the market rate is not equal to the coupon rate—things get more challenging.

14.2.3 Why can't companies just set their coupon rate equal to their market interest rate?

Why can't companies set their coupon rates equal to their market interest rates, and make the accounting easy and clean, like the above? That is, why can't this chapter just end here? The answer is that **companies try** to get close—they try to set their coupon rates close to what they expect the market rate will be upon issuance. But they can never guarantee total success. The financial market is a free market, and investors make up their own minds about what they're willing to pay for any bond. The company has to **set the coupon payments in advance**, so it can go through all kinds of **legal and regulatory hoops** before issuing the bond to the market, and overall market conditions and sentiment can change in that time. In other words, the company can't **'discover'** its real market interest rate until it actually sells the bond into the market. And it can't sell the bond until it sets the contractual terms—the face value and coupon rate. The **problem is unavoidable.**

Concretely, if the market interest rate is higher than the coupon rate, the bond will be **issued "at a discount"** to its face value. And if the market interest rate is lower than the coupon rate, the bond will be **issued "at a premium"** to its face value. We'll now cover the accounting for each case, in turn.

14.3 Bond issued at a discount:

Consider again our example of a bond with a $10,000 face value, a 6% annual coupon rate, and a 5-year maturity. But now, suppose the **real / market interest rate** upon its issuance is **8%**. Then the implied present value and, thus, the issuance price, would be:

$$\textit{Issuance Price} = \textit{P.V.} = \frac{\$600}{1.08} + \frac{\$600}{1.08^2} + \frac{\$600}{1.08^3} + \frac{\$600}{1.08^4} + \frac{\$10,600}{1.08^5} + = \mathbf{\$9{,}201.46}$$

Because the $9,201 issuance price is lower than the face value, we say the bond is issued "at a discount" **(jargon).**

14.3.1 Issuance

Now, consider the **accounting problem**. Our company gets a $9,201 **Cash (+A)** infusion (debit); but the face value we are liable to pay in 5 years is $10,000. How does accounting deal with this difference? The **rule** is we credit **Bonds Payable for the full face value** ($10,000), and **'plug' the difference** with a new account called **'Discount on Bonds Payable.'** So, obeying that rule, the journal entry upon issuance would be:

Cash (+A):	$9,201.46	
Discount on Bonds Payable (+contra-L):	$798.54	
Bonds Payable (+L):		$10,000

Bond issued at a discount, Jan 1 2021:

What exactly *is* this **Discount on Bonds Payable**? As the journal entry above indicates, it is a **contra-liability account**. This is the first contra-liability account we've seen in this course. But it fits previous patterns we've seen, of how a contra-account will plug a difference, and separately track some kind of a reduction in another account. In this case, upon issuance, the **Discount on Bonds Payable** tracks the difference between the **face value** (the payment due on the maturity date) and the **present value** of the bond. And we want them tracked separately, because the company *will eventually pay* that face value. Setting up the T-accounts, those would look like so, at this point:

Bonds Payable (L)

Debits	Credits
	$10k

Discount on B/P (contra-L)

Debits	Credits
$798.54	

Another way to think about this is to **forget about the 'meaning,'** and simply note that we need to **'plug'** the difference between the **cash flow** and the related **accrual account** (the Bonds Payable liability), a common accounting move.

14.3.2 Introducing 'Carrying Value'

Now, we need to introduce one vital bit of terminology (**jargon**). We use the term **'Carrying Value'** to indicate the 'net' value of the Bonds Payable on the company's books—that is, net of its *Discount* contra-account. (This is quite similar to 'book value,' the value of some asset less its related contra-account, e.g. *Equipment* and *Accumulated Depreciation*. Formally:

$$Carrying\ Value\ =\ Bonds\ Payable\ -\ Discount\ on\ Bonds\ Payable \tag{14.1}$$

(Or, you can just think of it in terms of those 'stacked' T-accounts above—the *Bonds Payable (L)* account minus its contra-account amount.) So, after the issuance, per the journal entry above, the **initial carrying value** will be $10,000 - $798.54 = $9,201.46. Note that, per our **rule**, *Bonds Payable* is always credited for the full **face value on the issuance date**. So, on the issuance date, the carrying value will also equal the *Face Value* minus the *Discount on BP*, which is just the issuance price ($9,201.46). But, as we'll see, this will not hold going forward—-because the *Discount on BP* (and thus the carrying value will be *updated* with each interest payment).

14.3.3 Subsequent expenses:

So we just solved the accounting problem of the **difference** between the **face value** and the **issuance price** of the bond on the *issuance date*—just the old accounting trick of creating a contra-account as a **plug**.

So, now, we need to account for subsequent interest payments and expenses. (Note that, per our simplifying assumption that the bond is issued on Jan 1st, the reporting date, and pays annual interest, both the expense and the payment will be recorded at the same time.) Let's start with what we know for sure. By definition, the **annual cash interest payment** on this bond is fixed by the terms of the bond itself. So, we know that that will be a credit of $600. So, here's what we know right now:

Interest Expense (-S.E.):	???	
???	???	
Cash (-A):		$600

First interest payment, Jan 1 2022 **(State of our Ignorance)**:

But what is the *Interest Expense*? The **next accounting problem** we face is that the **real / market interest rate** will be different from the stated coupon rate. And, per our core finance theory, the real / market interest rate determines the real / **'economic' cost** to the firm of getting its debt financing. So it would be problematic to allow companies to base their reported *Interest Expense* on their *stated* coupon rate.[6]

So, how exactly does accounting deal with this issue? By now, you are probably primed to recognize that we **use the real/market interest rate upon issuance** (8% in our current example) rather than the stated/coupon rate (6% in our current example) to calculate the Interest expense per period. So, do we multiply that 8% times the $10,000 face value, and recognize $800 in annual *Interest Expense*? **No.** Remember that on the initial issuance date, the market actually paid **$9,201.46** (which is also the initial carrying value of the bond). So that is like the real initial **loan** the company got.

It turns out that the **rule** is that we multiply the real / market interest rate by the **Carrying Value** (CV), not face value, to calculate the *Interest Expense* each period. That is:

$$Interest\ Expense\ =\ CV\ \times Market\ Interest\ Rate\ upon\ issuance \tag{14.2}$$

So, after the first year, that would be a debit of $9,201.46 x .08 = $736.12. So, our **next and final accounting problem** here is that our Cash credit ($600) and our *Interest Expense* debit ($736.12). How do we deal with this? Once again, the *Discount on Bonds Payable (-contra-L)* account will *plug* the difference. So, in fact, our full journal entry for the first annual interest expense would be:

[6] As an edge case, suppose that a company issued a $10,000 face-value, zero-coupon bond—in other words, had an annual coupon payment of $0—but this company was *actually* quite *risky*. In that case, the market would assign a high *real interest rate* to the bond, and its *issuance price* would thus be far below $10,000—say, e.g., $6,000. So, that case, there would be a **real cost of that debt financing,** even though there was **$0 in annual coupon payments**. Intuitively, we shouldn't allow that company to falsely report that it has $0 in *Interest Expense*. We need some way to account for the real cost of the debt.

Interest Expense (-S.E.):	\$736.12	
Discount on Bonds Payable (-contra-L):		\$136.12
Cash (-A):		\$600

First annual interest payment/expense, Jan 1, 2022, in full:

This means that, after this journal entry, the balance of the *Discount on Bonds Payable* will be \$798.54 -\$136.12 = \$662.42. (Remember that the Discount on BP is a debit account so credits to it are *reductions*.) Visualizing with the T-accounts:

Bonds Payable (L)

Debits	Credits
	\$10k

Discount on BP

Debits	Credits
\$798.54	\$136.12
\$662.42	

And, per its definition, the updated *Carrying Value* of the bond would be:

$$Carrying\ Value\ =\ Bonds\ Payable\ -\ Discount\ on\ B.P.\ (balance) \tag{14.3}$$

$$Carrying\ Value\ = \$10,000 - \$662.42 = \$9,337.58 \tag{14.4}$$

(Note that we also could have updated the Carrying Value more directly by just adding the \$136.12 change in the *Discount* to the prior Carrying Value.)

We'll discuss some *intuitions* for what's going on in the next section. But for now, let's just keep applying our **rote rules**. What do we do about the *next interest payment* (in 2023)? As always, the **cash interest payment** is fixed at \$600. The *Interest Expense* is, by definition, $Carrying\ Value \times Market\ Interest\ Rate\ upon\ issuance$. Calculating, that is: $\$9,337.58 \times .08 = \$747.00$. And we 'plug' the difference between the two by reducing the *Discount on BP*. So, the journal entry for the next interest expense and payment would be:

Interest Expense (-S.E.):	$747.00	
Discount on Bonds Payable (-contra-L):		$147.00
Cash (-A):		$600

Second annual interest payment/expense, Jan 1, 2023

And then, after that interest payment and expense, our updated *Discount on Bonds Payable* balance will be $662.42 - $147.00 = $515.42.

Discount on BP

Debits	Credits
$798.54	$136.12
	$147.00
$515.42	

Discount on BP (contra-L) after first Interest

And so our updated Carrying Value will be: $\$10,000 - \$515.42 = \$9,484.58$. And so, in turn, our *Interest Expense* for the *next* year (2024) will be: $\$9,484.58 \times .08 = \$758.77$. And then we just keep *plugging and chugging*, as long as our question requires!

14.3.4 Backing Up: Summarizing The Rules

So, we just worked through an example in linear order, and introduced a lot of new **jargon/terminology**. So, if your head is spinning a bit, mine is too. But everything we did can be boiled down to a couple of **rote rules**, which we can memorize and **cling to** as we develop our understanding.

Rules for Bonds Issued at a Discount (market interest rate $>$ coupon rate)

- **Rule #1:** On the **issuance date**, credit the full **face value** ($10,000) to ***Bonds Payable***; debit the **issuance price** (present value) to **Cash**; and 'plug' the difference with a debit to ***Discount on Bonds Payable (contra-L)***.
- **Rule #2:** Define: $Carrying\ Value = Bonds\ Payable - Discount\ on\ BP\ (balance)$
- **Rule #3:** In each period, the *Interest Expense* is calculated as:
  $Interest\ Expense = Carrying\ Value \times Market\ Interest\ Rate$.
- **Rule #4:** 'Plug' the difference between the **cash interest payment** and that *Interest Expense* with a credit to *Discount on Bonds Payable*.

- **Rule #5:** And remember to *update* the Carrying Value, based on the updated *Discount*, before calculating the subsequent year's *Interest Expense*.

Or, we can show the **journal entries** in general form. The journal entry for the initial *issuance* of a bond at a discount will always be:

Cash (+A):	$(Issuance Price [PV])	
Discount on BP (+contra-L):	$(Face Value - Issuance Price [PV])	
Bonds Payable (+L):		$(Face Value)

Bond issued at a discount, Jan 1 2021:

The Carrying Value (CV) will always be as defined above. And the subsequent *Interest Expenses* and cash interest payments will always be:

Interest Expense (-S.E.):	$(CV * Market Interest R)	
Discount on BP (-contra-L):		$(Difference)
Cash (-A):		$(Coupon Rate * Face Value)

Subsequent annual interest payment/expense, Jan 1, 202x

14.3.5 Intuition: What's going on here?

It is very challenging to get intuition for what's going on here. For solving problems, it's best to cling to the rules. But here are some things that could make some intuitive sense:

- **First**, the actual **issuance price** of the bond is like the amount that the market actually 'loaned' to the company. So it should be intuitive that, the *first* interest expense is the market interest rate times the initial carrying value, which is that number.

- **Second**, note that with each *Interest Expense* and interest cash payment, we **credit** the *Discount on BP (contra-L)* account. Since that is a *debit account*, the credits are **reductions.** So, we are **"using up"** the 'Discount' over time, allocating it across periods. And this means, in turn, that the **Carrying Value** increases up to the **Face Value** as of the **maturity date**. This is why this process is called **bond "amortization"**—it's a way of *apportioning* an abstract B/S account. (See Figure **??** below.)

- **Third**, note that for bonds issued at a **discount**, the market interest rate is **higher** than the pre-set **coupon payments**. So, one way to think about this is that it is *as if* the company is 'falling behind' on paying its real cost of debt. So, the *Carrying Value* of the bond—and, thus, in turn, the *Interest Expenses*—**increase** over time. This is just like what would happen if you fell behind on credit-card interest payments: Your balance would increase, so your interest would *compound*.

- **Fourth**, in simple cash terms, the company issuing this bond is **paying two forms of cash costs** for its bond financing. It's paying the cash **interest payments**, obviously. But it's **also** paying the **difference between the face value and the issuance price**. I.e., when a company issues a bond at a discount, the cash it gets at the beginning ($9,201.46) is less than the face value it will have to pay at the end ($10,000). The **difference** between them is, by definition, the **initial Discount**. And, what this whole algorithm is doing is **apportioning** that Discount out as expenses over time, **on top of** the company's cash interest payments. So, this looks like a **familiar tactic** in accrual accounting—apportioning a net cash outflow evenly over time, to reconcile cash to accruals.

If none of these intuitions make sense to you yet, don't panic. The **rules work** whether or not we think they should. If you just want the right answer, the algorithm has your back.

14.4 Bonds issued at a premium:

Now, let's cover the final possible case, when the **market** interest rate on the bond is **lower** than the pre-set **coupon** rate, and it issues at a **premium**.

14.4.1 Differences between a bond issued at a discount

After all the work we did in the previous section, this will be relatively quick and easy, because virtually everything above applies *symmetrically*, with only two minor, and predictable, semantic differences:

- **First**, because the bond is issued at a *premium*, instead of having a contra-liability account (*Discount on BP*) as a plug, we use ***'Premium on Bonds Payable (+L).'*** This is a normal liability account, a credit account. So, we write it up with a *credit* on the issuance date, and will reduce it via *debits* in the later amortization.

- **Second**, predictably and symmetrically, the Carrying Value (CV) is now defined as:

$$CV = \textit{Bonds Payable} + \textit{Premium on Bonds Payable}. \tag{14.5}$$

14.4.2 The Rules

And so our **rules** for bonds issued at a premium are **substantively identical** to those for bonds issued at a discount, just with those changes.

- **Rule #1:** On the **issuance date**, credit the full **face value** to ***Bonds Payable***; debit the **issuance price** (present value) to **Cash**; and 'plug' the difference with a credit to ***Premium on Bonds Payable (L)***.
- **Rule #2:** Define: $Carrying\ Value = Bonds\ Payable + Premium\ on\ BP\ (balance)$
- **Rule #3:** In each period, the *Interest Expense* is calculated as: $Interest\ Expense = Carrying\ Value \times Market\ Interest\ Rate$.
- **Rule #4:** 'Plug' the difference between the **cash interest payment** and that *Interest Expense* with a debit to *Premium on Bonds Payable*.
- **Rule #5:** And remember to *update* the Carrying Value, based on the updated *Premium*, before calculating the subsequent year's *Interest Expense*.

And, as before, we can show the **journal entries** in general form. The journal entry for the initial *issuance* of a bond at a premium will always be:

Cash (+A):	$(Issuance Price [PV])	
Premium on BP (+L):		$(Issuance Price [PV] - Face Value)
Bonds Payable (+L):		$(Face Value)

Bond issued at a premium, Jan 1 2021:

The Carrying Value (CV) will always be as defined above. And the subsequent *Interest Expenses* and cash interest payments will always be:

Interest Expense (-S.E.):	$(CV * Market Interest R)	
Premium on BP (-L):	$(Difference)	
Cash (-A):		$(Coupon Rate * Face Value)

Subsequent annual interest payment/expense, Jan 1, 202x

14.4.3 Example

Go back to our primary bond example, with a **5-year maturity**, **$10k** face value, and a **6% coupon** paid annually. Now let's suppose that the **market** interest rate on the bond

upon issuance was **5%**. Then the present value and issuance price of that bond would be:

$$Issuance\ Price = P.V. = \frac{\$600}{1.05} + \frac{\$600}{1.05^2} + \frac{\$600}{1.05^3} + \frac{\$600}{1.05^4} + \frac{\$10,600}{1.05^5} + = \mathbf{\$10{,}432.95}$$

And, applying our **rules**, the journal entries for the issuance and subsequent interest payments would be:

Cash (+A):	$10,432.95	
Premium on Bonds Payable (+L) :		$432.95
Bonds Payable (+L):		$10,000.00

Bond issuance at a premium, Jan 1 2021

The **initial Carrying Value** would be $10,432.95. So the first annual *Interest Expense* would be $10,432,95 x .05 = $521.65. Applying our **rules**, the journal entry for the first interest payment date would be:

Interest Expense (-S.E.):	$521.65	
Premium on Bonds Payable (-L):	$78.35	
Cash (-A):		$600

First annual interest payment/expense, Jan 1, 2022:

And so, the updated balance of the Premium would be: $432.95 - $78.35 = $354.60. Or, if you prefer to see this with the T-account:

Discount on BP

Debits	Credits
$78.35	$432.95
	$354.60

Premium on BP (L) after first Interest

So the updated Carrying Value would be: $10,000 + $354.60 = $10,354.60. So the subsequent Interest expense would then be: $10,354.60 x .05 = $517.73...and we would keep applying that algorithm, **updating the Carrying Value** after each interest payment, and **plugging and chugging**, as long as our question requires.

14.4.4 Intuition

It's very hard to get intuition here. Let's try to just 'flip' the intuitions we worked on for bonds issued at a discount.

- **First**, note that for bonds issued at a **premium**, the pre-set coupon rate is **higher** than the real **market interest rate**. So, one way to think about this is that it is *as if* the company is paying **more** than its real interest cost of debt, so it is as if it is **'paying down' the principal of the initial 'loan' of $10.4k** as well. This is just like how **installment payments** have an *implicit interest rate*, but fixed payments over time, so each payment represents interest but **also a reduction in the outstanding principal**. (This is also just how home mortgages work. Mortgages have an implicit interest rate, but homeowners pay essentially fixed monthly mortgage payments. Homeowners increase their **home equity** with each payment, because each one represents both *interest* and paying down the principal.)

  And, since the *Carrying Value* is reduced over time, the *Interest Expense* recorded in each period decreases as well. This should also make intuitive sense. It's like if you paid off *more* than your minimum interest payment on your credit card. That would reduce your outstanding *balance*, which would reduce the interest you were charged.

- **Second**, in simple cash terms, the company issuing this bond is incurring the **cash cost** of paying **coupon payments** ($600 $\times$ 5 years), but that is partially **offset** by the **positive net cash flow** from selling the bond at a premium to its final **face-value** payment. That is, it gets $10.4k on issuance, but will only have to pay $10k of face-value on the maturity date. So, that $400 difference **"offsets"** the cash interest payments, reducing the *Interest Expense* over time.

- **Third**, note that with each *Interest Expense* and interest cash payment, we **debit** the *Premium on BP (L)* account. Since that is a *credit account*, the debits are **reductions.** So, we are **"using up"** the 'Premium' over time, allocating it across periods. And this means, in turn, that the **Carrying Value** decreases down to the **Face Value** as of the **maturity date**.(See Figure **??** below.)

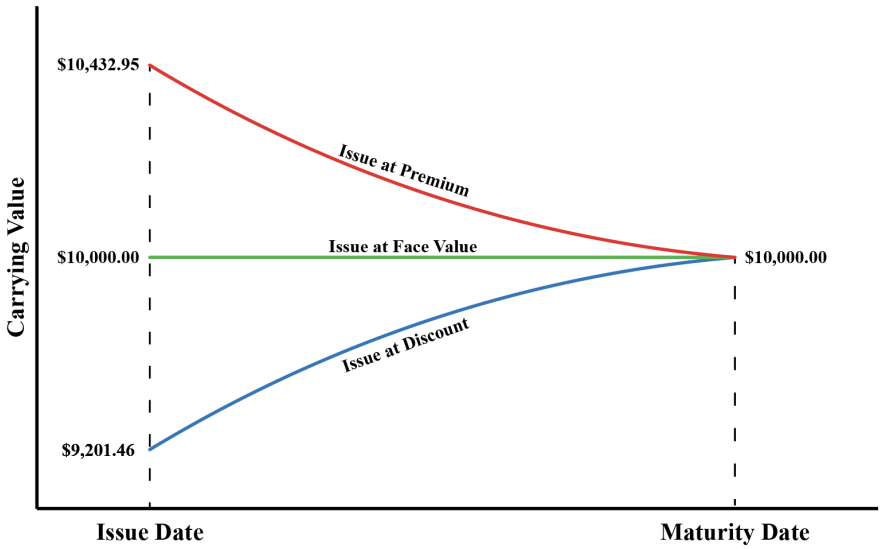
14.4.5 FAQ: Why would anyone buy a bond at a 'premium'?

One question that students often have when we discuss bonds issued at a premium, is 'Why would the market pay more than the face value of the bond—the cash payment it will actually get at the end?' And while this does seem odd to first-time learners, there is an **easy answer** to this question: Bond buyers in these cases are willingly paying more than face value, because they are getting **compensated** by the **relatively high coupon**

payments in the **interim period**. Since the coupon rate is higher than the real/market interest rate, they are still getting the **return** they require **overall**, even though the final face-value payment they will receive at the end is less than their initial investment.

14.4.6 Visualizing premium/discount amortization

It can be very helpful to visualize the 'amortization' process for bonds issued at a premium vs. discount together. In both cases, the *face value* is different from the *issuance price*, which is the *initial carrying value*. And then, as we reduce the *Discount* or *Premium*, amortizing it with each interest payment and expense, the Carrying Value converges to the *Face Value*. See the figure below for a visual representation:



Bond Amortization

14.5 Repurchasing or calling a bond:

14.5.1 Callable bonds

So far in this intro class, we've talked about bonds in a fairly **general way**. But, as always, **reality** can be incredibly **complex**. At the end of the day, **bonds are just contracts**—agreements by the company to make certain payments at certain dates, and specifying other rights, conditions, and obligations for the company and bondholder. A typical **credit agreement** can run to almost 100 pages, or more. (This is one reason why there are so many white-collar jobs in and around the financial sector.) And so, the **complex reality** is that these contracts can be written in **any number of ways**.

One of the most significant parameters in a bond contract, worth knowing about, is whether or not the bond is **'callable.'** A 'callable' bond is one in which the bond contract stipulates that the **issuer *can* 'call'** the bond—that is, essentially, pay to *extinguish it* and cancel all the future payments—at a pre-specified **price**. **Economically,** this is essentially the **same** as the issuer having the right to **repurchase** the bond at the specified **call price**. But, the legal structure, mechanics, and **semantics** are a bit different. For callable bonds, it's conventional to refer to this as **'redeeming'** the bond rather than 'repurchasing.'

Why would our company to 'redeem' one of its callable bonds? The most common and significant reason would be a change in **overall market interest rates**. For example, suppose that when we originally issued our bond, the interest rate for bonds for companies with our credit rating was 7%. But now, thanks to Federal Reserve policy and other factors, that prevailing market interest rate is 3%. Clearly, we would rather pay a 3% interest rate than 7%! So, in such a condition, we could issue **new bonds** at the 3% interest rate, and use the **cash proceeds** to **redeem** our old bond, and thereby **reduce** our **interest payments**.

14.5.2 Repurchasing bonds

Even if the bond **contract does not** make it 'callable' at a **pre-specified price**, bonds are *traded* in free **financial markets**. So, companies can *repurchase* their own bonds, directly from sellers, or via brokers. In repurchasing a bond, the company essentially pays the **present value** (market price) today, in order to extinguish all of its future payments. So, this is, in essence, just **reversing** the bond **issuance**. Why would companies do this?[7] There could be any number of reasons. Corporate finance is about companies' needs for **cash today** vs. **cash in the future**. Perhaps the company issued the bond in the past, because it needed a cash infusion at that time. But then, perhaps its subsequent sales in the interim were better than expected; so, now it has extra cash, and wishes to pay off its debts early. Or, perhaps the company has a new CFO who has decided to change its **capital structure**. It could issue more Common Stock and use the cash proceeds from that sale to **pay off debts** thereby decreasing its **leverage**.

[7] Warning: advanced material. If you understand our core finance theory and present-value relations very deeply, you may be able to understand that, for non-callable bonds, our company would not benefit from refinancing—e.g., repurchasing a bond issued at 7%, with the purchased financed by issuing a new bond at 3%—in quite the same way. Why? The reason is that, based on present-value identities, the decline in the market interest rate from 7% to 3% would increase the present value, and thus the market price, of our bond. So we'd have to pay much more than face value to repurchase it for the market price. And so it turns out that repurchasing a bond at *the market price* doesn't, by itself, make us any better off. There's no free lunch in a competitive marketplace. The reason why *refinancing* a callable bond does help us is that the 'call price' is fixed in advance. If this makes your head spin, don't worry. You'll spend weeks on this in subsequent finance courses.

14.5.3 FAQ: Why not only issue callable bonds?

So, based off of what we learned above, companies can repurchase 'normal' (non-callable) bonds in the bond market, at the prevailing **market price.** However, if they issue 'callable' bonds, then they have the *right* but no obligation (that is, to use a core finance term, the ***option***), to repurchase it at a pre-specified **'call price.'** Thus, 'callable bonds' give the **issuing company** additional **options** or **optionality**—most typically, the ability to profitably **refinance** if interest rates decrease.

In that case, why don't firms *only* issue **callable** bonds? Go back to our **core finance theory**. For the corporation **issuing the bond**, the call provision is an **option** that gives it **potential upside**, if interest rates decline. But, the **flip side** is that the **issuing corporation's optionality is the bond buyers risk**. For the bond buyer, that is the risk of being **deprived** of the interest payments, if market rates decrease in the future. So, if the **bond buyer faces more risk** from a callable bond, then, given our core finance theory, that means they will charge a **higher interest rate**. There's **no free lunch** in competitive markets—just **tradeoffs**.

14.5.4 Accounting for repurchasing or calling a bond

In **either case**—whether a company 'redeems' a callable bond at a pre-specified price, or repurchases its bond in the bond market—the accounting **journal entry** is the essentially the **same**. Why? Because in both cases, the company is paying out **Cash** and **extinguishing** all of the bond-related accounts. The same **accounts** are updated, so the **journal entries** are updated, regardless of the underlying bond's **type**. The journal entry will typically have **four rows**, but is essentially an extremely simple algorithm:

The rules:

- **Rule #1:** Credit **Cash** for the repurchase / call price
- **Rule #2: Extinguish** that bond from all of its accounts (*Bonds Payable* and the *Discount* or *Premium*)
- **Rule #3: Plug** the remainder as a *Gain* (if credit) or *Loss* (if debit)

That's really it. Let's show a concrete example, and then talk about the intuition. Let's pick up where we left off in the example of a bond issued at a premium, right after its first interest payment on January 1, 2022 (Table **??**). Suppose that the company either calls or repurchases this bond for **$10,000** immediately after that. What do we do?

Following the rules, we **credit cash** for the $10k disbursement. Then we **extinguish** the bond-related accounts: *Bonds Payable* and, in this case, the *Premium on Bonds*

Payable. Bonds Payable is on the books at $10k, and the *Premium* now has a balance of $354.60 (Table **??**). Those are *both* credit accounts, so we **extinguish** them both with **debits**. This means that the required **plug** is a **credit** of $354.60—a **Gain**.

Bonds Payable (-L):	$10,000.00	
Premium on Bonds Payable (-L):	$354.60	
Cash (-A):		$10,000.00
Gain (+S.E.):		$354.60

Repurchasing or calling our bond-at-premium for $10k, Jan 2, 2022:

To be safe, I just wrote out the journal entry step by step, then added the Gain as a plug at the end. But you can also think through this **intuitively**, as being like the 'flip side' of the sale or disposal of an asset.

Intuition

The **Carrying Value** of this bond (a liability) was **$10,354.60**. The carrying value is essentially like the 'book value' of a bond. The company **paid** out **$10k** in cash in order to extinguish that liability from its books. That is, it *paid less* than 'book value' to get rid of the liability. So, it should make intuitive sense that that is a 'Gain' of $354.60. As you might be able to see, extinguishing a bond liability is beautifully **symmetric to** the Gains and Losses from selling (extinguishing) an asset, as covered in Ch 10.

- If you sell an asset at more (vs. less) than book value, that's a gain (vs. loss).
- If you repurchase a bond liability at more (vs. less) than CV, that's a loss (vs. gain).

14.6 Installment Loans

Another way in which companies can finance themselves and their purchases is with **Installment Loan** contracts. In this case, instead of paying back small interest payments in the interim, and a large face-value payment on the maturity date, the creditor pays **the same amount each period**.

Time	**+1 Year**	**+2 Years**	**+3 Years**	**+4 Years**	**+5 Years**
Install Payment	$2,400	$2,400	$2,400	$2,400	$2,400

Contract we call 'installment payment'

You may recall that we discussed this at the very beginning of the *Introduction to Finance* chapter. We noted that, although nothing was explicitly called 'interest' in this

contract, there was an *implicit* cost of financing. And so, despite the name, an installment contract is essentially the same as a loan / bond, just with a different **pattern** of payments. We should understand that now given our mastery of the **core identity of finance**.

Now, suppose that suppose that our company's **interest rate** is 8%, so we get $9582.50 in cash today, in exchange for signing the installment-payment contract above. That is:

$$PV\ of\ Installment = \frac{\$2.4k}{1.08} + \frac{\$2.4k}{1.08^2} + \frac{\$2.4k}{1.08^3} + \frac{\$2.4k}{1.08^4} + \frac{\$2.4k}{1.08^5} + = \mathbf{\$9582.50}$$

14.6.1 Issuance date

How do we account for this? Let's start with the initial **contract date**. That's easy enough. Our company gets a **cash infusion** (a debit) equal to the installment loan amount, which is the present value, $9,582.50. And we balance that with a **simple single credit to *Notes Payable***. Easy enough:

Cash (+A):	$9,582.50	
Notes Payable (+L):		$9,582.50

Getting $9,582.50 Installment Loan, 1/1/2021

14.6.2 Subsequent installment payments and interest expenses

Now, the harder part: **How do we account for the subsequent installment payments?** Recall that, as we said in Chapter 10, there is a 'real' cost of this debt financing here, a real interest rate. So we do need to account for an *Interest Expense* here, even though nothing is called *Interest*.

It turns out that we use essentially the same algorithm we used for *Bonds Issued at a Premium*, with only some minor semantic differences. Note that you can **conceptualize this installment payment** as a **bond with a $2.4k coupon and zero face value**. The Interest Expense we would recognize each period would be the same. This will become clearer once we do an example. The **rules** for Installment Payments, with their slightly-revised semantics, are:

- **Rule #1:** As before, the issuance amount ($9,582.50 in this case) is the **initial Carrying Value**.
- **Rule #2:** As before, the *Interest Expense* recognized is the Carrying Value times the 'real' market interest rate upon issuance.

- **Rule #3:** But, in the case of an installment contract, we **plug the difference directly in *Notes Payable*** via a debit, rather than a contra-account.

- **Rule #4:** And, the updated **Carrying Value** is just the updated balance of *Notes Payable*, since we *directly* credited it.

14.6.3 Installment Payment Examples

Let's make this concrete, and just apply these rules, before backing up. We already covered the issuance of this installment note on Jan. 1, 2021 (Table **??**) above. So, next, let's cover the **first annual installment payment** and interest expense recognition, on Jan. 1, 2022. **Per the contract terms**, the **Cash** credit is $2,400. Per **Rule #2**, the *Interest Expense* we will recognize is the Carrying Value times the real market interest rate upon issuance: $\$9,582.50 \times .08 = \$766.60$. And per **Rule #3**, we directly plug the difference in *Notes Payable*. So, our journal entry will be:

Interest Expense (-S.E.):	$766.60	
Notes Payable (-L):	$1,633.4	
Cash (-A):		$2,400

First Installment Payment and Interest Expense, 1/1/2022

And, per **Rule #4,** the updated **Carrying Value** will be the new balance of *Notes Payable*, which will be: $9,582.50-$1,633.40 = $7,949.10. Or, showing this via the T-account:

Notes Payable

Debits	Credits
$1,633.40	$9,582.50
	$7,949.10

Notes Payable (after first annual installment payment)

So, then, the *next* Interest Expense, recognized on January 1, 2023, will be $\$7,949.10 \times .08 = \$635.93$. And, the journal entry on that date will be:

Interest Expense (-S.E.):	$635.93	
Notes Payable (-L):	$1,764.07	
Cash (-A):		$2,400

Second Installment Payment and Interest Expense, 1/1/2023

And, the new balance of *Notes Payable*, which is the **Carrying Value** in this case, will be: $7,949.10 -$1,764.07 = $6,185.03. Or, showing this via the T-account:

Notes Payable

Debits	Credits
$1,633.40	$9,582.50
$1,764.07	
	$6,185.03

Notes Payable (after second annual installment payment)

14.6.4 Intuition: Each payment represents interest and principal

Despite slightly different **mechanics**, the idea here is exactly the same as in the case of a *Bond Issued at a Premium*. Indeed, the intuition might be somewhat clearer in the case of an installment payment. In an **installment payment**, there is no large 'face value' payment at the end. So each and **every** payment clearly represents **economic interest**—the cost of debt financing—as well as **paying down the initial principal**. It is just like **paying off a mortgage** and thereby building **home equity**. This is why the *Interest Expense* is **smaller** than the **installment payment** in each year. Also note that the **Carrying Value** decreases over time, reflecting this. Because each Installment Payment represents *interest* as well as principal, the book value of the liability decreases over time.

This is exactly the same as the *Bond Issued at a Premium*, with only one difference: In that case, we had a separate account for *Bonds Payable* and the *Premium*, and only updated the latter account with each interest payment. For the installment contract, we use just one account, *Note Payable*, and update it *directly* with each payment. So, working through one should help you build intuition for the other.

14.7 Lease accounting:

The last topic we'll cover in this chapter is something that *sounds boring*, but is actually a surprisingly live, controversial, and *interesting issue*: lease accounting.

Let me set this up with a **thought experiment**. Suppose that a small **commercial airline** wants to **use a plane** that costs **$8m** to purchase, but it **doesn't have the cash** on hand. There are two different ways in which the **airline** and the manufacturer could **structure a transaction.**

- **Option #1**: The manufacturer could finance the airline's purchase of the plane with an installment notes—giving it the $8m plane in exchange for promised installment payments of $1m per year for each of the next 10 years. Then, the airline would get the plane today, but have to pay back $1m per year over the next 10 years. Here's a way of visualizing this contract, from our airline's perspective:

Year:	**1**	**2**	**3**	**...**	**10**
Exchange:	+1 Airplane	-$1m	-$1m	-$1m	-$1m

Installment-note financed purchase of plane (airline's perspective)

- **Option #2**: An alternative is that the airline could lease/rent the plane from the manufacturer, agreeing to pay annual rental/lease payments of $1m per year over the next 10 years. Here's a way of visualizing this contract, from our airline's perspective:

Year:	**1**	**2**	**3**	**...**	**10**
Exchange:	+1 Airplane	-$1m	-$1m	-$1m	-$1m

10-year Leasing agreement for plane (airline's perspective):

Do you see what this thought experiment is getting at? We *call* **Option #1** a **'purchase' financed by an installment note**, and we *call* **Option #2** a **lease**. But, the **real economics**—the actual exchanges of resources—are **exactly identical** in the two cases.

This is a general challenge for accounting. Despite the identical *real economics* of the two examples above, until recently, the two were accounted for differently. Many companies realized that they could make themselves look less risky, by reducing their reported liabilities, by choosing to **legally structure** transactions as "leases," instead of debt-financed purchases.

To understand the implication more clearly, recall that one of the **primary metrics** that creditors use to assess **credit risk** is $Leverage = \frac{A}{E} = \frac{L}{E} - 1$. If a company were to structure this transaction as **Option #1**, above—a purchase financed by a *Note*—that would increase both its Assets and its Liabilities by $8m. So, its Shareholders' Equity would be unchanged, and *Liabilities* would increase, increasing its reported **Leverage**. Under prior accounting standards, if the company were to, instead, use **Option #2**,

structuring it as a **lease**, then the company's reported **Liabilities** and **leverage** would be **unchanged**. Instead, the lease payments would have been recorded as *periodic expenses*.

In short, companies could **conceal** their **real, economic liabilities** and **riskiness** by choosing to **structure** transactions as **leases** rather than **loan-financed purchases**. This became a major, salient issue during the 2009 financial crisis. Google: 'Off-Balance Sheet Liabilities.' As a result, in recent years, **accounting standard-setters have responded.** As of 2019 under **GAAP**, U.S. public companies are now required to **record their leases as Liabilities, matched by the Lease Asset,** if any of the following four criteria are met:

1. Ownership of the asset is schedule to transfer at end of the lease period.
2. Lessee has option to buy asset at 'bargain' (below market) price.
3. Lease will last at least 75% of the useful life of the asset.
4. Present value of lease payments is > 90% of the fair value of the asset.

Google "FASB 13 (Topic 840)" if you wish to know more. You can try to memorize all of those rules. Or, you can note that they essentially boil down to: "Factors that seem to indicate that the relationship is **really, essentially ownership** of the asset, just **concealed** and structured as a lease." If those criteria are met, the **accounting** is relatively **simple**. We must calculate the **present value** of the **contracted future lease payments**, using **The One Formula in Finance**, as always. And then we credit *Notes Payable (+L)* and debit the *Lease Asset (+A)* for that amount.

Lease asset (+A):	$(PV of lease payments)	
Notes Payable (+L) :		$(PV of lease payments)

Capitalizing a lease that meets the criteria, 10/31/2021

15

Statement of Shareholders' Equity

This chapter is about the Statement of Shareholders' Equity (SSE). The unique focus of this statement is tracking a company's **transactions** and **standing** with its **own shareholders**. That's why we can cover this entire financial statement in just one lecture. There are simply far **fewer** and less varied transactions that companies have with their own shareholders than with their business partners, suppliers and customers. So, this financial statement will typically take up the least space in most companies' financial reports—and, frankly, it is probably the one that investors spend the *least* time analyzing. But, this brief chapter is still important, for at least three reasons.

- **First**, you could argue that a company's transactions with its own shareholders are what the corporation is all about. One view of a corporation is that it is a legal entity which investors create and found by putting in their own money, in the hope and expectation of making a return on their investment. In that view, the corporation's operations are just a mechanism for transforming the shareholders' *Common Stock* investment into future cash distributions (e.g. *Dividends*) to shareholders. And the SSE fully illustrates the beginning and end of that process.

- **Second**, there are a couple of data points that are important for investors that we can **only** get from this statement.

- **Third**, there are a number of current topics of **public conversation and controversy** relating to corporations' relationships with their own shareholders. The

technical knowledge we'll cover in this chapter will allow you to understand those debates.

15.1 Where we stand

15.1.1 What do we know about shareholders' equity so far?

To date, we've learned that Shareholders' Equity (**E**) represents the shareholders' claims on and financing contributions to the corporation, and consists of two components:

1. **Paid-in capital**: amounts that shareholders have literally and directly paid in to the corporation, via the purchase of ***Common Stock*** from the corporation.

2. **Earned capital**: amounts that the shareholders have *earned* (as net income), but *not* paid out to themselves as dividends, represented by ***Retained Earnings***.

In Chapter 1, we expressed that with this **core identity**:

$$Shareholders' \ Equity = Common \ Stock + Retained \ Earnings \tag{15.1}$$

The key journal entry for **paid-in capital**, the issuance of *Common Stock*, was Transaction #1:

Cash (+A):	$15,000	
Common Stock (+S.E.):		$15,000

Issuance of Common Stock, Jan. 2, 2020

And we know the **core identity** for updating *Retained Earnings* between periods:

$$\Delta Retained \ Earnings = Net \ Income - Dividends \tag{15.2}$$

Or, we can update Retained Earnings between periods via the 'Closing Process,' in which we 'close out' the temporary accounts, by fully debiting Revenues, and fully crediting Expenses and Dividends, and placing the balance in Retained Earnings.

	Debit	Credit
Revenues:	$7k	
Salaries Expense:		$2.7k
Supplies Expense:		$.4k
Depreciation Expense:		$.6k
Rent Expense:		$1k
Dividends:		$.1k
Retained Earnings:		$2.2k

'Closing process', update to RE, 1/1/2021

As we noted, the 'closing process' is a fairly ornate way of doing things that we should be able to understand independently: that revenues, expenses, and dividends are measured *over a reporting period*, and so are set back to zero at the end of the reporting period, and the change in Retained Earnings between periods is the Net Income earned minus the Dividends paid out. But some students find the Closing Process useful for visualizing the connection between the world of Income Statement "flow" accounts and Balance Sheet "stock" accounts, a core course theme.

15.1.2 The Statement Itself

One thing we haven't discussed much to date is how the **Statement of Shareholders' Equity** is **presented** in the financial statements. It's fairly self-explanatory, but also a bit different than the Income Statement and Balance Sheet, which can make it a bit jarring on a first encounter. The I/S and B/S list account totals *vertically*. But the Statement of Shareholders' Equity instead lists **individual transactions** with shareholders, as well as Net Income earned and Dividends paid out, on the y-axis, and shows the affected Shareholders' Equity accounts *horizontally* (that is, along the x-axis). For example, based on the Adjusted Trial Balance at the end of Chapter 4 (Table **??**, after the 10 external transactions and 3 adjusting entries), the Statement of Shareholders' Equity would look like this:

	Common Stock	Retained Earnings	Total Shareholder's Equity
Balance, Jan 1, 2020	$0	$0	$0
Issue Common Stock (Tr. #1)	15,000		15,000
Total Dividends Paid		(100)	(100)
Net Income		2,300	2,300
Balance, Dec 31, 2020	**$15,000**	**$2,200**	**$17,200**

Statement of Shareholder's Equity

This is still the **big picture**, the key concepts. But, as usual, that **high-level** overview of Shareholders' Equity left out some details and complications.

15.1.3 What are we missing?

Let's first briefly cover **what** we're missing, before filling in those gaps and details (in subsequent sections).

1. **Legal and institutional background on shares**: So far, we've learned that shareholders invest cash in the company, and receive, in return, *Common Stock* which gives them *ownership*, specifically the right to vote their shares and receive dividends. But we also know that corporations **can issue more shares** at various times, to raise additional financing. So, **where do those shares come from**, what are they, why do companies do that, and are there any restrictions on a company's ability to do so? We need to learn some new terminology and legal details to understand this.

2. **Par value:** In reality, the accounting for **Transaction #1** (the issuance of common stock) is slightly **more complicated** than the above. For historical reasons, shares of stock have something called **'par value'**, which has **no meaningful economic content** today, but which is still accounted for, due to historical and institutional reasons.

3. **Repurchases**: To date, the way in which our corporation has returned cash to shareholders has always been through dividends. But in reality, corporations can a**lso return cash to their shareholders** via an arguably more direct route: **repurchasing shares**. In fact, today, this is the **preferred way** for companies to get cash to their shareholders, and also one that has become a source of political and social **controversy**. We'll discuss why, and also the accounting for repurchases.

4. **Preferred Stock**: To date, we've always talked about *"common"* stock. But there is another category of stock, called 'preferred stock,' that is like a **hybrid of equity and debt**. We'll define what preferred stock is, discuss why it's interesting and controversial, and cover the accounting for it.

5. **Stock Splits**: It is very common for companies to do stock *"splits"*—that is, declare that every 1 share is now 2 shares. After a split, every shareholder's *percentage* ownership is unchanged, and each individual share is essentially worth half as much. So, why do companies do these, and what are the implications?

There are some issues in accounting for shareholders' equity that became very torturous and arguably illogical, often due to the arcana of **par value** (e.g., certain aspects of stock splits and 'stock dividends'). And those items are not very important for

broader understanding. I encourage my introductory and business-major students not to go beyond the topics I cover here.

15.2 Legal and institutional details on shares

If you and I **both have 50 shares** of a corporation, and are the only outstanding shareholders, we usually think that means that we both have **50% ownership**. But we also know that the corporation can **issue more** shares and **repurchase** shares from shareholders. So, how do we make sense of all of this, and understand who has what percentage ownership at any time? This suggests we need some **legal background and terminology**.

1. **'Authorized Stock'**: Corporations have **articles of incorporation**, which are sort of like their corporate **constitution**. A corporation's articles will explicitly state the **total number of shares** that the corporation can issue. We call these the '**authorized shares**.' So, ultimately, all shares are a subcategory of the authorized shares.

2. **'Issued Stock'**: These are all the shares that companies *have at some point issued* (that is, sold to external investors), out of their authorized stock.

3. **'Treasury Stock'**: These are all the shares which the company *had issued*, but which it has **since repurchased** from shareholders. (I discuss *why* companies repurchase shares, below.) After the company repurchases a share, you can think of it as being 'held by the corporation' (as in its treasury). But, since repurchased shares, by definition, no longer belong to outside investors, they **cannot vote and cannot receive dividends**. (It wouldn't make much sense for the corporate legal entity to receive dividends from itself, or vote).

   Many students ask, how does treasury stock—that is, shares, the company issued and then repurchased—*differ* from shares that *were authorized* but never issued? That's a great question. Philosophically, it's not clear how those shares really *are* different in their essence—both are 'held' by the corporation, and therefore do not receive dividends or votes, and can be issued in the future. But ***creating* this distinction** between the two will make some of our accounting more tractable (see below).

4. **'Outstanding Stock'**: These are the shares that have been issued and are *currently* held by outside shareholders—that is, those that are not currently in Treasury Stock. So, these are the only shares that can actually be voted and receive dividends. This is where the real action is. By arithmetic identity, the number of

outstanding shares must equal the number of issued shares minus the treasury stock.

So, to make this concrete, suppose the following:

- Our company's articles authorize 10 shares, numbered #1-10.
- We first sell Common Stock, issuing shares #1-6.
- And then later we repurchase shares #4-6.

Then, after those three stock transactions:

  - The **authorized** shares are all shares, #1-10.
  - The **issued** shares are shares #1-6.
  - The **treasury** stock is shares #4-6.
  - And so the **outstanding** shares are #1-3.

Discussion question: Now, let's go back to our initial question. Suppose that you currently own **40 shares**, there are a total of **100 outstanding shares**, and a total of **200 authorized shares**. Then, what is your percentage ownership—40% or 20%?

That would usually be considered **40%** ownership. If a vote or dividend distribution were held today, you would get 40% of either. That is, conventionally, when we talk about shareholders' percentage ownership, we mean of the **outstanding** stock. But, as always, the real world is **fuzzy**. Suppose that the **other 60** outstanding shares are all owned by **your enemies**. Then, if your enemies ally against you, they could use their **control**—from their 60% majority ownership—to get the corporation to issue the other **100 un-issued shares** to **their friends**. And, presumably, the friends of your enemies are also your enemies. After that dilution, you would then have 20% ownership. So, the reality of *control* is more complicated and *contingent*—it depends on who the other shareholders are, and what constraints they are working with.

15.3 Par value

15.3.1 Background and meaning

The **'Par Value'** of shares is a weird, and somewhat frustrating, **historical artifact**. I call it the **'appendix of the accounting system,'** because it had a role in our evolutionary history, but **now** causes only **irritation** and inflammation.

Here's the story: Back in the old days, there was a fear that 'robber baron'-type corporate **executives** would **enrich themselves** by **issuing extravagant numbers of**

shares and directing the cash into their own **coffers or perquisites**. In response, corporations began adapting corporate charters where they **committed not** to sell shares at below a **stated 'par value.'** This essentially **set a lower bound** on how much the corporate executives could lower the stock price **through issuances** of new shares (though market participants were obviously still free to trade the stock below that value for other reasons). And, many **states** (which set corporate law) adopted laws requiring companies to have such a par value provision in their corporate charters and shares.

Today, we have different, and more effective regulatory and **corporate governance** mechanisms for stopping corporate executives from robbing their own companies via extravagant share issuance. And today, 'par value' has essentially **no 'bite,'** no economic meaning or reality at all. In my career to date, I have never once encountered a case where a stock's par value affected or constrained corporate actions in any meaningful way. It has no **economic significance or meaning.** So, effectively, all it means when we say a stock has a 'par value' of $.01 is just this: 'This stock's registration / certificate has par value of $.01 **written** on it.' Really. **That's it.** Many students are tempted to think that 'par value' represents the 'real' value of the share. Nope. Quite the opposite. Remember that when companies issue Common Stock, they are *selling* it into a *competitive* financial marketplace. So, that **market price**—what the investors actually purchase the shares for and pay in—is the 'real' value on that date, by all of our usual accounting principles.

And, many modern companies have moved toward the more **rational approach**, of issuing **'no par stock.'** But not all. Why? Institutions, regulations, and laws are **sticky**. Many U.S. states adopted provisions requiring that stocks be issued with a stated par value—in other words, banning no-par stock—back in those old days, and have not removed those laws since. As such, companies **comply** with those state laws by registering their shares with par value, but often choose the **lowest possible value, $.01 per share**.

15.3.2 Accounting for par value

And, **accounting is sticky, too**. It turns out that we **elided** a bit when we first covered **Transaction #1**, when we debited *Cash* and credited *Common Stock*. In reality, that is **only how we do it for companies that issue 'no par stock.'**

In **reality**, for companies that issue stock with a stated **'par value,'** we only credit *Common Stock* for the *par value* of the shares, and plug the **remainder** to a new account called **Additional Paid-in Capital (APIC)**. This account is a Shareholders' Equity account, and, unsurprisingly, a part of paid-in capital. But it's tracked and reported separately from the *Common Stock* account.

Example: If our company sells 1,000 shares of common stock with a par value of $.01 per share, for an actual market/sale price of $30 per share, we would account for it like so:

Cash (+A):	$30,000	
Common Stock (+S.E.):		$10
Additional Paid-In Capital (+S.E.):		$29,990

Issuing 1k shares of $.01 par value stock for $30 per share, Jan 2, 2021

Since the corporation sells the 1,000 shares for $30 per share, it receives $30,000 in Cash (+A). The total par value of the shares issued gets credited to Common Stock ($.01/share x 1000 shares); and the **remainder is plugged to APIC.** Note that here, we refer to APIC as a **'plug,'** but, for most modern share issuances, the credit to APIC will **actually be much larger** than the credit to the Common Stock account, since modern corporations' stated par value is typically so low, for the reasons discussed above.

There are two reasons why it's worth learning this detail:

- **First**, while 'par value' itself is economically meaningless, the **distinction between paid-in capital and earned capital** is important, conceptually, and for various practical applications (there are some trading strategies that depend on decomposing shareholders' equity into those two parts). And, so, it's important to know and internalize that, unless a company issues no-par stock, it's paid-in capital will not, in fact, be fully tracked in the *Common Stock* account. A significant fraction of the paid-in capital will be tracked in Additional Paid-in Capital. Modifying our core identity from Chapter 1, we now have:

$$Shareholders' Equity = Paid in Capital + Earned Capital \tag{15.3}$$

$$Paid in Capital = Common Stock + Additional Paid in Capital \tag{15.4}$$

$$Earned Capital = Retained Earnings \tag{15.5}$$

- **Second**, we do get *some* **new information** from this. You may know that stock market analysts and traders are very focused on **'earnings per share' (EPS)** and other **per-share** numbers, because they are ultimately trying to calculate the value of the individual shares that they trade in the stock market. In all of the accounting we've seen to date, we've only talked about the total accounting numbers for the corporation as a whole. **To calculate EPS**, we would divide total earnings by the number of **shares outstanding**. How do we get this number? Well,

if we know the *par value* of the shares, we can now use the Common Stock account to calculate the total number of shares **issued**. (In the example above, it would be \$10/(\$.01/share) = 1000 shares.) Now, **outstanding shares** and **issued shares** are **not the same thing**. So, once the company repurchases shares into its Treasury Stock, the math for calculating outstanding shares won't be so simple anymore. So, calculating EPS is not quite *that* simple, but *par value* gives us *some information* that is relevant toward that.

15.4 Repurchasing shares

15.4.1 Background on repurchases

Companies can and **increasingly** do **repurchase shares** from their shareholders. Why do they do this? This is one way of **getting cash back to their investors**, which, from the investors' / owners' perspective, is largely why they founded and/or invested in the firm in the first place. So, in that respect, they are **just like dividends**—moving cash over a line, from the company's bank account into the shareholders' bank accounts. So, the next question is, why would corporations return cash to shareholders via **repurchases *rather than* dividends**?

There is a **famous theorem in finance** that implies that if a corporation has a choice between returning \$X in cash to shareholders via repurchases vs. returning \$X in cash via dividends, the two have **identical effects on overall shareholder wealth**. How to make sense of this? Here's an intuition:

- **First,** suppose that you buy 1 share out of 100 outstanding shares in a corporation, for \$10 today. Now, suppose that the corporation immediately pays a dividend of \$1 per share (for total cash payout of \$100). Then, you just got a 10% cash return on your investment, via the cash dividend, and you are better off than if the company had buried the cash.

- **Now**, suppose instead that the corporation uses that \$100 to **repurchase shares from *other shareholders***—specifically, 10 shares at the market price of \$10 per share. Do you still benefit? If so, how? **After that repurchase**, there would be fewer outstanding shares, meaning that your share's **share of future dividend distributions would be proportionally higher**. So, that also increases your wealth in a similar way, even if you don't personally participate in the repurchase (relative to the counterfactual of the firm burying the cash).[1] You'll see more formal

[1] In reality, there are lots of complications here about expectations, surprises, how we are defining and measuring returns, etc., which would be a great topic for a **PhD** seminar. For now, I am just trying to convey the intuition for the purposes of this intro course. So, I apologize to my PhD-endowed readers for the technical elisions.

proofs and extension of this idea as you proceed through your finance courses.

So, from the perspective of high-level finance theory, dividends and repurchases are really just the **same thing**—cash flows from the corporate entity, to its owners' bank accounts. So why are companies increasingly choosing repurchases? First, repurchases are often effectively **tax-advantaged** (for the shareholders themselves), for reasons beyond the scope of this course. An interesting benefit for the **firms** is that repurchases effectively give them more **flexibility**, for psychological/sociological reasons. Historically, the stock market has been somewhat **'fixated'** on stocks' **dividend** levels. If a company has been paying a dividend of $1 per share for many years, and then the company **suddenly cuts** that dividend, the markets interpret that as a **bad signal** and sell off steeply (or so it is feared). For psychological/sociological reasons that are beyond the scope of this course, stock markets and traders **don't seem to get so fixated on total annual repurchases** in the same way. So, if a company has excess cash on hand this year, it may be more comfortable **disbursing** that cash **via repurchases**—that way, it doesn't feel **locked in** to paying out that same amount in **future** years as well.

Repurchases, you may know, have become a source of **political controversy** in recent years, with many politicians fearing or arguing that corporations are doing wrong by (some say) 'manipulating' their stock prices through repurchases instead of reinvesting that cash in their growth, their employees, etc. There are a number of tricky issues, and we don't do politics in this class. But, as a **technical matter**, repurchases and dividends are really the same thing, two forms of **shareholder payouts**, just structured differently. So, every argument about repurchases should also apply to dividends and vice versa. My opinion is that there are **specific scenarios** in which we would want certain companies and industries to **reduce shareholder payouts as a whole**—e.g., to reduce *leverage* in the financial sector, per the discussion in Chapter 6. (Note that reducing payouts increases the accumulation of earned capital.) That said, because dividends and repurchases are identical in that respect, it is puzzling why some public figures are specifically focused on *repurchases per se* (and not equally on dividends)—and I tend to view that as a signal that the speaker has not thought very clearly about their policy proposal.

15.4.2 Accounting for repurchases

How do we account for repurchases? *Intuitively*, a repurchase is **'reversing' the prior issuance** of stock. So, it's **tempting** to just **'extinguish'** the Common Stock and APIC credits from that initial issuance (Table **??**). But, that **can't quite work**. Why not? Because the company can—and usually will—repurchase that stock at a different price

than what it initially paid for it. So, if we just 'extinguished' the initial credits, that wouldn't balance with our cash repurchase cost.

So, instead, the **rule for repurchases is**: We debit *Treasury Stock* and credit cash for the full amount of the *repurchase*. So, if a company repurchases 500 shares for $20 each, the journal entry would be:

Treasury Stock (+contra-S.E.):	$10,000	
Cash (-A)		$10,000

Repurchasing 500 shares for $20 each, August 1, 2021

Treasury Stock is a new *account*. It is a contra-Shareholders' Equity account (the first one we have seen). This should make intuitive sense. By repurchasing shares from investors, paying out cash to them, the company is reducing the amount of financing contributed by shareholders. As a contra-Shareholders' Equity account, it has a debit balance, and it decrements the total amount of Shareholders' Equity. In the Shareholders' Equity section of the balance sheet, it is reported as a negative number—indicated with a minus sign or parentheses—reducing the total S.E.

There are three things worth noting about this accounting rule:

- **First,** the fact that we *previously issued* the stock for $30 does not matter—the accounting for the repurchase would be the **same** whatever the **initial issuance price** was. This is counterintuitive and can trip students up.
- **Second**, the **par value**, which had already been credited to *Common Stock*, also does not factor in here. We do not 'reverse' the *Common Stock* credit from previously-issued, now-repurchased stock *at all*. This is counterintuitive. It also means that, after a repurchase, the *Common Stock* account will not *directly* tell us how many shares are *outstanding*—only the total number that have been *issued*.
- **Third**, this means that a company's *repurchases* over a reporting period will be tracked in changes in this account, *Treasury Stock*. So, that's where you would start your research if you wanted to know about a company's activities in this area of controversy.

15.4.3 Discussion: Do they reduce earned capital or paid-in capital?

Here's an interesting 'gestalt shift' question, and possible essay topic: Is *Treasury Stock* a negative component of *Paid-in Capital* or *Earned Capital*? Here are a couple of arguments, based on what we've done so far:

- On the one hand, we said that repurchases are just like *reversals* of *Common Stock* issuances. So, just as *Common Stock* is a positive component of Paid-in Capital, Treasury Stock should be a negative component of it.
- On the other hand, we said that *repurchases are just like dividends*, in a different form: moving cash from the corporate bank account to its shareholders.' And, since Chapter 1, we've seen that dividends are negative contributors to *Retained Earnings* (Earned Capital), by its core identity.

What do you think? What does the official course textbook say? How do most companies report it? Or, does the discussion above suggest that the **distinction** between earned capital and paid-in capital is **not so clean** and absolute?

15.5 Re-selling repurchased stock

In the previous section, we learned that companies can return cash to their shareholders via repurchases, and those repurchased shares are then categorized as part of its *Treasury Stock*. Companies can also **reverse things again, and re-sell those shares**. Why would a company do this? For the **same reason it issued shares originally**—to get cash financing for its growth, investment, etc.

If a company re-sells treasury shares, the **accounting is slightly different** from the initial issuance. In this case, the accounting depends upon *which particular shares* the company is re-selling, and the **price it had repurchased them for** previously. (Obviously, for concrete problems, this information will be provided.)

The rule for accounting for the **re-sale** of Treasury Stock is this: (i.) debit Cash for the proceeds, (ii.) credit *Treasury Stock* for the shares at their **prior repurchase price** (that is, *reverse* those shares' debit to *Treasury Stock*), and (iii.) **'plug' the difference** to *Additional Paid-In Capital* (whether a debit or credit).

15.5.1 Example

Let's continue with the example we used above for the initial repurchase of 500 shares for $20 each. So, now, our company has 500 shares in Treasury Stock. If we were to re-sell 100 of those shares for $30 each, the journal entry would be:

Cash (+A)	$3,000	
Treasury Stock (-contra-S.E.)		$2,000
Additional Paid-in Capital (+S.E.)		$1,000

Re-selling 100 Treasury Shares (purchased for $20) for $30, 12/17/2021

And note that if we **resold** the shares for **less** than we had initially paid for them, the **plug** to *APIC* would have to be a **debit** instead. Test yourself: Suppose those 100 Treasury Shares were instead sold for $10 in this transaction. How would you account for it?

So, that's the rule. There are two important discussion points here.

15.5.2 Why APIC and not a 'gain'/'loss'?

First, note how we *do not* account for this transaction. The company *had* repurchased those shares for $20, and now *re-sells* them for $30. So, many students are *tempted* to think this should be a 'Gain.' If you had purchased an **asset** like *Equipment* for $2k, and re-sold it for $3k later in the day, it **would be**. Further, a 'Gain' would be a credit satisfying the 'plug' we needed in the transaction above, and balancing our accounting. So, **why do we put it in APIC** instead?

Accounting **standard-setters** have declared that companies **cannot book gains by trading in their own stocks**. *Gains* contribute to net income, the bottom line measure of how much value the company has **generated for its shareholders** via its operations. Company **management** has lots of **private information** about next quarter's expected earnings, etc., which could make it **easy** for them to **'buy low and sell high'** from their own shareholders.

But if companies are **buying low and selling high to their shareholders**, the **shareholders** who participate in those transactions are actually **getting hurt**. So, if we allowed companies to book net income on those trades, that could have very problematic implications. Companies that were desperate to meet or beat certain earnings targets would then be tempted to **manipulate information** to exploit their own shareholders—driving down their stock price before buying it, and driving up their stock price before selling it.

And yet, the company has received the extra cash financing, from shareholders, and so that amount must go into Shareholders' Equity, somehow, in order for everything to balance. APIC fits the bill. The **bigger reason** it's valuable to **learn** about this is that there are **in fact** a variety of **other transactions**, more advanced than we will cover in this intro course, that have a similar logic. You will likely see some of these in your future careers. So, this transaction is really about this **general idea**: Transactions that *must* end up on the Balance Sheet, but where we must **'bypass' Net Income**.

15.5.3 Why separate accounts for these three 'reversals'?

At a high level, all the transactions above did above was: (i.) issue common stock, (ii.) reverse that issuance by repurchasing the common stock, and (iii.) reverse that repur-

chase by re-issuing the common stock.

So it *is* frustrating and counter-intuitive that we have three separate rules, three separate set of accounts, for them. Why do it this way? Given that the stock price varies between those three transactions, they could never be simple, total reversals. There would always have to be some kind of 'plug' involved, at some point. There's no way around that. And per the logic above, we can't use 'Gain / Loss.' The particular rules are **not the only imaginable way of doing it**—and let me know if you see a better approach that satisfies all of our accounting goals and constraints. But they are GAAP, and that's what we need to know.

15.6 Preferred Stock

From Chapter 1, we've said that companies can finance themselves via either **equity** or **credit financing**. Equity financing, so far, has been represented by *Common Stock*, and we have seen several liability accounts representing credit financing. Our high-level definition has been:

- 'Credit' financing is when our company gets cash today, and is *contractually obligated* to pay it back in the future. We **have to** pay our creditors back, but they do not get any additional 'upside' beyond our contractual-specified payments.
- 'Equity' financing is when our company gets cash today from those investors, who have no contractual entitlements to cash flows, but become 'owners' (usually with voting rights). As 'residual claimants,' they can claim **whatever is left over**, after credit obligations have been met.

That seemed like a clean distinction. But, as we've seen many times before, the real world is more complicated and fuzzy. **Reductively**, both equity and credit financing are ultimately just **financial contracts**—contracts in which people provide financing to corporations in exchange or *something*. And lawyers and investment bankers and corporations can write up contracts in ever-more complicated ways. One kind of financial contract we haven't discussed yet is ***preferred stock***. Let's first define how it *works*:

Preferred Stock:

- Outside investors give the corporation cash in exchange for *shares* of *Preferred Stock*.
- The preferred stock **contract pre-specifies certain cash distributions** called *preferred dividends*. They are *called* 'dividends,' just as with *Common* Stock, but work a bit different.

- The corporation is ***not*** **unconditionally obligated** to pay those preferred dividends. But, *before* the company can pay regular dividends to Common Stockholders, it must **first pay out** the dividends specified for **preferred** stockholders. (In many preferred stock transactions, the company must also first pay off all preferred dividends "in arrears"—the cumulative sum of what it missed in previous years.)

Restating, our company is not **unconditionally obligated** to pay dividends to *Preferred Stockholders*, but ***conditional on*** wanting to pay out common stockholders, it is.

How do we classify this contract? Is it equity, or debt, using our core finance theory from Chapter 1, and re-stated above? To me, it seems **right in between**. And it turns out that U.S. **GAAP** treats *Preferred Stock* as a form of **equity**, while **IFRS** treats it as a liability.

15.6.1 Accounting for preferred stock

Under GAAP, we account for *Preferred* just like *Common Stock*, just changing the specific name of the stock account. It's that simple. E.g.:

Cash (+A):	$30,000	
Preferred Stock (+S.E.):		$10
Additional Paid-In Capital (+S.E.):		$29,990

Issuing 1k shares of preferred stock, $.01 par value, for $30 per, Jan 3, '21

15.7 Stock Splits and etc.

15.7.1 What?

It's common for companies to engage in **2-for-1 'stock splits.'** This is **just what it sounds like**. Every 1 share is turned into 2 shares. But, since there are now **twice as many** shares, **each individual** share only has **half** as much rights and **value**, in terms of voting power and entitlement to future share of dividends. So, the share price after a split is essentially half as much as what it was immediately beforehand,[2] and each shareholder is left with the same voting power.

[2] As always, things can get a bit more complicated at the graduate level. If a split is interpreted as a *signal* of managerial optimism—for reasons we'll discuss soon—that signaling effect could increase the aggregate valuation.

15.7.2 Why?

As such, stock splits are essentially just **'paper transactions'** with **no real economics**—no real change in value, power, or resources. So, why do companies do them? Even in the 21st century, stocks are mostly traded in **discrete units**. That is, shareholders of record typically buy 5 shares, or 1, but not .25 shares, or 7.37. So, many companies fear that if their stock price goes to a quite high-level—more than, say, $100 each—ordinary 'retail' investors ("mom and pop") will be unable to buy them. This could reduce investor demand for the shares, and thus, in theory, hurt its stock price. Or at least seem undemocratic. So, typically, companies will do a stock split after their stock price has experienced a sharp rise, in order to keep the per-share price in a 'palatable' range. Companies can also do 3-for-1, or 5-for-1 stock splits, which are just what you would expect. For example, Tesla did a 5-for-1 stock split in the summer of 2020, after years of extraordinary stock performance.

15.7.3 Reverse splits and stock dividends

Companies can also do a **reverse stock split**, which is just the opposite, as you would expect, consolidating every 2 shares into 1. Symmetrically, after a 1-for-2 reverse stock split, each stock would be worth essentially twice as much, all else equal. Why do companies do this? As before, sometimes this is about keeping the stock price in a "psychologically palatable" range, after years of rough decline. Investors are used to seeing per-share prices in the $10-$100 range. So, if your stock is trading for $.50 per share, it **looks bad**. Another reason is that some U.S. **stock exchanges** have **listing requirements** related to the stock price. E.g., the New York Stock Exchange will *de-list* companies—-prevent their shares from trading on the NYSE platform—if their per-share stock price falls below $1 per share. This factor adds an **extra element** to reverse stock splits however. For example, suppose that a company is currently trading at $1.50 per share on the NYSE, and the management suddenly decides to do a reverse split. You might reasonably suspect that the management has information that might cause the stock price to drop further in the future, and is trying to get ahead of de-listing.

Finally, companies can also do something called 'stock dividends,' which are essentially just *fractional stock splits*, though with slightly different legal and accounting mechanics. I.e., after a 20% "stock dividend," every 1 share becomes 1.2 shares.

15.7.4 Accounting for these: We don't, in this class

At this point in the chapter, we've covered all the important concepts I want to convey. It turns out that the accounting for stock splits, reverse splits, and 'stock dividends' is quite arcane, gnarly, and, in some cases, seemingly illogical. And, very often, the

difficulties here are created by the mechanics of adjusting 'par value,' the appendix of the accounting system. Since these are largely 'paper transactions,' with limited economic significance, and the accounting is so challenging, I do not cover them in this introductory course, and discourage my students from going further in this topic at this phase.

15.8 The Statement Itself

Now that we've learned about these other accounts and transactions with shareholders, we can also show a more realistic version of the Statement of Shareholders' Equity, relative to the simple one we presented above (Table **??**). We would simply include the **additional Shareholders' Equity accounts** we just learned about (*Preferred Stock*, *APIC*, and *Treasury Stock*), as additions on the 'horizontal' axis, like so:

	Preferred Stock	Common Stock	Additional Paid-in Capital	Retained Earnings	Treasury Stock	Total Shareholder's Equity
Balance, Jan 1st	$0	$0	$0	$0	$0	$0
Issue Common Stock		15,000				15,000
Dividends				(100)		(100)
Net Income				2,300		2,300
Balance, Dec 31st	$0	$15,000	$0	$2,200	$0	**$17,200**

Statement of Shareholder's Equity, FY2020

Note that, in the example we were using above, the company after its first 10 transactions and adjusting entries, we had no-par stock, and no repurchases or preferred. So, those new columns are all zeroes. But triangulating between what we've learned, and this template, you can surely fill in the rest.

16

Statement of Cash Flows

In Chapter 1, we introduced the concept of *accrual accounting*, which we contrasted to simple *cash-basis accounting*. By now, we're accustomed to accrual accounting—we probably just think of it as *accounting, full stop*. But in this chapter, we cover the Statement of Cash Flows, which reports a company's financial performance on a **cash basis**.

16.1 Overview

16.1.1 Why?

Why are we doing this? There are some **good reasons for accrual accounting**. By recognizing revenues when they are **earned** and **matching** expenses, it attempts to measure whether the company is actually **selling above cost and generating value** for its shareholders on an **ongoing basis**, irregardless of the **timing of checks in the mail**.

But there's also been a **dark side to accrual accounting**. Managers can affect their **bottom-line** net income simply by changing their **depreciation assumptions and estimates**. Or, think back to Chapter 7, and all the complex mechanics and unverifiable estimates that go into the *Allowance for Uncollectible Accounts*, and how revisions in that balance affect the *Bad Debt Expense* and, thus, bottom-line *Net Income*. In general, accrual accounting allows some ***scope*** for managers to use their ***discretion and***

estimates to **"massage"** their earnings a bit. And even when managers have **no ill intention**, some of the more **baroque** aspects of accrual accounting (e.g., the *Bad Debt Expense*) may make it **opaque** or distortionary window into the company's operations.

As a result, there is **increasing demand** for companies to report **cash-basis performance measures**. Some investors ***claim*** that they are fed up with accrual accounting and that they prefer to use *Cash Flows from Operations* as their primary **performance measure**, in lieu of *Net Income*, for assessing and valuing companies.[1]

Another reason for reporting performance on a cash basis is that **"cash is king"**—you'll hear this mantra repeated in business settings and used to mean many different things. In this context, what this means is that companies must make their **interest and principal payments to their creditors in cash**. **You cannot pay the bank in receivables.** Only cash. A company could be **highly profitable on an accrual basis** (in terms of net income), but default on its debt payments and go into bankruptcy, if it is **unable to convert its *Accounts Receivable* into cash** in time to pay the bank, or because its expenditures on *Inventory* or other assets (which are not immediately expensed in accrual accounting) **consumed too much cash**. Put differently, if assets like *Accounts Receivable* and *Inventory* are increasing rapidly, a company might report **high net income**, but be **bleeding cash**.

16.1.2 How?

To fill out the Statement of Cash Flows, we **do not** go back through all of the company's thousands or millions of transactions and **re-do** its accounts **from scratch** on a cash basis. Instead, we use the **work we've already done**, the finished **Income Statement** and **Balance Sheet**, to "back out" the **cash component** of the company's performance.

This may remind you of the more theoretical-seeming stuff we covered in Chapter 5. E.g., we showed how differences between *Revenues* and *Cash Collections from Customers* related to **changes** in *Accounts Receivable*. We wrote certain journal entries using an extra zero row, to show how '**differences** between **accrual** revenues / expenses vs. their **related cash** flows are stored in or **plugged** by **changes** in **balance sheet** accounts.' Almost everything we do in this chapter, in filling out the Statement of Cash Flows, will be an extension of that idea.

In practice, the Statement of Cash Flows **decomposes** the **total change in cash** into three different components, each reported in their own section of the statement:

- (1.) Cash Flows from **Operations**,

[1] The question of whether *Net Income* or *Cash Flows from Operations* is a better summary performance measure is extremely important, interesting, complex, and difficult to answer. I can't get into the debate too much here, in this introductory course. But the complexity and importance of this question—and the difficulty of answering it—is a major reason why accounting research professors exist.

- (2.) Cash Flows from **Investing**,

- (3.) Cash Flows from **Financing**.

For most purposes and analyses, Cash Flows from Operations is the most important number—the major alternative, competitor, or complement to *net income* as a measure of the company's performance. And there are **two different methods** for filling out the **operating** section of the cash flow statement:

- The **"direct method,"** in which we **adjust each** individual income-statement line item to its **cash-basis analogue**, one-by-one.

- The **"indirect method,"** in which we instead **start with** *Net Income* and make those adjustments required to go to *Cash Flows from Operations* at a more **summary level**, instead of line by line.

These two methods get you to the same place (**cash flows from operations**), using the same concepts, just with the *adjustments* presented in a different way. The large **majority of companies** report under the **indirect method**. But the **direct method** is better, in my view, at **helping students understand** what's really going on in the cash flow statement. So, I cover it first. Once we do that, the indirect method will be relatively easy. This distinction—direct vs. indirect method—only applies to the **operating section**. For the investing and financing sections, we only use one approach.

So, the remainder of this chapter will proceed as follows.

- **First**, we'll cover the **distinction** between operating, financing, and investing cash flows, the **three sections** of the statement, in greater depth.

- **Second**, we'll cover the **operating section** in detail, showing **both** the direct and indirect methods.

- **Third**, we'll fill out the remaining sections, investing and financing.

16.2 Operating vs. Investing vs. Financing

All cash flow statements decompose the net change in cash into cash flows from operating vs. investing vs. financing activities. So, they'll all have this basic structure:

Operating cash flows:		
...		$...
...	$(...)	
Net Change in Cash From Operations		**$X**
Investing cash flows:		
...		$...
...	$(...)	
Net Change in Cash From Investing	**$(Y)**	
Financing cash flows:		
...		$...
...	$(...)	
Net Change in Cash From Financing		**$Z**
Net Change in Cash Between Periods		**$X-Y+Z**

Statement of Cash Flows, for FY ending 12/31/2021

So, our first order of business is to fully understand what transactions go into which categories. These are **mostly** pretty **intuitive**, but there are a couple of **notable exceptions**, counterintuitive cases, and especially tricky ones that I'll highlight.

- **Cash flows from operations (CFO)**
  - **Big idea**: These are cash flows having to do with the company's normal short-term business operations, the ongoing sale of goods and services to customers.
    - So, **cash collections from customers** count as operational, as do cash **payments of salaries** to workers, cash payments for short-term **supplies, rent**, and other miscellaneous operating expenses, etc.
  - **Tricky and counterintuitive cases**.
    - For the purpose of the **Cash Flow Statement**, cash spent on **interest payments** is categorized as an operating cash flow, even though it has to do with the company's debt financing. This is done to make the operating section of the cash flow statement **more comparable to the income statement** and thus more **useful as a check** on it. Since *Interest Expenses* are on the income statement, we include cash interest payments as operating cash flows.
    - **Cash spent on *Inventory*** is considered operating, not investing, because *Inventory* is a short-term (current) asset. This is potentially confusing for first-time learners (and your professor), because *Inventory* is capitalized as an asset, just like purchases of PP&E, etc., which might seem to connote that it is an investment. But, short-term assets (***current assets***) are categorized as operational. Put differently, there is **not** a 1-to-1 mapping from capitalizing vs. expenseing an expenditure to the investing vs. operating categories.

- **Cash flows from investing**
  - **Big idea:** These are cash flows having to do with the company's **purchase and sale of long-term assets**.
    - So the cash purchase of **Equipment or Land**, or ***another company's* stock or bonds**, would be investing cash **outflows**. And, the **sale** of those same assets would be an investing cash **inflow**. If you think back to Chapter 10, you may recall that we can calculate the **cash sale price** on an asset by triangulating between its **prior book value** and the **gain or loss** upon sale.
  - **Tricky cases:**
    - As above, remember that if a company spends money on an asset, but that asset is a **short-term**, current asset, like *Inventory*, that's considered operational, not investing. And, if a company buys or issues *its own* stock or bonds, that has to do with how it *finances itself*, so that's financing, not investing.
- **Cash flows from financing**
  - **Big idea:** These are cash flows having to do with **how the company finances itself**, its **transactions with its shareholders and financial creditors**.
    - So, the **issuance or repurchase of bonds or common stock**, and the payment of **dividends**, all count as financing cash flows.
  - **Tricky cases:**
    - As we discussed in the **operational** section, we categorize **cash interest payments** as operational, not financial, to make the operating section more comparable to the income statement. Additionally, note that if a company buys *another company's* stocks or bonds, that would be an **investing** cash outflow. Financing cash flows have to do with how our company finances *itself*—i.e., its *own* stocks and bonds.

16.3 Operating Section: Direct method

Under the direct method, we convert each line item in the income statement (that is, each revenue and expense) to its cash-basis analogue, line-by-line. That's it. And, doing this is absolutely feasible, based on what we've learned so far. Why? Because, the differences between accrual-basis revenues and expenses, and their related cash flows,

are 'stored in' changes in the related asset and liability accounts (remember Chapter 5, Section 7.2.3). Let's start by diving into an example, and then back up to the theory and rules, afterwards.

16.3.1 Example

Suppose we are given the Income Statement and Balance Sheets below, and asked to prepare the Operating section under the Direct method, for FY2021. In order to make this tractable for this introductory course, we need to make a **simplifying assumption**, that will be our default throughout this class: Assume that the *Accounts Payable*, below, are all **related to the purchase of *Inventory***.

Revenue:	**$200k**
COGS:	**$80k**
Salaries expenses:	**$40k**
Depreciation expenses:	**$30k**
Loss on sale of land:	**$5k**
Interest expense:	**$10k**
Income tax expense:	**$10k**
Net Income:	**$25k**

MattCorp Income Statement, For the Year Ended December 31, 2021:

	2021	**2020**
Assets:		
Cash	**$230k**	**$220k**
Accounts Receivable	**$90k**	**$70k**
Inventory	**$120k**	**$140k**
Investments	**$130k**	**$0**
Land	**$200k**	**$260k**
Equipment	**$250k**	**$200k**
Accumulated Depreciation	**$(80k)**	**$(50k)**
Total assets:	**$960k**	**$840k**
Liabilities:		
Accounts payable	**$80k**	**$90k**
Salaries payable	**$30k**	**$20k**
Interest payable	**$7k**	**$12k**
Income Tax payable	**$16k**	**$15k**
Notes payable	**$260k**	**$220k**
Shareholders' Equity:		
Common Stock	**$432k**	**$383k**
Retained Earnings	**$135k**	**$120k**
Total Liabilities and S.E.:	**$960k**	**$840k**

MattCorp Balance Sheets, Year Ended December 31:

Where do we start? Under the direct method, we convert each line item of the income statement to its cash-basis analogue. So, **start at the top** of the I/S, with *Revenue*.

16.3.2 Adjusting Revenue to Cash Collections from Customers

The **cash analogue** to accrual-basis *Revenue* is the *"Cash Collected from Customers"*. Our company has reported \$200k in *Revenue* from this period. But we can't be sure it actually collected all of that in cash. This company has **no** *Deferred Revenue*, so that doesn't factor into this analysis. So, we only need to worry about *credit sales* and collections, which are ***stored in*** in changes in *Accounts Receivable*. So, to go from Revenue to Cash Collected from Customers, we'll use the change in *Accounts Receivable (A/R)*. To understand this, consider the following:

- Suppose our company sold \$50k in goods *on account*—then that would count toward *Revenue*, but not *Cash Collected*, and would **increase** *A/R* by \$50k.
- Similarly, suppose our company collected \$40k on **past accounts**, that is, from *Revenue* earned in **previous periods**. Then that would be *Cash Collected*, but wouldn't count toward *Revenue* in this period, and would **reduce** *A/R* by \$40k.

Netting out, and generalizing, we have the following core identity (which holds **assuming no *Deferred Revenue***):

$$Cash\,Collected\ from\,Customers = Revenue - \Delta\,Accounts\,Receivable$$

In the case of our example above, this means that:

$$Cash\,Collected\ from\,Customers\ (FY2021) = \$200k - (\$90k - \$70k)$$

$$Cash\,Collected\ from\,Customers\ (FY2021) = \$200k - (\$20k) = \$180k$$

So, the **top line** of our **Operating Section**, under the Direct Method, will be just that.

In this simple example, we only had one kind of *Revenue*. But suppose that we had *Interest Revenue* as well. In that case, the same the general pattern would hold, but we would use the *Interest Receivable* in lieu of A/R. Additionally, as will *usually* be the case in this introductory course, we had **no** *Deferred Revenue*. But what if the company did have some? Recall that *Deferred Revenues* represent customers' pre-payments—so they *are* cash collected from customers, but have not yet been recorded as accrual-basis *Revenues* (since they have not yet been earned). So, we would make just the opposite adjustment, *adding* changes in *Deferred Revenue*. We can state this as a general rule.

Rule: Under the Direct method, we adjust each *Revenue* to its cash-basis analogue by subtracting the change in the related asset account (the *Receivable*), and adding the change in the related liability account (*Deferred Revenue*) ***if any.***

16.3.3 Adjusting COGS to Cash Paid to Suppliers

Next, going down the Income Statement line-by-line, is *COGS*, the accrual expense from using up *Inventory*. The **cash-basis analogue** to this is *"Cash Paid to Suppliers for Inventory."* Remember that, even though *Inventory* is an asset, it is short-term (**current)**, so purchases of *Inventory* are categorized as *operational*.

Our company reported $80k in *COGS*. And yet, *Inventory* only decreases by $20k over this period ($140k down to $120k). How can this be? By our core identities around **purchases and expenses**, it must be that it **purchased an additional $60k** in *Inventory*. Put more generally, we know that:

$$Asset\ Ending\ Balance = Asset\ Beginning\ Balance + Purchases - Related\ Expense$$

Applied to *Inventory*, we could rewrite this as:

$$Inventory\ Purchases = COGS + \Delta Inventory \tag{16.1}$$

So, is that *Cash Paid to Suppliers for Inventory*? **No, not yet**. While we now know the company *purchased* $60k in *Inventory*, we can't be sure that was all in cash. It could have purchased some *on account*. How do we calculate that? As specified above, for this class, we make a **simplifying assumption** that all *Accounts Payable* are related to the purchase of *Inventory*. This means that the difference between the *Inventory* **purchases** and the **cash payments** to those suppliers will be fully tracked in *Accounts Payable*. Consider the following examples:

- If we purchased $60k of *Inventory*, but only paid for $40k of it in Cash, then those $20k of credit purchases would increase *Accounts Payable*.
- If we paid off **past periods'** *Accounts Payable*, that would be a cash payment to suppliers, but not an expense in this period, and would decrease our *A/P*.

Netting out, and generalizing, we have the following core identity (assuming all *Accounts Payable* are related to the purchase of *Inventory* from suppliers):

$$Cash\ Paid\ For\ Inventory = Inventory\ Purchases - \Delta\, Accounts\ Payable \tag{16.2}$$

Or, consolidating Equations 16.1 and 16.2, we then have:

$$Cash\ Paid\ For\ Inventory = COGS + \Delta Inventory - \Delta\, Accounts\ Payable$$

In the case of our example above, that would be:

$$Cash\ Paid\ For\ Inventory\ FY2021 = \$80k + (\$120k - \$140k) - (\$80k - \$90k) = \$70k$$

These formulas may seem like a lot. But they're just helping us keep track of and formalize a simple idea. If your *Inventory* went up, it must be that your inventory *purchases* exceeded your COGS by that amount. If your *Accounts Payable* went up, it must be that those purchases were not fully paid in cash. That's the idea. The formulas just help us keep track of things on a ***net*** basis. We can also restate what we learned with a general rule:

Rule: Under the Direct method, we adjust each *Expense* to its cash-basis analogue by **adding the change in the related asset and subtracting the change in the related liability** (typically a payable).

16.3.4 Adjusting Salaries Expense to Cash Paid for Salaries

The next line item on the I/S is *Salaries Expenses* of $40k This one will be easy after the work we did on *COGS*. Our general rule is that we *adjust accrual expenses to their cash-basis analogue* using the changes in the related asset and liabilities. Unlike for COGS (Inventory), **there is no related asset account** for *Salaries Expense*. So, we can do the full adjustment using only the liability account, *Salaries Payable*.

- If we incurred $100k of Salaries Expense over the reporting period, but only paid them $80k, that would increase our *Salaries Payable* by $20k.
- If we paid off **past periods'** *Salaries Payable* in cash (that is, paid back our employees what we had owed them), that would be a cash payment to our employees, and would decrease our *Salaries Payable*.

Netting out, and generalizing, we have the following:

$$Cash\ Paid\ for\ Salaries = Salaries\ Expense - \Delta(Salaries\ Payable)$$

In our particular example, that would be:

$$Cash\ Paid\ for\ Salaries\ FY2021 = \$40k - (\$30k - \$20k) = \$40k - \$10k = \$30k$$

For many expenses (not COGS, though), it will be this simple. If there is not a related asset account (that is, if the expenditures from this expense are ***not*** **capitalized**), then the difference between the expense and the cash is fully tracked in the related *Payable*.

16.3.5 Aggregating: Where are we going?

Now that we have some momentum, I want to back up and take stock of where we are right now, and where we are headed. We started out with the *Income Statement*,

and said that we would adjust each individual line item, line-by-line, to its cash-basis analogue. So far, we've made it through the first three lines. That is, we've gone from this:

Revenue:	**$200k**
COGS:	**$80k**
Salaries expenses:	**$40k**

... to this:

Cash Collected from Customers:	**$180k**
Cash paid to suppliers for Inventory:	**$70k**
Cash paid for salaries:	**$30k**

Or, it could be most helpful to visualize the Income Statement line items, the adjustments, and the cash-basis analogues, side-by-side, like so:

I/S Item	I/S Amount	Direct Method Adjustment	Cash Flow Analogue	Cash Flow Amount
Revenue:	$200k	- $\Delta Accounts\ Receivable$	Cash Coll. from Customers	$180k
COGS:	-$80k	+ $\Delta Inventory - \Delta A/P$	Cash Paid to Suppliers	-$70k
Salaries Expenses:	-$40k	- $\Delta Salaries\ Payable$	Cash Paid for Salaries	-$30k

Showing Income Statement, Direct Adjustments, and Cash-Basis Analogues

The remainder of our work will be to just...keep moving, all the way down.

16.3.6 Skip over Depreciation Expense: Why?

The next item on the Income Statement is *Depreciation Expense*. What do we do with it? **Nothing: We skip over this one.** Our goal is to adjust each line item of the I/S to its operating cash flow equivalent. There **is no operating cash flow related to *Depreciation***. It is, by definition, an ***allocation*** of the net cash outflow from investments in **long-term tangible assets**. The actual cash flows from the purchase and sale / disposal of long-term assets will all show up in the **investing section** of the cash flow statement.

16.3.7 Skip over Gains / Losses on Sales: Why?

Next on the I/S is *Loss on Sale of Land*. What do we do? Once again: **We skip over it.** Why? If you consult **YouTube accounting instructors**, many of them will claim that this is because 'Gains' and 'Losses' are simply accounting plugs, not 'real' cash flows. But this is not correct. Indeed, selling *Land* for cash obviously *does* yield a real cash flow—and the *Gain or Loss* is a part of that overall purchase price. (Since

$Gain\ (Loss)\ upon\ Sale = Sale\ Price - Book\ Value$.) The **actual reason** we skip over it for now is that that cash flow, from selling the asset, is part of the **investing section** of the cash flow statement, not operating. It will *implicitly* show up there.[2]

16.3.8 Adjusting Interest Expense to Cash Paid for Interest

The last two items are easy: In the case of both *Interest Expense* and *Tax Expense*, there is no related asset account, and so we can adjust both of them back to their cash payment analogue using only the change in their related liabilities, their *Payables*. Consider *Interest* first:

- If we incurred \$100k of *Interest Expense* over the reporting period, but only paid \$80k, that would increase our *Interest Payable* by \$20k.
- If we paid off **past periods'** accrued interest in cash, that would be a cash payment, but **not** an *Interest Expense* in **this period**, and would decrease our *Interest Payable*.

Netting out, and generalizing, we have the following:

$$Cash\ Paid\ for\ Interest = Interest\ Expense - \Delta(Interest\ Payable)$$

In this case, that's:

$$Cash\ Paid\ for\ Interest\ = \$10k - (\$7k - \$12k) = \$10k + \$5k = \$15k \tag{16.3}$$

16.3.9 Adjusting *Income Tax Expense* to Cash Paid for Taxes

Once again, for *Income Tax Expense*, there is no related asset account, and so we can adjust it back to the related cash payment using only the change in the related liability, *Income Tax Payable*.

- If we incurred \$100k of *Tax Expense* over the reporting period, but only paid \$80k, that would increase our *Tax Payable* by \$20k.

[2] But, note that there is some dissonance here. Earlier, we learned that companies count **cash interest payments** as operating cash flows to make the operating section more **consistent** with the income statement. But here, gains and losses affect the income statement, but are excluded form the operating section of the cash flow statement. In the case of *Gains* and *Losses*, these are usually "one-time," "special items." We **do not** expect *Gains* and *Losses* from large asset sales and impairments to be *persistent and repeatable*. So, this inconsistency doesn't make the two measures, **CFO vs. NI**, incomparable on a regular basis. However, *Depreciation* and *Amortization* **are** persistent and repeated. Put differently, the *Income Statement* allocates the investing cash outflow as an expense over time, but we don't do the same for *Operating Cash Flows*. So there's some inconsistency there; and, as a result, NI should exceed CFO over the life of a company. It's not clear how else to deal with this issue, however. What this means is that, as always, analysts can't just use one measure to tell them everything they need to know. They need to use the full mosaic of information, from all the firms' disclosures, and analyze them holistically.

- If we paid off **past periods'** *Tax Payable* in cash (back taxes), that would be a cash payment, but not an *Tax Expense* in this period, and would decrease our *Tax Payable*.

Netting out, and generalizing, we have the following:

$$Cash\ Paid\ for\ Income\ Tax = Income\ Tax\ Expense - \Delta(Tax\ Payable)$$

In this case, that's:

$$Cash\ Paid\ for\ Income\ Tax = \$10k - (\$16k - \$15k) = \$9k \tag{16.4}$$

16.3.10 Entire Operating Section under Direct Method

So now, we've adjusted each and every income-statement line item. Next up is to just consolidate all of that work, and net out the cash flows, to calculate and report the **Operating Section**, and its **'bottom line,'** ***Net Cash Flows from Operation***.

Cash Collected from Customers:	**$180k**
Cash paid to suppliers for Inv.:	**$70k**
Cash paid for salaries:	**$30k**
Cash paid for interest:	**$15k**
Cash paid for income taxes:	**$9k**
Net Cash Flows from Operations:	**$56k**

MattCo Operating Section (Direct Method), FY ending Dec. 31, 2021

Finally, it could be useful to once again show this in a wide table like this, with the I/S items, the adjustments, and the cash-flow analogue all lined up:

I/S Item	**Amount**	**Direct Method Adjustment**	**Cash Flow Analogue**	**Amount**
Revenue:	$200k	- $\Delta Accounts\ Receivable$	Cash Coll. from Customers	$180k
COGS:	-$80k	+ $\Delta Inventory - \Delta A/P$	Cash Paid to Suppliers	-$70k
Salaries Expenses:	-$40k	- $\Delta Salaries\ Payable$	Cash Paid for Salaries	-$30k
Depreciation Expenses:	-$30k	Skip Over	None	None
Loss on sale of land:	-$5k	Skip Over	None	None
Interest Expense:	-$10k	- $\Delta Interest\ Payable$	Cash Paid for Interest	-$15k
Income Tax Expense:	-$10k	- $\Delta Tax\ Payable$	Cash Paid for Tax	- $9k
Net Income:	$25k	(All of the above)	**Net Cash from Operations**	$56k

Showing Income Statement, Direct Adjustment, and Cash-Basis Analogue

16.3.11 Summarizing: Three Rules

In the above, I discussed the intuition and logic of each adjustment in some detail. But, it turns out that we can boil all of that work down to just **three rules**. You may

have noticed this pattern yourself:

- **Rule #1:** Adjust each **Revenue** to its cash-basis equivalent by *subtracting* the change in its related non-cash asset account (*Receivables*), *adding* the change in its related liability account (e.g., *Deferred Revenue*), if any.
- **Rule #2:** Adjust each **Expense** to its cash-basis equivalent, by doing **the opposite**, ***adding*** the change in the related asset account, if any (e.g., *Inventory* for COGS), and subtracting the change in the related liability account (typically a *Payable*).
- **Rule #3: Skip** over *Depreciation* and *Amortization*, as well as *Gains* and *Losses*, because the related cash flows are in the **Investing** section, not **Operating**.

You could boil that down even further, if you liked, given the symmetry in Rules #1 and #2. Expenses are just anti-Revenues, so it's intuitive that they have opposite rules for adjustments with their related asset and liability accounts.

After all the work we did understanding each adjustment in the direct method in detail, the *Indirect Method* will just require some **mental rotation**, and then it will be a cinch.

16.4 Operating Section: The Indirect Method

The Indirect Method is just a **different method** for filling out the **operating section** of the cash flow statement. It gets us to the exact same 'bottom line' of that section—Net Cash Flows from Operations. We use **the exact same concepts**, and, moreover, **we make the exact same adjustments** as we did in the Direct Method above. But we simply make those adjustments in a **different** way and **presentation**.

Per the name, under the Indirect Method, instead of adjusting each I/S line-item directly, one-by-one, we **start with** *Net Income*, and **apply the adjustments** required to go to *Net Cash Flows from Operations* at a more summary level. That is, we *apply the adjustments* to go between those numbers, instead of **directly** adjusting each line item. So, in broad outline, it will look something like this:

Net Income (NI):	**$25k**
...adjustments to reconcile NI to CFO	
...	$...
...	$(...)
Net change in cash from operations (CFO):	$56k

MattCo Operating Section (Indirect Method), FY ending Dec. 31, 202

Using what we learned from the Direct Method, we can do the Indirect Method just by making **two key mental rotations**:

- **Mental Rotation #1:** Because the Indirect Method **starts with** *Net Income*, and since *Depreciation* and *Amortization* and *Gains* and *Losses* have **already** been taken out of *Net Income*, we have to **back them out** (instead of skipping over them).

  - I imagine the "ghost of the Income Statement" above.

- **Mental Rotation #2:** Under the *Direct Method*, we had adjusted each individual *Expense* item to the actual cash paid. So, for each **expense line item**, we added the change in the related asset (purchases), and subtracted the change in the related liability (payables, unpaid expenses). But then, in calculating *Net Cash Flows from Operations*, we ultimately **subtracted the "Cash Paid for X" that resulted from those calculations**.

  In the **indirect method**, we just apply the adjustments themselves at a summary level, to go *from* Net Income to *Cash Flows From Operations*. So, instead of **adding (vs. subtracting) changes in related assets (vs. liabilities) to calculate "Cash Paid for X," and *then subtracting* that quantity—we instead just 'flip the sign' and directly subtract (vs. add) the changes in the related asset (vs. liability).**

  - This is a *mouthful*—a lot to hold in the brain at once. But it is the key insight reconciling the two approaches.

  - As a concrete example, in the *Direct* method, *Inventory purchases* add to the calculation of *Cash Paid to Supplies*, but that number is ultimately **subtracted** in calculating **Net Cash Flows From Operations** (CFO). So, we first add $\Delta Inventory$, and then subtract it. In the *Indirect Method*, since we are just entering the adjustments themselves (not line-by-line), we just go right ahead and subtract $\Delta Inventory$.

16.4.1 Example

This will become clearer once we dive in to an example. Let's fill out a Cash Flow Statement using the Indirect Method, using the same example we used last time. I reproduce the same Income statement and Balance Sheet below:

Revenue:	**$200k**
COGS:	**$80k**
Salaries expenses:	**$40k**
Depreciation expenses:	**$30k**
Loss on sale of land:	**$5k**
Interest expense:	**$10k**
Income tax expense:	**$10k**
Net Income:	**$25k**

MattCorp Income Statement, For the Year Ended December 31, 2021:

	2021	**2020**
Assets:		
Cash	**$230k**	**$220k**
Accounts Receivable	**$90k**	**$70k**
Inventory	**$120k**	**$140k**
Investments	**$130k**	**$0**
Land	**$200k**	**$260k**
Equipment	**$250k**	**$200k**
Accumulated Depreciation	**$(80k)**	**$(50k)**
Total assets:	**$960k**	**$840k**
Liabilities:		
Accounts payable	**$80k**	**$90k**
Salaries payable	**$30k**	**$20k**
Interest payable	**$7k**	**$12k**
Income Tax payable	**$16k**	**$15k**
Notes payable	**$260k**	**$220k**
Shareholders' Equity:		
Common Stock	**$432k**	**$383k**
Retained Earnings	**$135k**	**$120k**
Total Liabilities and S.E.:	**$960k**	**$840k**

MattCorp Balance Sheets, Year Ended December 31:

Let me shortcut to **the answer**, and then explain what's going on. Under the indirect method, the **Cash Flow Statement** would look like this:

Net Income (NI):	**$25k**
...adjustments to reconcile NI to CFO	
+ Depreciation Expense	$30k
+ Loss on Sale of Land	$5k
- Δ*Accounts Receivable*	($20k)
- Δ*Inventory*	$20k
+ Δ*Accounts Payable*	($10k)
+ Δ*Salaries Payable*	$10k
+ Δ*Interest Payable*	($5k)
+ Δ*Income Tax Payable*	$1k
Net change in cash from operations (CFO):	$56k

MattCorp Operating Section (Indirect Method), FY ending Dec. 31, 2021

If you look and think carefully, you'll be able to see that these are the **exact same adjustments** we made under the *Direct Method*, just with those two **mental rotations**.

- **First**, we **added back** *Depreciation* and the *Loss*. We add these back because they are not operating cash flows, but they were *already* taken out of *Net Income*. (Symmetrically, we would subtract out a *Gain*.) This is the analogue to "skipping over" these items in the **direct method**. **(Mental Rotation #1.)**.

- **Second**, **everything else** is the same adjustments we made in the Direct Method, just with the **expense adjustments 'flipped'** up front. **(Mental rotation #2.)** (Note that we don't need to 'flip' the adjustment we made to *Revenue*, since *Cash Collections from Customers* **was not** subtracted in the Direct Method.)

  This means that for the **Indirect Method**, we have **just one rule** for all of the current asset and liability adjustments: We **subtract changes in current assets** (other than cash itself) and **add** changes in **current liabilities**. You may recall from Chapter 5 that a company's current asset and liability accounts are called its **"working capital."**

16.4.2 Comparing Direct and Indirect Methods

To make this ultra clear, let me show the Indirect Method, and the table tracking the adjustments we made under the Direct Method again, so you can compare them side-by-side:

Net Income (NI):	**$25k**
...adjustments to reconcile NI to CFO	
+ Depreciation Expense	$30k
+ Loss on Sale of Land	$5k
- Δ*Accounts Receivable*	($20k)
- Δ*Inventory*	$20k
+ Δ*Accounts Payable*	($10k)
+ Δ*Salaries Payable*	$10k
+ Δ*Interest Payable*	($5k)
+ Δ*Income Tax Payable*	$1k
Net change in cash from operations (CFO):	$56k

MattCo Operating Section (Indirect Method), FY ending Dec. 31, 202

I/S Item	**I/S Amount**	**Direct Method Adjustment**	**Cash Flow Analogue**	**Cash Flow Amount**
Revenue:	$200k	- Δ*Accounts Receivable*	Cash Coll. from Customers	$180k
COGS:	-$80k	+ $\Delta Inventory - \Delta A/P$	Cash Paid to Suppliers	-$70k
Salaries Expenses:	-$40k	- Δ*Salaries Payable*	Cash Paid for Salaries	-$30k
Depreciation Expenses:	-$30k	Skip Over	None	None
Loss on sale of land:	-$5k	Skip Over	None	None
Interest Expense:	-$10k	- Δ*Interest Payable*	Cash Paid for Interest	-$15k
Income Tax Expense:	-$10k	- Δ*Income Tax Payable*	Cash Paid for Tax	- $9k
Net Income:	$25k	(All of the above)	**Net Cash from Operations**	$56k

Showing Income Statement, Direct Adjustments, and Cash-Basis Analogues

As you can see, these are the **same adjustments**, just factored in in a different way, which we can **understand** with those **two mental rotations**.

16.4.3 Boiling The Indirect Method Down to Just Two Rules:

So, that's how to **understand** the Indirect Method. To implement it, you can essentially boil it all down to **just two rules**.

Net Income (NI):	**$25k**
...adjustments to reconcile NI to CFO	
+ Depreciation Expense	$30k
+ Loss on Sale of Land	$5k
- Δ*Accounts Receivable*	($20k)
- Δ*Inventory*	$20k
+ Δ*Accounts Payable*	($10k)
+ Δ*Salaries Payable*	$10k
+ Δ*Interest Payable*	($5k)
+ Δ*Income Tax Payable*	$1k
Net change in cash from operations (CFO):	$56k

MattCorp Operating Section (Indirect Method), FY ending Dec. 31, 2021

- **Rule #1: "Back out"** the non-cash / non-operating items from the Income Statement: *Depreciation* and *Amortization* and *Losses* and *Gains.*

  - This means *adding* D&A and *Losses*, and subtracting *Gains*.

- **Rule #2:** Everything else is a **working capital adjustment**:
  - **Subtract** the changes in non-cash **current assets** (like *Inventory* and *A/R*)
  - **Add** the changes in **current liabilities** (mostly *Payables*).

That's it. That algorithm will allow you to fill out the operating section correctly under the indirect method.

If you feel confident with this, you could skip the next three subsections. In those subsections, I just **re-explain things verbally**, using concrete examples. There's no new content or rules. It's just extra verbal scaffolding to help you visualize and build intuition and confidence.

16.4.4 Explaining 'noncash item' adjustments: Depreciation and Amortization

Depreciation Expense is an expense that is deducted from *Net Income*. But it is not a real operating cash outflow. Instead, it is the accounting **allocation** of the cash outflow from **investing in a long-term tangible asset**, by definition. So there **is no** operating-cash-flow analogue. But, since it has already been *implicitly deducted* from Net Income, in making our way back to CFO, we have to add it back. The same logic would apply to *Amortization Expense*, if our company had one. (Again, I imagine the 'ghost of the Income Statement' *above* the Statement of Cash Flows, with *Net Income* at its bottom, linking the two.)

I am told that a **common business-job interview question**, designed to test if students really grasp accounting is: 'Given that *Depreciation Expense* is added in the cash flow statement, can companies increase their cash flows from operations by increasing their depreciation assumptions?' You should now have a confident, solid answer to this question.

16.4.5 Explaining 'nonoperating item' adjustments: Gains and Losses

Losses behave just like an expense, and are deducted from *Net Income*. And, in the indirect method, we similarly "back out" the *Loss* by adding it back, en route to CFO. (Similarly, we would have subtracted a *Gain*.) Many people—including many second-rate **YouTube** accounting instructors—will ***say*** something like, "Just like Depreciation, Gains and Losses are also not *real* cash flows—they are just 'plugs' realized upon sales of assets."

But, if you think carefully, this is not correct. And understanding why will prove important later on. What is a Gain? A Gain on sale occurs when the company sells an

asset for more than its book value. Earlier in the class, we might have written it this way:

$$Gain\ (or\ -\ Loss) = Sale\ Price - Book\ Value\ of\ Asset$$

Another way of writing this is:

$$Sale\ Price = Book\ Value\ of\ Asset\ +\ Gain\ (or\ -\ Loss)$$

So, the *Gain* or *Loss* actually really *is* a **part of the real cash flow** from the sale of the asset. So, why do we back them out? The real reason is that, right now, we are focused on the **operating section of the cash flow statement**. And cash yielded from the sale of assets falls into the **Investing** category. *Gains and Losses* from sales of assets *will* figure into **that section**—and this is one reason why getting the logic correct *does matter*.

16.4.6 Explaining everything else: working capital adjustments

Every single other adjustment under the indirect method is based on changes in current assets and current liabilities (**"working capital"**), and follows just one rule: **Subtract** the change in current (non-cash) **assets**, and, symmetrically, **add** the change in current **liabilities**. We've already built and stated that rule a couple of times now. But this is hard stuff to grasp the first time around. So here are some concrete examples to help you visualize and build intuition:

- If *Accounts Receivable* **increased**, that means that the company made a credit sale, which means it recognized *Revenue* (which goes into *Net Income*) that wasn't collected in cash. So to go back **from** *Net Income* (NI) toward *Cash Flows From Operations* (CFO), we subtract out that increase.

- If *Accounts Receivable* **decreased**, it's just the opposite: That means we collected cash on prior accounts, but that wasn't recognized as revenue in this period. So, to go from NI to CFO, we add that decrease back.

  - Generalizing and netting: To subtract the increases and add the decreases in A/R, we just **subtract the net change** between periods.

- If a current asset like *Inventory* (or *Supplies*) increased, that means the company **purchased** that asset, **but capitalized** that expenditure as an asset, so it was **not** recognized as an **expense**. But purchases of *Inventory* and *Supplies* **are** considered operating cash flows. So, to move from NI toward CFO, we subtract out that increase, just like with A/R. (If the company made that purchase on account, that will be taken care of with our adjustments for payables, below.)

- If a current asset like *Inventory* decreased, it's just the opposite: That means that the asset was 'expensed out' (via *COGS* in the case of *Inventory*), even though the actual cash purchase had been made in the past. So, to go from NI toward CFO, we add that decrease back.

  - Generalizing and netting: To subtract the increases and add the decreases in these **current assets**, we just **subtract the net change** between periods.

For **current liabilities**, the logic is symmetric. These are usually easy, because nearly all current liabilities are just forms of *Payables*.

- If *Salaries Payable* increased, that would mean that we incurred *Salaries Expense* that we haven't yet paid in cash. Since *Salaries Expense* is already deducted from NI, to go from NI to CFO, we need to **add back the increase** in *Salaries Payable*.

- Symmetrically, if *Salaries Payable* decreased, then that would mean we paid down past payables in cash, related to expenses had been recognized in previous periods (that is, not deducted from this period's NI). So, to go from NI to CFO, we need to **subtract that decrease**.

  - Generalizing and netting: To add the increases and subtract the decreases in *Salaries Payable*, we just **add the net change** between periods.

- The exact same logic applies to all Payables: *Interest Payable, Income Tax Payable, Accounts Payable*, etc. If a *Payable* increases, that indicates an accrual *Expense* that **was not paid in cash**—so we need to add it back in going from NI to CFO.

- If a *Payable* decreases, that indicates it was **paid down**—but the payment of **past periods' expenses** is not an expense in this period. So that payment was a cash outflow, but had not been deducted from NI. So, to go from NI to CFO, we need to **subtract that decrease**.

  - Generalizing and netting: To add the increases and subtract the decreases in all *Payables* and other **current liabilities**, we just **add the net change**.

16.5 Investing section:

The **operating section** is the main meat of the cash flow statement. But the other sections are still non-trivial, both in difficulty and importance. We'll now proceed to the **investing** section. (Remember that the distinction between the indirect and direct method does not apply here—that distinction is only for the operating section.)

Investing activities are, by definition, about the **purchase and sale of long-term assets**. So, let's start by **literally looking at** the long-term assets on the company's Balance Sheet, and using our accounting knowledge to figure out what must have happened. In the interest of space, I include just *that section* of the Balance Sheet below:

	FY2021	**FY2020**
Assets:		
Cash	$230k	$220k
Accounts Receivable	$90k	$70k
Inventory	$120k	$140k
Investments	$130k	$0
Land	$200k	$260k
Equipment	$250k	$200k
Accumulated Depreciation	($80k)	($50k)
Total Assets:	**$960k**	**$840k**

MattCorp Balance Sheets, Asset Section

MattCorp only has three long-term assets—**Investments, Land, and Equipment**—so our work will be fairly easy. A **major risk** in filling out this section is **overthinking it**.

16.5.1 Investments

Start with **Investments**. That account *was* $0, but rose to $130k in 2021. So, what must have happened? From Chapter 2, we learned that **assets go up with purchases—at the purchase price**. It would be quite unusual for a company to incur a short-term payable for a long-term asset. Usually, if a company needed to finance a long-term asset purchase, it would get a loan from a *bank*, which would be a financing cash flow. There are exceptions to this—but, in those cases, we'll be told explicitly. So, if we're **not told otherwise**, we can **assume that purchases of long-term assets are in cash**. (We can also assume there was not any fair-value revaluation or impairment of these *Investments*, since there is only one *Loss*, and that is explicitly tied to the sale of the *Land*.) So, in short, we can assume that MattCorp **spent $130k** to purchase those *Investments*, an investing cash **outflow**.

16.5.2 Land

Between 2020 and 2021, the company's *Land* account went down by $60k. What happened? We know there are **three things that make assets go down**:

- (i.) the expense from 'using them up'
- (ii.) sale / disposal
- (iii.) impairments.

We learned in Chapter 10 that we **do not depreciate *Land***. We also know that this Land was not *impaired*, since the only *Loss* in this case was **not** an impairment.

So, by process of elimination, this means that we now know that this company **sold off *Land* that had a book value of $60k**. But was that the **sale price, the cash flow we're interested in? No.** $60k is the prior book value of the Land, and the sale price is a negotiated market price that can be higher or lower. The Income Statement indicates a ***Loss* from the sale of *Land*** of $5k. If the company sold land with a book value of $60k, and incurred a loss of $5k, that means the actual **sale price** was $55k.

Earlier in the course we learned that Gains and Losses on sales 'plug' the difference between the book value of the asset and the sale price.

$$Gain\ (Loss) = Sale\ Price - Book\ Value$$

Rearranging, this means that we can calculate the **Sale Price** using the prior book value of the asset sold, and the gain (loss) upon sale.

$$Sale\ Price = Book\ Value + Gain\ (Loss) = \$60k - \$5k = \$55k$$

Note also that here, in the **investing** section, is where *Gains and Losses* **ultimately end up**, after they were **backed out** of the **operating** section. This is why it was important to get the logic there correct.

16.5.3 Equipment

Finally, *Equipment* went up from $200k to $250k. As before, if a long-term asset account goes up, that means there was **purchase** debited to that account—and, unless we are told otherwise, we can default to the assumption that it was in cash. Do we need to worry about anything else here? Backing up, we know that, overall, there are **four things** that can change a long-term asset balance:

- (i.) purchases,
- (ii.) the expense from 'using them up',
- (iii.) sale / disposal,
- (iv.) impairments.

Do we need to **worry** about any of the **others** here? In this case, **no**. The reason is that there are no other *Losses* or *Gains* so we know there was no *Impairment* or sales of *Equipment*. And, since this company reports **separate accounts for Equipment vs. its Accumulated Depreciation** (rather than reporting *Equipment* at book value), this means that the *Equipment* account *per se* is unaffected by the *Depreciation Expenses* charged. (Much earlier in the course, I told you that contra-accounts would, despite their initial tortuousness, end up making our lives easier. This is one such case.) So, this means that we don't need to overthink this one, and can **directly infer** that the company **purchased $50k in *Equipment***.

16.5.4 Consolidating

There are no other long-term asset accounts, so nothing to indicate any other investing cash flows. So, the final step is just to pull it together, and net out the total investing cash flows:

Investing Cash Flows	
Purchase of Investments	$(130k)
Cash from Sale of Land	$55k
Purchase of Equipment	$(50k)
Net Cash Flows from Investing	**$(125k)**

MattCorp Cash Flow Statement, Investing Section, FY 2021

16.5.5 Boiling Down to Rules: Investing Section

Based off of the above, we could boil the **Investing** section down to this:

- **#1**: *Look at* long-term asset accounts on the Balance Sheet.
- **#2**: If a long-term asset has **increased**, that indicates a **purchase**. Assets are **written up** at their purchase price, and we can assume it was a **cash transaction, by default**.
- **#3**: If a long-term asset has **decreased** and that is not accounted for by the associated expense (e.g., *Equipment* decreasing for a company that tracks *Accumulated Depreciation* separately) or an impairment, that indicates a **sale**.
- **#4**: We can infer the **cash sale price** of long-term assets by triangulating between their **prior book value** and the *Gain* or *Loss* reported on the Income Statement.
- **#5**: When it's **complicated** (i.e., there is an *Impairment*, or *Equipment* is reported at book value), **slow down** and use your knowledge, like a **detective**.

16.6 Financing section

The next and **final section** of the cash flow statement is the **financing section**. Broadly, this section tracks and nets the cash flows related to **how the company finances itself**—transactions in its own stock and debt (with the notable exception that interest payments on debt are categorized as operational, to make the operating section more comparable to the Income Statement).

The company's major transactions in its bonds and stocks will be reflected in the **long-term liabilities** and **Shareholders' Equity** sections of the **Balance Sheet**. So, once again, let's start by **literally looking there**. There will be one very **important thing to remember at the end**—but *looking* will get us most of the way there. See the *Liabilities* and *Shareholders' Equity* sections of the Balance Sheet from the original problem below:

	FY2021	**FY2020**
Liabilities:		
Accounts payable	$80k	$90k
Salaries payable	$30k	$20k
Interest payable	$7k	$12k
Income tax payable	$16k	$15k
Bonds payable	$260k	$220k
Stockholders Equity:		
Common Stock	$432k	$383k
Retained Earnings	$135k	$120k
Total Liabilities and S.E.:	**$960k**	**$860k**

MattCorp Balance Sheets, FYs ending Dec 31, LT Liabilities and Shareholders' Equity Sections excerpted

The **first four** liability accounts are all **current** liability accounts related to short-term, operating cash flows. We already accounted for these in the operating-cash flow section. So, the only liability we need to worry about in this section of the problem is *Bonds Payable*.

16.6.1 Bonds Payable

Since there is **no** *Discount or Premium on Bonds Payable* account, this means that these bonds were issued *at par*. (And we will always **make that simplifying assumption** in this section of this introductory course.) Since the *Bonds Payable (L)* account went up by $40k, and is *at par*, that means that our company must have received $40k in cash from the issuance of a bond. We have no reason or information to believe any old

Bonds were called or repurchased. So, we can infer that this company issued $40k in bonds at par, a **financing cash inflow of $40k**, in this year.

16.6.2 Common Stock

Next, this company has a *Common Stock* account, but ***no*** *Additional Paid-in Capital* account. That means that this company issues **no par stock**, and the cash proceeds from issuing shares is fully credited to the *Common Stock* account. From 2020 to 2021, the *Common Stock* account went up by $49k. This directly indicates that the company got a **$49k cash inflow** from the sale of *Common Stock*. Do we need to worry about *repurchases*? This company has **no *Treasury Stock*** account, indicating that it has not yet engaged in any.

16.6.3 The Key Final Financing Cash Flow: Remember Dividends

Are we **done** here? **Not quite.** We've ***looked at*** all the long-term liabilities and Shareholders' Equity accounts on the Balance Sheet. But there is one key **financing cash flow** that is **not *directly*** tracked here: ***Dividends***. We know that companies pay *Dividends*, that it's an important financing cash flow. But *Dividends*, as we learned from Chapter 1, are not *Expenses*, so they are not reported in the Income Statement. And the are a temporary account, so they are not reported on the Balance Sheet. So, we won't **see *Dividends* anywhere**. But we do have **enough information to infer** what our company paid. Remember that:

$$\Delta \textit{ Retained Earnings} = \textit{Net income earned in period} - \textit{Dividend paid out in period}$$

On our two Balance Sheets, we are told that *Retained Earnings* increased by $15k (from $120k in FY2020 to $135k in FY2021). And, as reported on the Income Statement, the company earned $25k in Net Income during the period. This means that the company **must have paid out $10k in *Dividends***. Or, if you want a **general formula**, we can rearrange the identity above like so:

$$\textit{Dividends Paid out in Period} = \textit{Net Income} - \Delta \textit{ Retained Earnings}$$

So, pulling that all together, our financing section would look like this:

Financing Cash Flows	
Issuance of Bonds	$40k
Issuance of Common Stock	$49k
Dividends Paid Out	$(10k)
Net Cash Flows from Financing	**$79k**

MattCorp Cash Flow Statement, FY '21, Financing Section

16.6.4 Boiling Down to Rules: Financing Section

Based off of the above, we could boil the **Financing** section down to this:

- **#1**: *Look at* the long-term liability and Shareholders' Equity accounts on the B/S.
- **#2**: If *Bonds Payable* or *Common Stock*, etc., has *increased*, that indicates a financing **cash inflow** for the company.
- **#3**: If *Bonds Payable* has decreased that indicates a repurchase or call, or paying off face value at maturity. If *Treasury Stock*, has *increased*, that indicates a stock repurchase. Both are financing **cash outflows.**
- **#4**: **Remember to think about *Dividends*,** a key financing **cash outflow**. They are not *reported* anywhere on the B/S or I/S. But you can infer them using the **Retained Earnings identity**.
- **#5**: When it's more **complicated**, **slow down** and be a **detective**.

16.7 Consolidating the Three Sections:

The last thing we do is consolidate the three sections together, ***net*** the **net change in cash** in each category, and check that it equals the change in cash on the Balance Sheet. The change in cash from this calculation is $10k, which is the same change we see inspecting the Balance Sheets. So, I can sigh with relief: I probably got this problem right.

Operating cash flows:	
Net Income:	**$25k**
... adjustments to reconcile NI to CFO	
+ Depreciation Expense	$30k
+ Loss on Sale of Land	$5k
- $\Delta AccountsReceivable$	($20k)
- $\Delta Inventory$	$20k
+ $\Delta Accounts\ Payable$	($10k)
+ $\Delta Salaries\ Payable$	$10k
+ $\Delta Interest\ Payable$	($5k)
+ $\Delta Income\ Tax\ Payable$	$1k
Net change in cash from operations:	**$56k**
Investing Cash Flows:	
Purchase of Investments	($130k)
Cash from Sale of Land	$55k
Purchase of Equipment	($50k)
Net Cash Flows from Investing	**($125k)**
Financing Cash Flows	
Issuance of Bonds	$40k
Issuance of Common Stock	$49k
Dividends Paid Out	($10k)
Net Cash Flows from Financing	**$79k**
Net change in cash:	**$10k**

MattCorp Cash Flow Statement, For the Year Ended December 31, 2021 (indirect method)

16.8 Some 'tricks': e.g., non-cash transactions

In the above, I wanted to lay out the main ideas in a clean example, and then try to provide simple rules, to make things easier as you learn. But there are a couple of things that can get thrown into problems, which **you have the knowledge** to solve, but which require going **beyond the rules above**. For example, suppose that our company's *Common Stock* was ***not*** no-par. Then you should be able to apply your knowledge from Chapter 13 to still infer the **cash proceeds** from the issuance of *Common Stock* (i.e., by looking at *APIC*.)

Another common trick in these problems is to include **non-cash purchases of long-term assets**. As we saw in Chapter 12, companies can finance the purchase of long-term assets by signing a *Note Payable*, etc. By default, we would normally assume the purchase of a long-term asset was in cash. But suppose we are explicitly told that the company financed the purchase of new *Equipment* with a *Note Payable*. That means

that the company *directly* swapped *Equipment* for a *Note*—without cash changing hands (yet). That is, the purchase of the *Equipment* was ***not*** **made in cash**, and the issuance of the *Note Pyable* was not a **cash inflow**. If the transaction was **not in cash**, it's **not a cash flow**, full stop. And the Statement of Cash Flows is, **by definition**, about tracking the actual flow of cash. So, in that case, we would **not** put that amount ($) in either the investing section (purchase) or the financing section (*Note*). Instead, we would just **add a footnote** at the bottom of the cash flow statement, saying something like, **"Note: $50k in Equipment purchased via issuance of Note payable."**

You may see other miscellaneous complications thrown into cash-flow statement problems. There's no way to boil down all of them down to one set of rules. The cash flow statement is ultimately about using your **understanding** of what the Balance Sheet and Income Statement *mean* to infer what the underlying transactions were. With all of the 253 pages of knowledge you've gained over the semester, at this point, that's a lot to go on! So, when you see a wrench thrown into these problems, slow down, have courage, and show me what you can do.

A

Practice Problems and Essay Questions

A.1 Chapter 1

A.1.1 Practice Problems: MCQ's

- Which of these is one of the four financial statements that the firm's financial accounting system ultimately produces?
  - (A.) The Chart of Stock Price Performance
  - (B.) The Statement of Long-Term Value
  - **(C.)** The Balance Sheet
  - (D.) The Social Impact Statement
  - (E.) None of the other answers

- Which of the following indicates *equity* financing?
  - (A.) Interest payments.
  - (B.) Owners.
  - (C.) Contractual obligation to pay.
  - (D.) Collateral.

  - (E.) None of the other answers

- Which of the following indicates *credit* financing?
  - (A.) Ownership.
  - (B.) Shares.
  - (C.) Stock.
  - (D.) Debt.
  - (E.) None of the other answers

- Eagle Corp operates MRI clinics throughout the Northeast. At the end of the current period, the company reports the following amounts: Assets = $40k, Liabilities = $30k, Dividends = $2k, Revenues = $13k, Expenses = $6k. The company management asserts that its long-term value is not being fully appreciated by the stock market, and that they will double their profits next year. **Calculate Shareholders' Equity at the end of the period**.
  - **(A.)** $10k
  - (B.) $23k
  - (C.) $70k
  - (D.) $17k
  - (E.) None of the other answers

- Eagle Corp operates MRI clinics throughout the Northeast. At the end of the current period, the company reports the following amounts: Assets = $40k, Liabilities = $30k, Dividends = $2k, Revenues = $13k, Expenses = $6k. The company management asserts that its long-term value is not being fully appreciated by the stock market, and that they will double their profits next year. **Calculate Net Income at the end of the Period**.
  - (A.) $5k
  - **(B.)** $7k
  - (C.) $9k
  - (D.) $10k

  - (E.) None of the other answers

- At the end of Fiscal Year (FY) 2020, ExpoCorp had Assets of $200m, Liabilities of $120m, and Common Stock of $30m. Over FY 2021, ExpoCorp earned Net Income of $20m, and paid out Dividends of $10m. What would its *Retained Earnings* be at the end of FY 2021?

  - (A.) $10m
  - (B.) $20m
  - (C.) $50m
  - **(D.)** $60m
  - (E.) None of the other answers

- What is this company's *Accounts Receivable* balance?

Balance Sheet as of December 31, 2020

Assets	**Liabilities**
Cash: $100	Salaries payable: $100
Accounts receivable: $???	Long term debt: $100
Equipment: $100	**Total Liabilities: $200**
	Shareholder's Equity:
	Common stock: $50
	Retained earnings: $0
	Total Shareholders' Equity: $50
Total Assets: $???	**Total Liabilities and S.E.: $250**

  - (A.) $0
  - **(B.)** $50
  - (C.) $250
  - (D.) Not enough information.
  - (E.) None of the other answers

- If we issue *Common Stock*, is that an operating, financing, or investing activity?

  - (A.) Operating

  - (B.) Investing
  - **(C.)** Financing
  - (D.) None of the above

- From our company's perspective, which of the following would be an **operating cash inflow**?
  - (A.) Paying salaries to employees.
  - (B.) Selling Common Stock to investors.
  - (C.) Making a Cash sale to customers.
  - (D.) Purchasing a factory.
  - (E.) None of the other answers

- Suppose our company has the following transactions with our customers, and *only these*, in Fiscal Year 2021:
  * We provide tutoring to Dane for $200 in cash.
  * Alison pays us $300 in cash up front, for tutoring that we promise to give her next year, in Fiscal Year 2022.
  * We provide tutoring to Avery, who promises/agrees to pay us $100 next year, in Fiscal Year 2022.
- What are our (accrual) revenues for FY 2021?
  - (A.) $200
  - (B.) $300
  - (C.) $500
  - (D.) $600
  - (E.) None of the other answers

- MattCorp does annual reporting, with the fiscal year ending December 31. In FY2020 (January 1, 2020 to December 31, 2020), MattCorp earns a total of $100 in *Revenue*, and incurs $60 in Expenses over that year. **How much *Net Income* would MattCorp report on its Income Statement as of July 1 (exactly halfway through the year)?**

  - (A.) $40
  - (B.) $20
  - (C.) $0
  - **(D.)** Trick question / question makes no sense.
  - (E.) None of the other answers

- Which of the following is a good way of describing what *Net Income* (profit) ***is***, conceptually, in accounting?

  - (A.) The increase in the company's cash
  - (B.) Accounting's way of measuring how much value has been realized for the owners, via the company's operations, over the period.
  - (C.) The total wealth of the shareholders of the company.
  - (D.) The stock price increase.
  - (E.) The amount of money made for the bank lenders of the company.

- Which of the following is a good definition of what ("book") Shareholders' Equity ***is***, conceptually, in accounting?

  - (A.) The amount of financing that owners have contributed (including reinvestment) to the business.
  - (B.) The amount of cash that is held separately for the owners.
  - (C.) How much value has been realized for the owners, via the company's operations, over the reporting period.
  - (D.) None of the other answers
  - (E.) The amount of loans the company has made to its owners.

- What is the name of the account that indicates the total amount that owners have paid into the company to finance it?

  - (A.) Cash
  - (B.) None of the other answers
  - (C.) Common Stock

  - (D.) Dividends
  - (E.) Revenue

- Which of the following organizations would be required to report their financial statements according to GAAP?
  - (A.) Your neighbor's dog-grooming business, which your neighbor owns as sole proprietor.
  - (B.) The Coca-Cola Company
  - (C.) The Gates Foundation
  - (D.) Multiple other answers
  - (E.) None of the other answers

- **Core Identities**: At the end of Fiscal Year (FY) 2020, ExpoCorp had Assets of $200m, Liabilities of $120m, and Common Stock of $30m. Over FY 2021, ExpoCorp earned Net Income of $20m, and paid out Dividends of $10m. What would its Retained Earnings be at the end of FY 2021?
  - (A.) $10m
  - (B.) $20m
  - (C.) $50m
  - **(D.)** $60m
  - (E.) None of the other answers.

- The organization that has been delegated the role of setting accounting standards for publicly-listed companies in the U.S. is...:
  - (A.) GAAP
  - **(B.)** The FASB
  - (C.) The IASB
  - (D.) IFRS
  - (E.) None of the other answers.

- From our company's perspective, the Dividends we pay are a(n):

  - (A.) Expense
  - (B.) Liability
  - (C.) Asset
  - (D.) Revenue
  - (E.) None of the other answers

- When a company pays dividends, all else equal, that will [increase / decrease / have no effect on] its ("book" / accounting) Shareholders' Equity:
  - (A.) Increase
  - **(B.)** Decrease
  - (C.) Have no effect
  - (D.) Not enough information.
  - (E.) None of the other answers.

A.1.2 Practice Problems: Open Prompts

1. We go to a local shop to buy *Supplies* that we plan to use over several reporting periods. The "list price" of the *Supplies* we buy is $12,000. However, the company is having a special sale, selling the *Supplies* for a discount of $10,000. Indeed, the owner tells us that this deal is even better than it may seem, because the *true "market value"* of the *Supplies* is *really* $14,000. After the make this purchase, what value would we record the *Supplies* at on our books?

2. MattCorp does annual, calendar-year reporting. At the end of FY2020, MattCorp reported a balance of *Common Stock* of $1m and *Retained Earnings* of $200k. Over FY2021, MattCorp earned total *Net Income* of $150k. Additionally, MattCorp issued 1,000 shares of *Common Stock* for $50 each on February 17, 2021; and paid total *Dividends* of $100k on November 18, 2021. **Fill out MattCorp's *Statement of Shareholders' Equity* for FY2021.**

3. What are the equations for the **core identities** (accounting equation, net income definition, retained earnings identity)?

4. List the names of the **four financial statements** from memory.

5. Track down the **latest 10-K report filed by Apple**, by searching "EDGAR," the SEC site on which U.S. companies' mandatory filings are distributed and archived, here: https://www.sec.gov/edgar/searchedgar/companysearch.html. **What was Apple's *Net Income* for its most recent fiscal year?**

A.1.3 Essay and Discussion Questions

1. What is the purpose of financial accounting in general? What is this all about? In other words, why are we doing this?

2. We've talked about how it's common to divide the sources of Shareholders' Equity into two categories: 'Paid-in capital' vs. 'Earned capital.' What's the big idea here? What are the accounts associated with these two categories? Why are they together in Shareholders' Equity, and how are they different?

3. We've talked about the "two ways of looking at the accounting equation." What are these? What does the accounting equation tell us, under each view?

A.2 Chapter 2

A.2.1 Practice Problems: MCQ's

- Suppose our company borrows $10,000 from a bank. How do we account for this?

	Assets	Liabilities	Sharehldr Equity
(A.)	+$10k Cash		
(B.)		+$10k Note payable	
(C.)	+$10k Cash		+$10k Note payable
(D.) None of the above			

- Our company buys equipment for $24k in cash. How do we account for this?

	Assets	Liabilities	Sharehldr Equity
(A.)	-$24k Cash		+$24k Equipment
(B.)	-$24k Cash, -$24k Equipment		
(C.)	-$24k Cash, +$24k Equipment		
(D.) None of the above			

- Our company has done the following transactions, and only these, to date.

Transaction	Assets	Liabilities	Sharehldr Equity
#1: Sell Shares for $25k	+$25k Cash		+$25k Common Stock
#2: Get loan of $10k	+$10k Cash	+$10k Note payable	
#3: Buy equipment for $24k	-$24k Cash, +$24k Equipment		
#4: Pre-pay 1 yr rent, $6k	-$6k Cash, +$6k Prepaid rent		

What is our company's Total Assets (balance) at this point, after Transaction #4?

  - (A.) $6k
  - (B.) $30k
  - **(C.)** $35k
  - (D.) $65k
  - (E.) None of the other answers.

- And, what is our company's *Cash* balance at this point, after Transaction #4?

  - **(A.)** $5k
  - (B.) $10k
  - (C.) $25k
  - (D.) $35k

  - (E.) None of the other answers.

- Suppose our company buys a factory from another company for $15m in Cash. (We would put this factory in our *Plant* account.) However, our management is *extremely confident* that, with our superior management practices, and world-class employees, we can actually *double* the productivity and output of that factory. What would be the initial value/amount of *Plant* that we would record in our company's accounting (that is, "on our books") after this purchase?
  - (A.) $0
  - (B.) $15m
  - (C.) $30m
  - (D.) Not enough information.

- Which of the following represents, conceptually, *credit financing provided by our suppliers*?
  - (A.) *Notes Payable (L)*
  - (B.) *Accounts Payable (L)*
  - (C.) *Supplies (A)*
  - (D.) Multiple other answers
  - (E.) None of the other answers

- Suppose that this customer pays cash to us in November of 2021, for a soccer camp that will take place in February 2022. Our firm does **annual reporting** aligned with the **calendar year**. Assuming things go as expected, in what Fiscal Year would we report *Revenue* from this sale?
  - (A.) 2021
  - **(B.)** 2022
  - (C.) *Listen to your heart.*
  - (D.) None of the above.

- But, continuing with the example from the question above, should we *account for something* about this transaction (that is, record something on our books) on the date on which the customer pays us cash?
  - (A.) Yes—because we have earned profit.
  - (B.) No—because we haven't earned profit yet.
  - **(C.)** Yes—because we got cash.
  - (D.) *Listen to your heart.*

- Which of the following purchases / expenditures would be "fully and immediately expensed" under GAAP accounting?
  - (A.) Paying for a 2-year lease on a building
  - (B.) Purchasing Inventory
  - **(C.)** Paying the electricity bill for the company's headquarters
  - (D.) Purchasing supplies on account
  - (E.) None of the other answers.

- When a customer pays up front for a good/service that will be provided at a later date, this is a(n):
  - (A.) Accounts receivable transaction
  - **(B.)** Deferred revenue transaction
  - (C.) Prepaid expense
  - (D.) Asset capitalization
  - (E.) Accrual

- Which of the following can be interpreted to represent, conceptually, credit financing provided to our company by our customers?
  - (A.) Deferred Revenue
  - (B.) Accounts Receivable
  - (C.) Accounts Payable
  - (D.) Notes Payable

  - (E.) None of the other answers.

- If our company purchases *Equipment* for *Cash*, our total asset balance (increases, decreases, is unchanged):
  - (A.) increases
  - (B.) decreases
  - **(C.)** is unchanged
  - (D.) none of the other answers.

- If we provide a service to a customer *on account*, our company's total asset balance (increases, decreases, is unchanged):
  - **(A.)** increases
  - (B.) decreases
  - (C.) is unchanged
  - (D.) none of the other answers.

- If one of our customers pays down their past account (that is, pays cash for services we had provided to them on credit at an earlier date), our company's total asset balance (increases, decreases, is unchanged):
  - (A.) increases
  - (B.) decreases
  - **(C.)** is unchanged
  - (D.) none of the other answers.

- During its first month of operations, SoccerCorp: -borrowed $100,000 from a bank, -bought a piece of equipment for $30,000 in cash, -bought supplies that it planned to use for multiple quarters for $50,000 on account, -provided services to customers for $20,000 on account, -paid out $30,000 cash to pay down one of its accounts payable, -and paid $15,000 cash for utilities expense. What is the company's total asset balance at the end of the month?
  - **(A.)** $125k

  - (B.) $105
  - (C.) $150
  - (D.) $165
  - (E.) None of the other answers

- If our company sells to a customer on account, this will affect the measures reported on the:
  - (A.) Income Statement
  - (B.) Balance Sheet
  - (C.) Statement of Shareholders' Equity
  - **(D.)** Multiple other answers.
  - (E.) None of the other answers

- If our company collects on an account from a customer from a credit sale from a previous period, this will affect measures reported on our:
  - (A.) Income Statement
  - **(B.)** Balance Sheet
  - (C.) Statement of Shareholders' Equity
  - (D.) Multiple other answers
  - (E.) None of the other answers

- When a company purchases something in cash and 'capitalizes' that purchase as an asset:
  - **(A.)** total assets will remain the same
  - (B.) stockholders equity will increase
  - (C.) total assets will increase
  - (D.) total assets will decrease
  - (E.) none of the other answers.

- Which of the following can partly determine whether an expenditure on something will be initially recognized as an asset or as an expense in the company's accounting:

  - A. Whether the managers expect to use the thing over multiple reporting periods
  - B. Whether the company received a discount on the thing
  - C. Whether the company pays in cash or buys the thing on account
  - D. Whether the thing can reliably be matched to revenues in future periods
  - **E.** Two of the other options.

A.2.2 Practice Problems: Open Prompts

- Account for the following transactions with the Accounting Equation format

  - 2/14/2022: Issue 1000 shares of *Common Stock* for $50 each.
  - 3/01/2022: Get a $200k loan from a bank.
  - 3/16/2022: Provide swimming lessons to customers for $10k in cash.
  - 3/17/2022: Pay quarterly electricity bill, $5k.
  - 3/22/2022: Receive payment of $8k from customers in advance, for lessons to be provided in April.
  - 04/01/2022: Pay biweekly salaries to employees, a total of $20k.
  - 04/10/2022: Provide the swimming lessons as contractually agreed and paid for in the March 22 transaction above.
  - 04/12/2022: Purchase *Supplies* on account, with a promise to pay the $2k invoice later.
  - 04/15/2022: Pay biweekly salaries to employees, a total of $20k.
  - 04/20/2022: Pay off the account from the April 12th purchase of *Supplies*.

Date	Assets	Liabilities	Shareholders' Equity

- Our company has done the following transactions, and only these, to date.

Transaction	Assets	Liabilities	Sharehldr Equity
#1: Sell Shares for $25k	+$25k Cash		+$25k Common Stock
#2: Get loan of $10k	+$10k Cash	+$10k Note payable	
#3: Buy equipment for $24k	-$24k Cash, +$24k Equipment		
#4: Pre-pay 1 yr rent, $6k	-$6k Cash, +$6k Prepaid rent		
#5: Buy supplies on account, $2.3k	+$2.3k Supplies	+$2.3k Accounts Payable	

  Suppose that we ended our reporting period here, with no more transactions of any kind. What would our *Balance Sheet* look like at this point? (That is, fill out a Balance Sheet, based on what the account balances would be, as of this point in time, after Transaction #5.)

- Account for the following transactions with the Accounting Equation format
  - 05/15/2022: Customer pays us up front, $5k, for lessons to be provided at a later date.
  - 06/15/2022: We provide the lessons to the customer above, from the May 15 transaction.
  - 07/15/2022: We provide lessons to another customer, on account—the customer accepts our invoice for $6k
  - 08/15/2022: The customer from the July 15 service pays off their account in full.

Date	Assets	Liabilities	Shareholders' Equity

- Suppose our company has the following transactions with our customers, and only these, in Fiscal Year 2021:
  - We provide tutoring to Dane for $400 in cash.
  - Alison pays us $100 in cash up front, for tutoring that we promise to give her next year, in Fiscal Year 2022.
  - We provide tutoring to Avery, who promises/agrees to pay us $300 next year, in Fiscal Year 2022.
  - We receive $200 in cash from Declan, for tutoring that we had provided to him in Fiscal Year 2020.

  What are our (accrual) revenues for FY 2021?

A.2.3 Essay and Discussion Questions

1. It's common to hear CEOs say things like 'The reason we weren't profitable this quarter is that we're investing for the future.' For example, after missing Wall Street expected earnings, CEO "CEO Michelle Gass said in a statement that the company is 'investing in the short-term' in order to 'drive profitable growth over the long-term" (L. Thomas, CNBC, May 2021). Based on what we've learned so far, what do you make of this? (Hint: This question is prompting you to first reference the specific technical thing we've learned that suggests why this excuse is not obviously legitimate.) Once you've covered that technical bit, give your own opinion according to your own reasoning and judgment.

2. What are the two main principles that define accrual-basis accounting? And what is the idea behind them? What is the logic behind this complexity? In other words, can you give some examples or explanation of why these two principles seem to make economic sense?

A.3 Chapter 3

A.3.1 Practice Problems: MCQ's

- Which of the following "tools" reports the final balances of all of our company's accounts, in one list/table?
  - (A.) A trial balance
  - (B.) A T-account
  - (C.) A journal entry
  - (D.) An income statement
  - (E.) None of the other answers

- Which tool reports the incremental effect of a particular transaction–i.e., the *changes* in the accounts affected?
  - (A.) A trial balance
  - (B.) A T-account
  - (C. A journal entry
  - (D.) An income statement
  - (E.) None of the other answers

- Which tool reports the full sequence of updates to, and final balance of, a *particular* account?
  - (A.) A trial balance
  - (B.) A T-account
  - (C.) A journal entry
  - (D.) An income statement
  - (E.) None of the other answers

- What does debit *mean*?
  - (A.) *Good.*
  - (B.) "On the right."

  - (C.) The company made a bad choice.
  - (D.) Shareholders' Equity has increased.
  - **(E.)** None of the other answers

- If a liability account increases, that's a (credit / debit)
  - **(A.)** Credit
  - (B.) Debit
  - (C.) Not enough information
  - (D.) None of the other answers.

- If the *Common Stock* account increases, that's a (credit / debit)
  - **(A.)** Credit
  - (B.) Debit
  - (C.) Not enough information
  - (D.) None of the other answers.

- Which of the below is a **debit account**?
  - (A.) *Common Stock*
  - (B.) *Equipment*
  - (C.) *Notes Payable*
  - (D.) Multiple other answers
  - (E.) None of the other answers.

- Which of the below is a **credit account**?
  - (A.) *Common Stock*
  - (B.) *Equipment*
  - (C.) *Revenue*
  - **(D.)** Multiple other answers

  - (E.) None of the other answers.

- *Salaries Expense* is a (debit account / credit account):
  - **(A.)** Debit account
  - (B.) Credit account
  - (C.) Not enough information
  - (D.) None of the other answers.

- Indicate the correct journal entry for this transaction: **Get a $10k loan from a bank**.
  - **(A.)** Debit *Cash* $10k; Credit *Notes Payable* $10k
  - (B.) Debit *Notes Payable* $10k; Credit *Cash* $10k
  - (C.) Debit *Notes Payable* $10k; Credit *Liability* $10k
  - (D.) Debit *Cash* $10k; Credit *Accounts Payable* $10k
  - (E.) Not enough information—depends on prior cash and liability balances.

- Indicate the correct journal entry for this transaction: **Customer pays $10k for services that we deliver immediately**.
  - (A.) Debit *Cash* $10k; Credit *Deferred Revenue* $10k
  - (B.) Debit *Revenue* $10k; Credit *Cash* $10k
  - **(C.)** Debit *Cash* $10k; Credit *Revenue* $10k
  - (D.) Debit *Accounts Receivable* $10k; Credit *Revenue* $10k
  - (E.) Not enough information—depends on prior account balances.

- Indicate the correct journal entry for this transaction: **We provide services on account, to a customer who accepts an invoice for $10k**.
  - (A.) Debit *Cash* $10k; Credit *Deferred Revenue* $10k
  - (B.) Debit *Revenue* $10k; Credit *Cash* $10k
  - (C.) Debit *Cash* $10k; Credit *Revenue* $10k
  - **(D.)** Debit *Accounts Receivable* $10k; Credit *Revenue* $10k

  - (E.) Not enough information—depends on prior account balances.

- Indicate the correct journal entry for this transaction: **The customer from the transaction above, now weeks later, pays down their outstanding account of $10k, in full.**
  - (A.) Debit *Cash* $10k; Credit *Revenue* $10k
  - (B.) Debit *Revenue* $10k; Credit *Cash* $10k
  - **(C.)** Debit *Cash* $10k; Credit *Accounts Receivable* $10k
  - (D.) Debit *Accounts Receivable* $10k; Credit *Revenue* $10k
  - (E.) None of the above.

- Indicate the correct journal entry for this transaction: **Purchase Supplies that we plan to use for several periods, for $10k in cash**.
  - (A.) Debit *Cash* $10k; Credit *Supplies* $10k
  - (B.) Debit *Supplies Expense* $10k; Credit *Accounts Payable* $10k
  - **(C.)** Debit *Supplies* $10k; Credit *Cash* $10k
  - (D.) Debit *Cash* $10k; Credit *Supplies* $10k
  - (E.) Not enough information—depends on prior account balances.

- Indicate the correct journal entry for this transaction: **Pay $10k salaries to our employees, on an ordinary bi-weekly payday in July** (that is, in the middle of our annual calendar-year reporting period).
  - (A.) Debit *Cash* $10k; Credit *Salaries Expense* $10k
  - (B.) Debit *Employee Assets* $10k; Credit *Cash* $10k
  - **(C.)** Debit *Salaries Expense* $10k; Credit *Cash* $10k
  - (D.) Debit *Salaries Expense* $10k; Credit *Salaries Payable* $10k

- What will our *Cash* **T-account** look after our company begins its life and does the following 3 transactions: #1: Sell Shares of Common Stock for $25k, #2: Get a bank loan for $10k, #2: Buy Equipment for $24k.

– (A.)

Cash (A)

Debits	Credits
	$24k

– **(B.)**

Cash (A)

Debits	Credits
$25k	$24k
$10k	

– (C.)

Cash (A)

Debits	Credits
$24k	$25k
	$10k

- Previously, on January 3, 2022, our customer bought from us on account, promising to pay $20k later. Now, today, on February 23rd, they pay off half of their account, paying $10k in cash to us. What is the journal entry for this February 23rd transaction?
  - **(A.)** Debit *Cash* $10k; Credit *Accounts Receivable* $10k
  - (B.) Debit *Cash* $10k; Credit *Revenue* $10k
  - (C.) Debit *Cash* $10k, Debit *Accounts Receivable* $10k; Credit *Revenue* $20k
  - (D.) Debit *Cash* $10k; Credit *Accounts Receivable* $10k, Credit *Revenue* $20k
  - (E.) No journal entry—not an external transaction.

- A new customer comes in and purchases services of $20k, but can only pay $10k in cash today. We accept the $10k in cash from the customer, and the customer accepts a $10k invoice to pay the remainder later. Indicate the correct journal entry for this transaction:
  - (A.) Debit *Cash* $20k; Credit *Revenue* $20k
  - (B.) Debit *Cash* $10k; Credit *Revenue* $10k
  - **(C.)** Debit *Cash* $10k, Debit *Accounts Receivable* $10k; Credit *Revenue* $20k
  - (D.) Debit *Cash* $10k; Credit *Deferred Revenue* $10k
  - (E.) No journal entry—transaction not completed yet.

- Frankie owns a landscaping and lawn maintenance company, while Riley owns a machine repair shop. For the month of July, the following transactions occurred.
    * July 3: Frankie provides lawn services to Riley's repair shop on account, $370.
    * July 6: One of Frankie's mowers malfunctions. Riley provides repair services to Jake on account, $320.
    * July 9: Riley pays $370 to Frankie for lawn services provided on July 3.
- What is the correct journal entry for the July 3rd transaction, from Frankie's perspective?
    - (A.) Debit Operating Expenses $370, Credit Cash $370
    - (B.) Debit Accounts Receivable $370, Credit Cash $370
    - (C.) Debit Cash $370, Credit Accounts Payable $370
    - (D.) Debit Accounts Payable $370, Credit Cash $370
    - **(E.)** None of the other answers
- Continuing with the setup of the problem above, what is the correct journal entry for the July 3rd transaction, from Riley's perspective?
    - (A.) Debit Operating Expenses $370, Credit Cash $370
    - (B.) Debit Accounts Receivable $370, Credit Cash $370
    - (C.) Debit Cash $370, Credit Accounts Payable $370
    - (D.) Debit Accounts Payable $370, Credit Cash $370
    - **(E.)** None of the other answers
- Continuing with the setup of the problem above, what is the correct journal entry for the July 9th transaction, from Frankie's perspective?
    - (A.) Debit Operating Expenses $370, Credit Cash $370
    - (B.) Debit Accounts Receivable $370, Credit Cash $370
    - (C.) Debit Cash $370, Credit Accounts Payable $370
    - (D.) Debit Accounts Payable $370, Credit Cash $370
    - **(E.)** None of the other answers

- CoyoteCorp is a small company that provides nature tours, hiring nature guides as temps during the summer. At the beginning of FY2017, CoyoteCorp has a balance of $12k in the Retained Earnings account. Over the FY2017 reporting period, CoyoteCorp had the following transactions and only these:

  - Issued an additional $10k in Common Stock
  - Provided services to customers on account, $20k
  - Purchased Equipment for Cash, $8k
  - Paid employee salaries in full for the period, $10k
  - Pay dividends to stockholders, $6k

- What would CoyoteCorp's reported Retained Earnings be as of the end of FY2017?
  - (A.) $4k
  - (B.) $10k
  - **(C.)** $16k
  - (D.) $26k
  - (E.) None of the other answers.

A.3.2 Practice Problems: Open Prompts

1. Explain why expenses are debit accounts (2-3 sentences).
2. Explain to me, as if I am a newbie, what the difference between a journal entry and a T-account is. Why is it that, for example, when we *journalized* Transaction #2, we just accounted for the $10k in *Cash* from the bank loan, and ignored the *Cash* from the previous *Common Stock* issuance (2-4 sentences).
3. "Journalize" (that is, write out the journal entries) the following transactions:
   - January 2: Corporation begins its life and sells 5000 shares of Common Stock for $100 a share.
   - January 3: Purchase a large factory (*Plant*) for $2m.
   - January 5: Purchase *Supplies* for $1m, on account.
   - January 12: Pay off the account from the January 5th transaction, in full.
4. Write out all the **T-accounts** (including netting out final balances) for the company above, after the January 12th transaction.
5. Write out the **Trial Balance** at that point in time (that is, immediately after the January 12th transaction)
6. "Journalize" the following transactions:
   - February 1: Provide services to customers for $10k in cash.

- February 5: Accept payment up front of $5k, from customers who plan to return for services later.
- February 12: The customers from the February 5th transaction come back, and we provide the agreed services to them.
- February 15: Pay $10k salaries to our employees, an ordinary biweekly payday.
- February 20: We provide lessons to customers who accept an invoice for $5k and promise to pay us later.
- February 27: the customers from the February 20 transaction come back and pay off their account in full.

A.3.3 Essay and Discussion Questions

1. Explain to me, as if I am a newbie, what debits-and-credits are all about. That is, explain how this is an algorithm that keeps The Accounting Equation in balance.

A.4 Chapter 4

A.4.1 Practice Problems: MCQ's

- Hugo's, a specialty clothing store, does annual, calendar-year reporting. On **July 1**, 2021, Hugo's pays $48k for a 2-year lease of a space in a local mall. What will be the related adjusting entry Hugo's will make before closing the books on December 31, 2021?
  - (A.) Debit Rent Expense $24k; Credit Prepaid Rent $24k
  - **(B.)** Debit Rent Expense $12k; Credit Prepaid Rent $12k
  - (C.) Debit Rent Expense $8k; Credit Prepaid Rent $8k
  - (D.) Debit Rent Expense $6k; Credit Prepaid Rent $6k
  - (E.) None of the other answers

- Hugo's, a specialty clothing store, does annual, calendar-year reporting. On **September 1**, 2021, Hugo's pays $48k for a 2-year lease of a space in a local mall. What will be the related adjusting entry Hugo's will make before closing the books on December 31, 2021?
  - (A.) Debit Rent Expense $24k; Credit Prepaid Rent $24k
  - (B.) Debit Rent Expense $12k; Credit Prepaid Rent $12k
  - **(C.)** Debit Rent Expense $8k; Credit Prepaid Rent $8k
  - (D.) Debit Rent Expense $6k; Credit Prepaid Rent $6k
  - (E.) None of the other answers

- ExpoCorp reported Prepaid Rent of $500k on its FY2021 Balance Sheet, and Prepaid Rent of $400k on its FY2022 Balance Sheet. During FY2022, ExpoCorp signed one additional long-term lease, paying $200k up front. What was ExpoCorp's Rent Expense in FY2022?
  - (A.) $200k,
  - (B.) $400k
  - **(C.)** $300k
  - (D.) $500k

  - (E.) None of the other answers.

- On July 1, 2021, we bought Equipment, paying $100k. We assume that we will use the Equipment for 10 years, and it will have 0 salvage value at the end of that time, and use the straight-line depreciation method. What would be the *Depreciation Expense* we would record for **FY 2021**?
  - **(A.)** $5k
  - (B.) $10k
  - (C.) $25k
  - (D.) $75k
  - (E.) None of the other answers.

- On July 1, 2021, we bought Equipment, paying $100k. We assume that we will use the Equipment for 10 years, and it will have 0 salvage value at the end of that time, and use the straight-line depreciation method. What would be the *Depreciation Expense* we would record for **FY 2022**?
  - (A.) $5k
  - (B. $10k
  - (C.) $25k
  - (D.) $75k
  - (E.) None of the other answers.

- On July 1, 2021, we bought Equipment, paying $100k. We assume that we will use the Equipment for 10 years, and it will have $20k salvage value at the end of that time, and use the straight-line depreciation method. What would be the *Depreciation Expense* we would record for **FY 2022**?
  - (A.) $4k
  - (B.) $5k
  - **(C.)** $8k
  - (D.) $10k
  - (E.) None of the other answers.

A.4.2 Practice Problems: Open Prompts

1. ExpoCorp reports Supplies of $100k on its FY2021 Balance Sheet, and Supplies of $120k on its FY2022 Balance Sheet. On its FY2022 Income Statement, ExpoCorp reports a Supplies Expense of $40k. How much did ExpoCorp purchase in Supplies in FY2022? **(Answer: $60k)**

2. ExpoCorp reported Prepaid Rent of $700k on its FY2021 Balance Sheet, and Prepaid Rent of $500k on its FY2022 Balance Sheet. During FY2022, ExpoCorp signed one additional long-term lease, paying $200k up front. What was ExpoCorp's Rent Expense in FY2022? **(Answer: $400k)**

A.4.3 Essay and Discussion Questions

1. In this chapter, we made the end-of-period adjusting entry for the *Supplies* we had used over the period, like so:

	Debit	**Credit**
Supplies Expense (-S.E.)	$.4k	
Supplies (-A)		$.4k

... So that the *Supplies* T-account at the end of the period looked like this:

Supplies	
$1,000	$400
$600	

Explain this adjusting entry from the "income statement perspective" vs. balance sheet perspective." That is, explain what we mean by the two perspectives, and how to think about / articulate the adjusting entry from each perspective.

2. What do you think about the "weirdness" of accounting depreciation? Is it problematic that *Depreciation Expense*, which is ultimately determined by unverifiable managerial expectations and assumptions, affects the "bottom line" profitability? Is it a problem that the accounting depreciation of an asset doesn't necessarily track the real decline in its market/economic value?

The answer to this question surely can't be simple. If you think these things *are* a problem, then why do the smart people at the *FASB* have such standards? So a judicious and solid answer also has to think through the positives here, the reason why things are done the way they are...

A.5 Chapter 5

A.5.1 Practice Problems: MCQ's

- On July 1, 2021, we bought Equipment, paying $100k. We assume that we will use the Equipment for 10 years, and it will have 0 salvage value at the end of that time, and use the straight-line depreciation method. What would be the balance of the *Accumulated Depreciation* (*contra-A*) account, after making the adjusting entries and closing the books, as of December 31, 2023?
  - (A.) $5k
  - (B.) $10k
  - (C.) $25k
  - (D.) $75k
  - (E.) None of the other answers.

- On July 1, 2021, we bought Equipment, paying $100k. We assume that we will use the Equipment for 10 years, and it will have 0 salvage value at the end of that time, and use the straight-line depreciation method. What would be the **book value** of the *Equipment*, after making the adjusting entries and closing the books, as of December 31, 2023?
  - (A.) $100k
  - (B.) $10k
  - (C.) $25k
  - **(D.)** $75k
  - (E.) None of the other answers.

- What is the general term that is used to indicate the time horizon of assets and liabilities—i.e., the speed with which they could be used or converted into cash or settled?
  - (A.) Verifiability
  - (B.) Depreciation
  - (C.) Capitalization
  - (D.) Liquidity

  - (E.) Conservatism

- On the Balance Sheet, Assets and Liabilities are roughly listed in order of...:
  - (A.) Verifiability
  - (B.) Size
  - (C.) Liquidity
  - (D.) Solvency
  - (E.) Equity

- *Accumulated Depreciation* is a...:
  - (A.) debit account
  - **(B.)** credit account
  - (C.) none of the other answers.

- *Accounts Payable* is a:
  - (A.) Current asset
  - (B.) Non-current asset
  - (C.) Current liability
  - (D.) Non-current liability
  - (E.) None of the other answers.

A.5.2 Practice Problems: Open Prompts

1. RustiCorp owns one major tangible asset: a large plant. In its most recent financial statement, it reported depreciation expenses of $1.3m. It further disclosed that the*Accumulated Depreciation (contra-A)* on the plant was $31.85m, and it was using straight-line depreciation. How long ago did Rusticorp buy this asset? **(Answer: 31.85/1.3 = 24.5 years ago.)**

2. **Core Identities / Classification of Balance Sheet**: ExpoCorp reports Total Liabilities of $60m, Common Stock of $30m, and Retained Earnings of $10m on its FY2021 Balance Sheet. Its long-term assets total $60m. What are ExpoCorp's total current assets ($)?

3. In its Quarter 1 financial statements, TestCorp reported a cash balance of $50m, other assets of $240m, Shareholders' Equity of $80m, and current liabilities of $40m. Its Statement of Shareholders' Equity indicated that it had paid out dividends of $10m, and ended the quarter with a retained earnings balance of $30m. What were its long-term/non-current liabilities at the end of Quarter 1? **(Answer: 290m - 80m - 40m = 170m. In words: Total assets is $290m (cash of 50m and 'other assets' of $240m. Total S.E. is $80m. Therefore, total liabilities must be $210m. So, long-term /non-current liabilities must be $170m ($210 - $40m). Everything else is a distraction.)**

4. Find the **latest 10-K report filed by Apple**, by searching "EDGAR," the SEC site on which U.S. companies' mandatory filings are distributed and archived, here: https://www.sec.gov/edgar/searchedgar/companysearch.html. What are Apple's total **current assets** (vs. long-term / or total assets)? How does this jibe with what you know about the company?

A.5.3 Essay and Discussion Questions

(No essay topics from Chapter 5, since it is so "mechanical.")

A.6 Chapter 6

A.6.1 Practice Problems: MCQ's

- Which of the following is a measure of the riskiness of a company's financing?
  - (A.) Leverage
  - (B.) Margin
  - (C.) Asset Turnover
  - (D.) Short-term focus
  - (E.) Liquidity

- Which of the following ratios represents the calculation of leverage:
  - A. (NI/S)
  - B. (Current Assets / Current Liabilities)
  - C. (NI/A)
  - D. (S/A)
  - E. (A/E)

- Which of the below represents Profit Margin:
  - A. NI/S
  - B. NI/E
  - C. $NI/((A_t + A_{t-1})/2)$
  - D. S/A
  - E. None of the other answers.

A.6.2 Practice Problems: Open Prompts

1. Calculate **ROE, ROA, Profit Margin, Leverage, and Asset Turnover** for MattCorp for FY2021, based on the following financial statements:

Revenue:	**$200k**
Salaries expenses:	**$60k**
Depreciation expenses:	**$40k**
Interest expense:	**$20k**
Income tax expense:	**$20k**
Net Income:	**$60k**

Table A.1: MattCorp Income Statement, For the Year Ended December 31, 2021:

	2021	2020
Assets:		
Cash	**$200k**	**$80k**
Supplies	**$100k**	**$20k**
Land	**$200k**	**$200k**
Total assets:	**$500k**	**$300k**
Liabilities:		
Accounts payable	**$50k**	**$50k**
Salaries payable	**$30k**	**$50k**
Notes payable	**$300k**	**$100k**
Shareholders' Equity:		
Common Stock	**$100k**	**$100k**
Retained Earnings	**$20k**	**$0k**
Total Liabilities and S.E.:	**$500k**	**$300k**

Table A.2: MattCorp Balance Sheets, Years Ended December 31:

2. Find the **latest 10-K report filed by Apple**, by searching "EDGAR," the SEC site on which U.S. companies' mandatory filings are distributed and archived, here: https://www.sec.gov/edgar/searchedgar/companysearch.html. Then, **calculate Apple's ROA, ROE, and Profit Margin** for the most recent fiscal year, and the previous, using the numbers from the official, audited financial statements within.

A.6.3 Essay and Discussion Questions

- Everyone in the business world agrees and says that **"leverage means risk."** But explain why, very deeply, as if I am a complete newbie. What exactly is leverage? And why would changing ***who we get our financing from*** (creditors vs. owners) change the riskiness of our company?

A.7 Chapter 7

A.7.1 Practice Problems: MCQ's

- If our company earns *Revenue* on a particular transaction / date, which of the following might that be linked to (i.e., the other account affected as a result / the other line of the journal entry)?
  - (A.) An asset decreasing
  - (B.) A liability decreasing
  - (C.) A liability increasing
  - (D.) Multiple of the other answers
  - (E.) None of the other answers

- If our company incurs an *Expense*, which of the following might that be linked to (i.e., the other account affected as a result / the other line of the journal entry)?
  - (A.) An asset decreasing
  - (B.) A liability decreasing
  - (C.) A liability increasing
  - (D.) Multiple of the other answers
  - (E.) None of the other answers

- FinCorp does annual calendar-year reporting. At the end of FY2021, FinCorp reported $60m of cash, $30m of Accounts Receivable, and $40m of Revenue. At the end of FY2022, FinCorp reported $80m of cash, $60m of Accounts Receivable, and $60m of Revenue. FinCorp never had any *Deferred Revenue* at any point. How much cash did FinCorp actually collect in cash from customers in 2022?
  - (A.) $0m
  - (B.) $20m
  - **(C.)** $30m
  - (D.) $60m
  - (E.) None of the other answers

- What is an example of a liability that will not be settled in cash?
  - (A.) Accounts payable
  - (B.) Salaries payable
  - (C.) Interest receivable
  - (D.) Depreciation expense
  - **(E.)** Deferred revenue

- **Setup**: ExpoCorp does annual, calendar year reporting, and pays its employees monthly, on the first Friday of each month. Its employees earn $700 per week. On Friday, December 3rd, 2021, it pays its employees their accrued salaries in full. On December 31, 2021, ExpoCorp makes its adjusting entries for the fiscal year. On Friday, January 7th, 2021, it is another payday, and ExpoCorp pays its employees in full. **Question**: What would be the balance of ExpoCorp's *Salaries Payable* account, after paying salaries on January 7th, 2021?
  - **(A.)** $0
  - (B.) $2,800
  - (C.) $3,500
  - (D.) $700
  - (E.) None of the other answers

- Which of the below would be an example of an **accrued expense** for our company?
  - (A.) Interest on loans
  - (B.) Customer paying us on account
  - (C.) Customer paying us up front, befeore we provide a service
  - (D.) Prepaid rent
  - (E.) None of the other answers.

- **Setup**: ExpoCorp reported *Salaries Payable* of $120k on its FY2021 Balance Sheet, and $140k for FY2022. On its Income Statement, it reported *Salaries Expense* of $800k in FY2022. How much did ExpoCorp actually pay in salaries in FY2022?

  - (A.) $920
  - (B.) $660
  - (C.) None of the other answers.
  - **(D.)** $780

- Setup: ExpoCorp does annual, calendar year reporting, and pays its employees monthly, on the first Friday of each month. Its employees earn $700 per week. On Friday, December 3rd, 2021, it pays its employees their accrued salaries in full. On December 31, 2021, ExpoCorp makes its adjusting entries for the fiscal year. On Friday, January 7th, 2022, it is another payday, and ExpoCorp pays its employees in full, for the last 5 weeks of work. What would be the journal entry for the January 7th payment to employees?
  - (A.) Debit Salaries Expense $3,500; Credit Cash $3,500
  - (B.) Debit Salaries Payable $3,500; Credit Cash $3,500
  - (C.) Debit Salaries Payable $2,800; Credit Cash $2,800
  - (D.) Debit Salaries Expense $700; Credit Cash $700
  - **(E.)** None of the other answers

A.7.2 Practice Problems: Open Prompts

- ExpoCorp reported *Salaries Payable* of $120k on its FY2021 Balance Sheet, and $140k for FY2022. On its Income Statement, it reported *Salaries Expense* of $800k in FY2022. How much did ExpoCorp actually pay in salaries?

- FinCorp does annual calendar-year reporting. At the end of FY2021, FinCorp reported $80m of Accounts Receivable. At the end of FY2022, FinCorp reported $100m of Accounts Receivable, and $60m of Revenue. FinCorp never had any Deferred Revenue at any point. How much cash did FinCorp actually collect in cash from customers in 2022?

A.7.3 Essay and Discussion Questions

1. You're doing your first finance course, and the professor says that "working capital accounts represent customer and supplier financing." Your friend, who never came to office hours for BUAD 280, does not understand this statement. "Wait,

what?," they ask. "Financing comes from banks... customer financing? Supplier financing?" Explain to your friend the meaning of the professor's statement. What is working capital, what are the specific accounts in play here, and why does it make sense to see them as forms of customer/supplier financing?

2. One of the most confusing things about the course so far was understanding the relationship between income statement and balance sheet accounts. They measure different things (performance vs. position), using different accounts and line items, and yet somehow are kept in sync—the income statement effects shareholders' equity, and shareholders' equity is reported on the balance sheet. Can you help me understand this? Illustrate the idea in words and but feel free to reference journal entry examples.

3. What is the difference between an internal transaction and an external transaction? When you 'earn down' deferred revenue liability, is that internal or external? (Hint: If the answer is that 'it depends,' provide some examples of when it would be either, and why.)

4. You see the following journal entry:

	Debit	**Credit**
Cash (+A)	$3.5k	
Accounts Receivable (+A)	$1.5k	
Revenue (+S.E.)		$5k

Explain what has happened in this transaction, and explain the quantities here from the "Income Statement perspective" (focusing first on the measurement of activities that earn revenues and incur expenses, and thinking of the B/S as a plug) AND the "Balance Sheet perspective" (which focuses first on the measurement of assets and liabilities, and thinks of the I/S as a plug).

A.8 Chapter 8

A.8.1 Practice Problems: MCQ's

1. Which of the following are allowable methods for accounting for uncollectible receivables under GAAP?

   (a) Direct Writeoff Method

   (b) Percentage-of-credit-sales method

   (c) Allowance Method

   (d) Multiple of the above

   (e) All of the above

2. What is the journal entry we would make on the date on which we write off an account of $X under the Direct Writeoff Method?

   (a) Debit Bad Debt Expense $X, Credit Allowance for Doubtful Accounts $X

   (b) Debit Bad Debt Expense $X, Credit Accounts Receivable $X

   (c) Debit Allowance for Doubtful Accounts $X, Credit Accounts Receivable $X

   (d) It depends on our previous assumptions about the amount uncollectible.

   (e) None of the above

3. What is the journal entry we would make on the date on which we write off an account of $X under the Allowance Method?

   (a) Debit Bad Debt Expense $X, Credit Allowance for Doubtful Accounts $X

   (b) Debit Bad Debt Expense $X, Credit Accounts Receivable $X

   (c) Debit Allowance for Doubtful Accounts $X, Credit Accounts Receivable $X

   (d) It depends on our previous assumptions about the amount uncollectible.

   (e) None of the above

4. Under the *percentage-of-credit-sales* method, all else equal, the greater our *write-offs during the period*, the [higher / lower / no change] will be our *Bad Debt Expense*?

(a) Higher

(b) Lower

(c) Unchanged

(d) Not enough information.

(e) None of the other answers.

5. Under the *percentage-of-credit-sales* method, all else equal, the greater our *collections on past periods' accounts during this period*, the [higher / lower / no change] will be our *Bad Debt Expense*?

(a) Higher

(b) Lower

(c) Unchanged

(d) Not enough information.

(e) None of the other answers.

6. Under the *Allowance* method, all else equal, the greater our *writeoffs during the period*, the [higher / lower / no change] will be our *Net Income*?

(a) Higher

(b) Lower

(c) Unchanged

(d) Not enough information.

(e) None of the other answers.

7. Under the *Allowance* method, all else equal, the greater our *collections on past periods' accounts during this period*, the [higher / lower / no change] will be our *Net Income*?

(a) Higher

(b) Lower

(c) Unchanged

(d) Not enough information.

(e) None of the other answers.

8. Under the *Allowance* method, holding all else equal (i.e., total cash sales and unrelated expenses), the greater our *credit sales during this period*, the [higher / lower / no change] will be our *Net Income*?

   (a) Higher

   (b) Lower

   (c) Unchanged

   (d) Not enough information.

   (e) None of the other answers.

9. Our company accounts for bad debts / receivables using the ***percentage-of-credit-sales method***, assuming 10% of credit sales will be uncollectible. We began FY2020 with a balance of $100k in *Accounts Receivable* and $20k in our *Allowance for Doubtful Accounts*. During FY2020, we made an additional $200k in credit sales, and collected $40k on accounts from past credit sales. Customers with accounts totaling $10k declared bankruptcy. What would be our FY2020 *Bad Debt Expense*?

   (a) $20k

   (b) $10k

   (c) $30k

   (d) $5k

   (e) None of the other answers.

10. Consider the following scenario: MarshallCo uses the income-statement / percentage-of-credit sales method for accounting for bad debts, and assumes 10% of credit sales each period will be uncollectible. In 2019, MarshallCo starts up its life and sells $1m on account. In 2020, MarshallCo (i.) collects all $1m from 2019, and (ii.) makes an additional $1m in new credit sales **Question:** What would MarshallCo's *Net Accounts Receivable* for FY 2020 be?

    (a) $900k

    (b) $1m

(c) $800k

(d) $100k

(e) None of the other answers.

11. Our company accounts for bad debts / receivables using the **allowance method**, assuming 10% of outstanding accounts will be uncollectible. We began FY2020 with a balance of $150k in Accounts Receivable and $15k in our Allowance for Doubtful Accounts. During FY2020, we made an additional $30k in credit sales, collected $20k on accounts from past credit sales, and wrote off $10k in accounts. What would be our FY2020 *Bad Debt Expense*?

    (a) $2k

    (b) $3k

    (c) $4k

    (d) Not enough information.

    (e) None of the other answers.

12. Our company accounts for bad debts / receivables using the **allowance method**, assuming 10% of outstanding accounts will be uncollectible. We began FY2020 with a balance of $150k in Accounts Receivable and $15k in our Allowance for Doubtful Accounts. During FY2020, we made an additional $30k in credit sales, collected $20k on accounts from past credit sales, and wrote off $10k in accounts. What would be our FY2020 *Bad Debt Expense*?

    (a) $2k

    (b) $3k

    (c) $4k

    (d) Not enough information.

    (e) None of the other answers.

13. Our company accounts for bad debts / receivables using the **allowance method**, assuming 10% of outstanding accounts will be uncollectible. We began FY2020 with a balance of $200k in Accounts Receivable. During FY2020, we wrote off $15k in accounts, and ended the period with total *Accounts Receivable* of $220k. What would be our FY2020 *Bad Debt Expense*?

(a) $2k

(b) $3k

(c) $4k

(d) Not enough information.

(e) None of the other answers.

14. Our company accounts for bad debts / receivables using the **allowance method**, assuming 10% of outstanding accounts will be uncollectible. We began FY2020 with a balance of $300k in Accounts Receivable, and $30k in our Allowance for Doubtful Accounts. We ended the FY2020 period with total *Accounts Receivable* of $220k. What would be our FY2020 *Bad Debt Expense*?

(a) $2k

(b) $3k

(c) $4k

(d) Not enough information.

(e) None of the other answers.

15. Our company uses the Allowance method, and estimates the Allowance using the *aging-of-receivables* method. We began FY2020 with a balance in the *Allowance* of $20k. We end FY2020 with $50k in Accounts outstanding less than 30 days, and $40k in Accounts outstanding 30 days or more. We assume 10% of the former category and 15% of the latter category will be uncollectible. What will be our *Net Accounts Receivable* for FY2020?

(a) $2k

(b) $3k

(c) $4k

(d) Not enough information.

(e) None of the other answers.

16. Our company accounts for bad debts / receivables using the **percentage-of credit-sales method**, assuming 15% of credit sales will be uncollectible. We began FY2020 with a balance of $150k in Accounts Receivable and $30k in our Allowance for Doubtful Accounts. During FY2020, we made an additional $100k in credit sales, and collected $60k on accounts from past credit sales. Customers with accounts totaling $20k declared bankruptcy. What would be our FY2020 Bad Debt Expense?

    (a) $11k

    (b) **$15k**

    (c) $28.5k

    (d) Not enough information.

    (e) None of the other answers.

17. Our company accounts for bad debts / receivables using the **allowance method**, assuming 10% of outstanding accounts will be uncollectible. We began FY2020 with a balance of $50k in Accounts Receivable and $5k in our Allowance for Doubtful Accounts. During FY2020, we made an additional $30k in credit sales, collected $20k on accounts from past credit sales, and wrote off $3k in accounts. What would be our FY2020 *Bad Debt Expense*?

    (a) $2k

    (b) $3k

    (c) $4k

    (d) Not enough information.

    (e) **None of the other answers.**

18. Under the percentage-of-credit-sales method, all else equal, the greater our collections from past period's credit sales, the [higher / lower / no change] will be our Bad Debt Expense in this period?

    (a) Higher

    (b) Lower

    (c) **Unchanged**

(d) Not enough information.

(e) None of the other answers.

19. Under the percentage-of-credit-sales method, all else equal, the greater our write-offs of past period's credit sales, the [higher / lower / no change] will be our Bad Debt Expense in this period?

(a) Higher

(b) Lower

(c) Unchanged

(d) Not enough information.

(e) None of the other answers.

20. Under the Allowance method, all else equal, the greater our collections from past period's credit sales during this period, the [higher / lower / no change] will be our Bad Debt Expense in this period?

(a) Higher

(b) **Lower**

(c) Unchanged

(d) Not enough information.

(e) None of the other answers.

21. Under the Allowance method, all else equal, the lower our collections from past period's credit sales during this period, the [higher / lower / no change] will be our Bad Debt Expense in this period?

(a) Higher

(b) Lower

(c) Unchanged

(d) Not enough information.

(e) None of the other answers.

22. Under the Allowance method, all else equal, the greater our writeoffs of past period's credit sales during this period, the [higher / lower / no change] will be our Bad Debt Expense in this period?

    (a) Higher
    (b) Lower
    (c) Unchanged
    (d) Not enough information.
    (e) None of the other answers.

23. Under the Allowance method, all else equal, the lower our writeoffs of past period's credit sales during this period, the [higher / lower / no change] will be our Bad Debt Expense in this period?

    (a) Higher
    (b) Lower
    (c) Unchanged
    (d) Not enough information.
    (e) None of the other answers.

24. Trojan Company uses the Balance Sheet / Allowance Method for accounting for bad debts, assuming that 14% of outstanding receivables will not be collectible. The balance of Allowance for Uncollectible Accounts is $380 (credit) before adjustment on December 31, 2019. The balance of Accounts Receivable is $34,000. What is the adjusting entry that Trojan Company should record for Allowance for Uncollectible Accounts?

    (a) Debit Allowance for Uncollectible Accounts 4,380; Credit Bad Debt Expense 4,380
    (b) Debit Bad Debt Expense 5,140; Credit Allowance for Uncollectible Accounts 5,140
    (c) Debit Allowance for Uncollectible Accounts 5,140; Credit Bad Debt Expense 5,140
    (d) Debit Bad Debt Expense 4,380; Credit Allowance for Uncollectible Accounts 4,380
    (e) None of the answers are correct

A.8.2 Practice Problems: Open Prompts

- Journalize the following transactions—both the external transactions and the implied related adjusting entries at the end of the reporting period—using the **percentage-of-credit sales** method, assuming 15% of credit sales will be written off. (Assume, as usual and by default, annual calendar-year reporting)
  - February 15, 2022: Sell to Customer A for $100k in cash.
  - March 28, 2022: Sell to Customer B for $10k on account.
  - September 25, 2022: Sell to Customer C for $120k on account.
  - November 11, 2022: Customer B pays off their account in full.
  - December 31, 2022: End of the year, close the books!
  - February 15, 2023: Customer C pays off their account in full.
  - May 11, 2023: Sell to Customer D for $5k on account.
  - September 11, 2023: Sell to Customer E for $80k on account.
  - November 11, 2023: Customer D declares bankruptcy—we realize we'll never collect on their account.
  - December 31, 2023: End of the year, close the books!

- Now, journalize the same transactions—both the external transactions and the implied related adjusting entries at the end of the reporting period—using the **Allowance Method**, assuming 10% of outstanding accounts will not be collected.

- Our company accounts for bad debts / receivables using the *percentage-of-credit-sales method*, assuming 10% of credit sales will be uncollectible. We began FY2020 with a balance of $100k in *Accounts Receivable* and $20k in our *Allowance for Doubtful Accounts*. During FY2020, we made an additional $50k in credit sales, and collected $40k on accounts from past credit sales. Customers with accounts totaling $10k declared bankruptcy. What would be our FY2020 *Bad Debt Expense*?
  - **Answer: 10% * $50k = $5k, full stop. Everything else is a distraction.**

- Our company accounts for bad debts / receivables using the *allowance method*, assuming 10% of outstanding accounts will be uncollectible. We began FY2020 with a balance of $100k in *Accounts Receivable* and $10k in our *Allowance for*

Doubtful Accounts. During FY2020, we made an additional $50k in credit sales, and collected $40k on accounts from past credit sales, and wrote off $5k in accounts. What would be our FY2020 *Bad Debt Expense*?

  - **Answer**: Make the T-accounts to guide you through this. We started with $100k in A/R, then made an additional $50k in credit sales, and collected $40k, and wrote off $5k. So, our ending balance of A/R is $105k. So, our ending balance of the *Allowance* must be 10% * $105k = $10.5k. Our beginning balance of the *Allowance* at the start of the period *was* $10k, but we "used up" $5k of that in the writeoff. So, prior to adjustment, the balance of the *Allowance* is $5k. So, the adjustment to the *Allowance* must be $5.5k ($10.5k - $5k), which is our *Bad Debt Expense* by definition. Again, I solved this in words, but I recommend you track your work with T-accounts.

- Under the Allowance method, when we write off an account worth $10k, what is the correct journal entry?

- Our company uses the Allowance method, and estimates the Allowance using the *aging-of-receivables* method. We began FY2020 with a balance in the *Allowance* of $20k. We end FY2020 with $50k in Accounts outstanding less than 30 days, and $40k in Accounts outstanding 30 days or more. We assume 10% of the former category and 15% of the latter category will be uncollectible. What will be our *Net Accounts Receivable* for FY2020?

  - **Answer**: *Total* Accounts Receivable is $90k. Of the $50k outstanding less than 30 days, we assume 10%, or $5k total is uncollectible; of the $40k outstanding more than 30 days, we assume 15%, or $6k total, is uncollectible. So, $11k is uncollectible. ***Net*** *Accounts Receivable* is $90k-$11k = $79k.

A.8.3 Essay and Discussion Questions

- Compare and contrast the Percentage-of-Credit-Sales Method and the Allowance Method for accounting for receivables. What are the strengths and limitations of each approach? Why is one of them called the "Income Statement method" and the other called the "Balance Sheet method"? Which do you think is the better approach overall?

- Under the *Allowance Method*, when we "write off" an account during the reporting period, we don't debit *Bad Debt Expense* right away. And yet, all else equal,

the higher our writeoffs during the period, the higher our ultimate *Bad Debt Expense* will be. Explain how this can be, and precisely how this works.

A.9 Chapter 9

A.9.1 Practice Problems: MCQ's

- From our company's perspective, the interest we owe, prior to the date on which we actually pay it, is a(n):
  - (A.) accrued revenue
  - (B.) deferred revenue
  - **(C.)** accrued expense
  - (D.) deferred expense
  - (E.) None of the other answers

- Which of the below is the best characterization of what corporate bankruptcy is?
  - (A.) the death of the corporation
  - (B.) a legal process for publicly shaming and condemning bad companies, so that they cannot continue to do their bad stuff
  - (C.) the process by which the government steps in and pays the debts of corporations
  - (D.) the legal process for deciding what to do (and especially, reorganizing) when a corporation simply cannot meet its obligations

A.9.2 Practice Problems: Open Prompts

- Suppose that on September 1, 2022, our company receives a $10,000 loan, with an 8% interest rate, paid annually, and a 3-year maturity, from a bank. Journalize each external transaction and adjusting entry, over the entire life of this loan (that is, until the maturity date on which we pay down the when we pay down the principal and face value).

A.9.3 Essay and Discussion Questions

- In your opinion, does it ever make sense for the government to "bail out" companies that are at risk of bankruptcy? If not, why? If so, when and why?

A.10 Chapter 10

A.10.1 Practice Problems: MCQ's

1. Consider the following scenario: In FY2020, MarshallCo starts its life, and has the following events related to the purchase and sale of *Inventory*. January 1: Purchases 100 units of Inventory for $10 each. January 5: Sells 50 units of Inventory for $20 each. January 10th: Purchases 100 units of Inventory for $15 each. January 12: Sells 120 units of Inventory for $20 each. **Calculate the Gross Profit for the January 12 sale, assuming FIFO.**

   (a) $0k

   (b) $100k

   (c) $200k

   (d) $900k

   (e) None of the other answers.

2. Consider the following scenario: In FY2020, MarshallCo starts its life, and has the following events related to the purchase and sale of *Inventory*. January 1: Purchases 100 units of Inventory for $10 each. January 5: Sells 50 units of Inventory for $20 each. January 10th: Purchases 100 units of Inventory for $15 each. January 12: Sells 120 units of Inventory for $20 each. **Calculate the COGS Expense for the January 12 sale, assuming LIFO.**

   (a) $0k

   (b) $100k

   (c) $200k

   (d) $900k

   (e) None of the other answers.

3. If our inventory costs are rising monotonically (that is, increasing and only increasing) over time, which inventory costing method will cause us to report the highest *Net Income*?

   (a) FIFO

   (b) LIFO

(c) Weighted Average Cost

(d) Specific Identification

(e) Not enough information / ambiguous

4. Which method is the most commonly used by U.S. public companies for financial reporting?

   (a) FIFO

   (b) LIFO

   (c) Weighted Average Cost

   (d) Specific Identification

   (e) None of the above

5. At the end of FY2020, our company reported $100k in *Inventory*. Over FY2021, we spent another $80k purchasing *Inventory*. At the end of FY2021, we reported $70k in *Inventory* on our Balance Sheet. What was our company's *Cost of Goods Sold* for FY2021?

   (a) $70k

   (b) $90k

   (c) $110k

   (d) Not enough information

   (e) None of the other answers

6. A company reports this *Income Statement:*

Total Revenues	$120k
Cost of Goods Sold	($40k)
Salaries Expense	($20k)
Rent Expense	($10k)
Gain upon Sale of Equipment	$5k
Interest Expense	($10k)
Tax Expense	($9k)
Net Income	**$36k**

   What is its *Operating Income*?

(a) 36k

(b) 80k

(c) 60k

(d) 55k

(e) 50k

(f) None of the other answers.

7. **Setup:** Suppose our company starts its life in FY2022, and, on January 10, purchases **100 units** from a wholesaler at a price of **$10,000** and separately pays **$1,000** to ship the goods to our store. Then, on January 25, we sell 25 units. What would be our *Inventory* **balance** after the January 25 sale?

   (a) $7,500

   (b) $7,750

   (c) $7,250

   (d) Not enough information.

   (e) None of the other answers.

8. Which inventory costing method is characterized as the "income statement method"?

   (a) FIFO

   (b) LIFO

   (c) Weighted Average Cost

   (d) Specific Identification

   (e) Not enough information / ambiguous

9. **Setup:** *Inventory (A)* is an asset, and *Cost of Goods Sold (COGS)* is its related expense. At the end of FY2020, our company reported $100k in *Inventory*. Over FY2021, it spent another $80k purchasing *Inventory*. At the end of FY2021, it reported $70k in *Inventory*. What was our company's *Cost of Goods Sold* for FY2021?

   (a) (A.) $70k

   (b) (B.) $90k

(c) **(C.)** $110k

(d) (D.) Not enough information

(e) (E.) None of the other answers.

10. Which of the following is a reason why many companies elect to use the LIFO method for Inventory costing?

(a) (A.) To lower their tax burden by showing lower expenses.

(b) (B.) To lower their tax burden by showing lower tax profit.

(c) (C.) To show higher GAAP profit, as inventory costs rise over time due to inflation.

(d) (D.) Multiple of the other answers.

(e) (E.) None of the other answers.

11. MattCorp is a retailer. At the end of FY2015, MattCorp reported Inventory of $100k. At the end of FY2016, MattCorp reported Inventory of $80k. Additionally, we are able to determine that MattCorp earned Revenue of $90k and Gross Profit of $60k over FY2016. How much did MattCorp purchase in Inventory over 2016?

(a) **(A.)** $10k

(b) (B.) None of the other answers.

(c) (C.) $30k

(d) (D.) $60k

(e) (E.) Not enough information. Depends on Inventory Costing Method (FIFO vs. LIFO, etc.)

12. A company reports Revenue of $100K, COGS of $60k, Other Operating Expenses of $20k, Interest Expense of $10k, and Tax Expense of $4k, for a bottom-line income of $6k. What is its Gross Profit Margin?

(a) (A.) 60%

(b) **(B.)** 40%

(c) (C.) 20%

(d) (D.) 6%

(e) (E.) None of the other answers are correct

A.10.2 Practice Problems: Open Prompts

1. MattCorp starts its life in FY2021, and makes the following Inventory purchases and Sales, and only these.

   Purchases: January 20, pays $10k for 100 units, and an additional $500 for shipping. March 15, pays $8k for 60 units, and an additional $300 for shipping.

   Sales: February 15, sells 50 units.

   Question: What would be the *COGS* MattCorp would record upon the February 15th sale, assuming **FIFO**.

2. MattCorp starts its life in FY2021, and makes the following Inventory purchases and Sales, and only these. **Purchases**: January 15, 2000 units at $30 each; March 15, 2000 units at $40 each; June 15, 1000 units at $45 each. **Sales**: March 20th, 3000 units, sold for $80 each; July 4th, 1500 units sold for $80 each. Calculate the *Gross Profit* for the July 4th sale, using the **LIFO** method.

3. MattCorp starts its life in FY2021, and makes the following Inventory purchases and Sales, and only these. **Purchases**: January 15, 2000 units at $30 each; March 15, 2000 units at $40 each; June 15, 1000 units at $45 each. **Sales**: March 20th, 3000 units, sold for $80 each; July 4th, 1500 units sold for $80 each. Calculate *COGS* for the July 4th sale, using the **LIFO** method.

4. MattCorp is a retailer. At the end of Fiscal Year 2015, MattCorp reported Inventory of $100k. At the end of Fiscal Year 2016, MattCorp reported Revenue of $100k and Inventory of $80k. We are additionally able to determine that MattCorp spent $40k on purchasing inventory during FY 2016. What was MattCorp's Gross Profit for FY 2016?

5. A company reports this *Income Statement:*

Total Revenues	$120k
Cost of Goods Sold	($40k)
Salaries Expense	($20k)
Rent Expense	($10k)
Loss (upon Sale of Equipment)	($5k)
Interest Expense	($10k)
Tax Expense	($9k)
Net Income	**$26k**

What is its *Operating Income*? **Answer:$50k.**

A.10.3 Essay and Discussion Questions

- What are the factors companies consider when they choose between LIFO and FIFO? E.g., what are the normative arguments about which method makes the most sense, economically? And which method would financially self-interested companies choose if their costs are rising over time, and why?

A.11 Chapter 11

A.11.1 Practice Problems: MCQ's

1. MattCorp purchases a factory from a seller for a price of $10m. MattCorp pays fees of $500k to a law firm to secure title; pays another $400k commission to the realtor who brokered the deal; pays its first annual state property tax of $100k; pays an annual $50k insurance premium to insure the Equipment; and salvages copper from the equipment that it then sells for $250k in Cash. What would be the initial carrying value of the Equipment on MattCorp's books (i.e., after all these events but before any subsequent depreciation expense)?

   (a) $10m

   (b) $10.6m

   (c) $10.7m

   (d) $10.9m

   (e) None of the other answers.

2. **Setup:** On July 1, 2020, our company bought **Equipment** for $20m, and assumed a useful life of 10 years, zero salvage value, and straight-line depreciation. On December 31, 2024, we sold the Equipment, and recorded a $2m *Loss* upon the sale. What was the sale price?

   (a) $2m

   (b) $10m

   (c) $12m

   (d) $14m

   (e) None of the other answers.

3. Which of the below is the interpretation of a *Loss* upon the sale of a long-term fixed asset?

   (a) The accounting depreciation we assumed was greater than the economic depreciation

   (b) The accounting depreciation we assumed was less than the economic depreciation

(c) Our company lost economic value as a result of the transaction

(d) Multiple other answers

(e) None of the other answers.

4. Which of the following are true of *Gains* in accounting?

(a) We would have a *Gain* if we determined that the fair value of our *Equipment* is greater than book value

(b) They are reported on the Income Statement

(c) They are *Revenues*

(d) Multiple other answers

(e) None of the other answers.

5. Which of the following is a reason why a company might elect to use an Accelerated Depreciation method for depreciating its asset for its GAAP financial reporting?

(a) To show higher profitability sooner, rather than later.

(b) To show higher expenses, for the tax advantages.

(c) To "store up" the ability to yield a 'Gain' in the future if/when desired, for "earnings management" purposes.

(d) Multiple other answers.

(e) None of the other answers.

6. Our company purchases a piece of Equipment for $4m on July 1, 2020. In FY2020, we record a *Depreciation Expense* of $.5m on the Equipment. If our company is using an accelerated depreciation method, which of the below would be a possible *Depreciation Expense* for FY2021?

(a) $.4m

(b) $.8m

(c) $1.2m

(d) Multiple other answers

(e) None of the other answers.

7. Do we amortize *Patents* and *Trademarks*, respectively?

   (a) Yes and yes

   (b) Yes and no

   (c) No and yes

   (d) No and no

   (e) None of the other answers

8. Company A developed a *Patent* internally, through hiring scientists 10 years ago and paying them to do research—the *Patent* was granted by the PTO 5 years ago ("build" strategy), at which point Company B divested its research division and began selling the product. Company B competes in the same product market, and is very similar, but instead purchased its *Patent* 5 years ago from a startup (pursuing a "buy" strategy), and began selling the product. All else equal, based on this information alone, would we expect Company A have [higher / lower / the same] *ROE* compared to Company B, at this point?

   (a) Higher

   (b) Lower

   (c) The same

   (d) Not enough information

   (e) None of the other answers

9. MattCorp purchases Equipment from a seller for a price of $10m. MattCorp pays legal fees of $500k to secure title, as a part of the transaction; pays back taxes of $250k in order to begin operating the equipment in the state; pays a recurring annual $1m insurance premium to insure the Equipment; and salvages scrap materials from the equipment that it then sells for $1m in Cash. What would be the initial carrying value of the Equipment on MattCorp's books (i.e., after all these events but before any subsequent depreciation expense).

   (a) $10.25m

   (b) $9.75m

(c) $10m

(d) $10.85m

(e) None of the other answers.

10. On January 1, 2017, Joe's Inc. bought a machine for $100,000. The company assumed a useful life of 20 years, a salvage/residual value of $20,000, and straight-line depreciation. On January 1, 2022, Joe's Inc. sold the machine and recorded a $10,000 Gain upon sale. What was the sale price of the machine?

(a) $10,000

(b) $70,000

(c) **$90,000**

(d) $110,000

(e) None of the answers are correct

11. On July 1, 2012, Topanaga Corp bought a machine for $200k. On January 1, 2017, it sold it for $165k, and recorded a $10k Gain upon the sale. Topanga Corp always used straight-line depreciation for its long-term tangible assets, and never recorded an impairment on this asset. What was Topanga Corp's FY2016 depreciation expense for this machine?

(a) $5k

(b) **$10k**

(c) $55k

(d) Not enough information

(e) None of the answers are correct

12. Our company has only one item in its Equipment account, and we use an accelerated depreciation methodology. In FY2017, the book value of the Equipment was $900k. In FY2018, its book value was $600k. (There was no impairment loss.) Based on this information alone, which of the below is a possible Depreciation Expense for the asset in FY2019?

(a) None of the other answers.

(b) **$200k**

(c) $400k

(d) $500k

(e) Multiple of the other answers.

13. Our company owns several different patents. At the end of FY2019, our company reported Patents (at book value) of $900k. Over FY2020, we recorded total Amortization Expense of $200k, recorded a $300k impairment Loss on one of our patents, and purchased an additional Patent for $100k. What would be the book value of our Patents on our FY2020 Balance Sheet?

(a) None: Intangible asset not recorded.

(b) $800k

(c) **(C.)** $500k

(d) $700k

(e) None of the other answers.

14. Which of the following is a reason why a company might elect to use an Accelerated Depreciation method for depreciating its asset for its GAAP financial reporting?

(a) To show higher profitability sooner, rather than later.

(b) To show higher expenses, for the tax advantages.

(c) To "store up" the ability to yield a 'Gain' in the future if/when desired, for "earnings management" purposes.

(d) Multiple other answers.

(e) None of the other answers.

15. Topanga Corporation purchased a new automotive manufacturing plant on 50 acres of land. The building is being depreciated using straight line depreciation. What method should the *Land* be depreciated with?

(a) Straight Line

(b) Double Declining

(c) Units of production

(d) Sum of years digits

(e) None of the other answers

16. Tommy Corporation sold its two-year-old machine to Trojan Inc. for $580,000. The machine originally cost $778,000, had an estimated useful life of 10 years, and a salvage value of $48,000. Assuming the machine was depreciated using straight-line depreciation, what was the gain/loss on sale of the machine at the end of the second year?

(a) Gain of $198,000

(b) Loss of $198,000

(c) Loss of $52,000

(d) Gain of $52,000

(e) None of the answers are correct

17. Glacier Company purchased equipment for $30,000. The equipment is estimated to last five years with the residual value at the end of the service life expected to be $3,100. The equipment was in operation for 3,100 hours in the first year and the company expects the equipment to operate a total of 20,000 hours. What is the *Depreciation Expense* for the first year of the equipment's use, assuming the use of activity-based costing?

(a) $6,750

(b) $10,000

(c) $4,185

(d) Not enough information.

(e) None of the answers are correct

A.11.2 Practice Problems: Open Prompts

- Our company purchases a piece of *Equipment* for $25m in FY2020. We expect the equipment to produce 500k units over its useful life, and have zero salvage/residual value at the end. We use **activity-based costing** for this asset. During FY2020, its produces 150k units; during FY2021, it produces 200k units; and during FY2022

it produces 50k units, before we sell it for $4m. What is the *Gain* / *Loss* upon the sale?

- Our company purchases a plot of *Land* for $10m. We expect to use it for the next 20 years. In general, our company uses *straight-line depreciation* for all of our depreciable assets. What would be the annual *Depreciation Expense* recorded on the *Land* each year?

A.11.3 Essay and Discussion Questions

- What is a "gain" in accounting? Is it good or bad news? Does it indicate that the company did a good or bad decision or job selling an asset? Why or why not? If it's not good news, why is it added to Net Income / Shareholders' Equity? What is the economic interpretation of a Gain upon sale of an asset?

- It's very common for people to claim that "accounting does not recognize the value of intangible assets." What do you make of this statement? Is it true, false, true-ish, and why, and what are the implications?

- We recently learned that when companies incur costs to get their assets ready for use, they capitalize those costs (add them to the asset balance). This would seem odd to accounting novices. Can you explain the logic of this—in particular, can you relate it to the core accounting principle of matching? (Remember the discussion of Shipping and *Inventory* and subsequent *COGS*.)

A.12 Chapter 12

A.12.1 Practice Problems: MCQ's

1. Which of the below is one of the definitions of "fair value."

   (a) The price that maximizes overall social well-being

   (b) Fundamental value, i.e. discounted expected future cash flows

   (c) The historical cost less accumulated depreciation

   (d) Multiple other answers

   (e) None of the other answers

2. **Scenario:** Suppose our company buys **equipment and the property** it is on, for $1 million. Our appraisal/valuation experts and advisers estimate the "fair value" of the **Equipment** and **Land** to be **$660k** and **$440k**, **respectively**. What would be the journal entry for this transaction?

   (a) Debit Equipment $440k, Debit Land $660k; Credit Cash $1.1m

   (b) Debit Equipment $440k, Debit Land $660k; Credit Cash $1m, Credit Gain $100k

   (c) Debit Equipment $400k, Debit Land $600k; Credit Cash $1m

   (d) Debit Equipment $500k, Debit Land $500k; Credit Cash $1m

   (e) None of the other answers

3. Our company owns several different patents. At the end of FY2019, our company reported Patents (at book value) of $900k. During FY2020, we recorded a $300k impairment Loss on one of our patents, and recorded total *Amortization* on our patents of $200k. The total book value of Patents on our FY2020 Balance Sheet was $700k. How much did we purchase in *Patents* over the period?

   (a) $200k

   (b) $300k

   (c) $400k

   (d) $700k

   (e) None of the other answers.

4. Early on in the pandemic, our company purchased the patent for Remdesivir, an anti-viral drug believed to have some efficacy against SARS-CoV-2. Its current book value is $10m. Due to the development and rollout of Paxlovid, another drug with apparently higher efficacy, we now worry that our patent may be impaired. Our financial experts do an analysis, and determine that the expected net cash flow from the asset is $11m and the discounted expected future cash flows are $10.2 million. What journal entry would we make as a result?

   (a) Debit Loss $.2m; Credit Patents $.2m

   (b) Debit Patent $.2m; Credit Gain $.2m

   (c) Debit Cash $10.2m; Credit Gain $.2m; Credit Patents $.2m

   (d) No journal entry as a result.

   (e) None of the other answers.

5. Which of the following would be implicitly "baked in" to Goodwill after an acquisition?

   (a) The value of the target's outstanding *Accounts Receivable*

   (b) The value of the target's *Patents*

   (c) The value of the target's *Trademarks*

   (d) Multiple other answers.

   (e) None of the other answers.

6. ExpoCorp makes an acquisition of SimpleCorp, paying $13m. Immediately prior to the acquisition, SimpleCorp had the following assets and liabilities, at the following book values. Prepaid Rent: $2m, Trademarks: $1, Patents: $0m, Deferred Revenue: $1m, Salaries Payable: $1m, Notes Payable: $3m. Our internal valuation experts estimate that the fair value of SimpleCorps's Trademarks and Patents, respectively, are $4m and $3m. (And the fair value of all other identifiable assets and liabilities is the same as their book value.) What is the *Goodwill* we would record upon the acquisition?

   (a) $5m

   (b) $3m

(c) $8m

(d) $2m

(e) None of the other answers.

7. Our company purchases *Land* from a seller for non-cash consideration, exchanging 1 million shares of our *Common Stock*. Our company is publicly traded and, on the date of the deal, our stock price is $50 per share. What would be the journal entry for this transaction?

   (a) Debit Cash $50m, Credit Common Stock $50m

   (b) Debit *Land*

   (c) $8m

   (d) $2m

   (e) None—no cash purchase price.

8. Our company owns a plot of *Land* in Malibu that is currently on our books for $3m. However, due to a historic drought and unprecedented fire risk, we worry the area has become less desirable, and the *Land* may be impaired. Or valuation experts test for impairment, and determine that the expected expected net cash cash flows from the plot of *Land* are $2.6m, and the new fair value of the property is $2.2m. What is the journal entry we would make after determining this?

   (a) Debit Depreciation Expense $.8m; Credit Land $.8m

   (b) Debit Loss $.8m; Credit Land $.8m

   (c) Debit Loss $.4m; Credit Land $.4m

   (d) None, because you do not depreciate *Land*

   (e) None of the above are correct.

9. Early on in the pandemic, our company purchased the patent for Remdesivir, an anti-viral drug believed to have some efficacy against SARS-CoV-2. Its current book value is $10m. Due to the development and rollout of unexpectedly-effective vaccines, we now worry that our patent may be impaired. Our financial experts do an analysis, and determine that the expected net cash flow from the asset is $11m and the discounted expected future cash flows are $10.2 million. What journal entry would we make as a result?

(a) Debit Loss $.2m; Credit Patents $.2m

(b) Debit Patent $.2m; Credit Gain $.2m

(c) Debit Cash $10.2m; Credit Gain $.2m; Credit Patents $.2m

(d) **No journal entry as a result.**

(e) None of the other answers.

10. Which of the following would be implicitly "baked in" to Goodwill after an acquisition?

(a) The value of the target's Patents.

(b) The value of intangibles such as Prepaid Rent.

(c) The value of the target's Trademarks.

(d) **The value of positive social-media buzz about the target's products.**

(e) Multiple other answers.

(f) None of the other answers.

11. ExpoCorp makes an acquisition of SimpleCorp, paying $13m. Immediately prior to the acquisition, SimpleCorp had the following assets and liabilities, at the following book values. Prepaid Rent: $2m, Trademarks: $1, Patents: $0m, Salaries Payable: $1m, Notes Payable: $3m. Our internal valuation experts estimate that the fair value of SimpleCorps's Trademarks and Patents, respectively, are $4m and $3m. (And the fair value of all other identifiable assets and liabilities is the same as their book value.) What is SimpleCorp's Net Identifiable Assets?

(a) $15m

(b) **$5m**

(c) $10m

(d) $8m

(e) None of the other answers.

12. ExpoCorp makes an acquisition of SimpleCorp, paying $13m. Immediately prior to the acquisition, SimpleCorp had the following assets and liabilities, at the following book values. Prepaid Rent: $2m, Trademarks: $1, Patents: $0m, Salaries Payable: $1m, Notes Payable: $3m. Our internal valuation experts estimate that the fair value of SimpleCorps's Trademarks and Patents, respectively, are $4m and $3m. (And the fair value of all other identifiable assets and liabilities is the same as their book value.) What is the *Goodwill* we would record upon the acquisition?

    (a) $5m

    (b) $3m

    (c) **$8m**

    (d) $2m

    (e) None of the other answers.

13. Which of the following is a scenario in which "fair value" could be used in accounting?

    (a) Basket purchase

    (b) Impairment

    (c) An acquisition

    (d) Multiple other answers

    (e) None of the other answers

A.12.2 Practice Problems: Open Prompts

- ExpoCorp makes an acquisition of SimpleCorp, paying $15m. Immediately prior to the acquisition, SimpleCorp had the following assets and liabilities, at the following book values. *Prepaid Rent: $2m*, *Trademarks: $0*, *Patents: $0m*, *Salaries Payable: $1m*, *Notes Payable: $8m*. Our valuation experts estimate that the fair value of SimpleCorps's *Trademarks* and *Patents*, respectively, are $3m and $2m. (And the fair value of all other identifiable assets and liabilities is the same as their book value.) What is the journal entry for the acquisition?

- Early on in the pandemic, our company purchased the patent for *Remdesivir*, an anti-viral drug believed to have some efficacy against SARS-CoV-2. Its current book value is $10m. Due to the development and rollout of unexpectedly-effective vaccines, we now believe that our patent may be *impaired*. Our financial experts do an analysis, and determine that the expected net cash flow from

the asset is $9.5m and the discounted expected future cash flows are $8 million. **What journal entry would we make** as a result?

A.12.3 Essay and Discussion Questions

- What is Goodwill in accounting? What is the technical definition? And what does it represent, conceptually? What are some examples of "economic assets" that would be implicitly captured by *Goodwill*?

- What do you make of Impairments in accounting? What are the accounting principles justifying them (i.e., why does the FASB have these rules in place)? Why do Wall Street analysts often "back out" impairment losses, in their "street" earnings?

- What is "fair value"? And when does it come into play in accounting, based on what we've seen so far in this class—and why?

A.13 Chapter 13

A.13.1 Practice Problems: MCQ's

1. We are considering purchasing an asset that promises to pay us $600 one year from today, and $10,600 two years from today. Based on our assessment of the riskiness, we determine that the appropriate interest rate is 6%. What is the present value of this asset? (Note: if your calculation is within a couple percent of one of the offered multiple choice answers, you should reasonably assume that's a rounding-error issue, and choose that answer.)

   (a) $10,566.03

   (b) $10,000.00

   (c) $8,833.96

   (d) None of the other answers.

   (e) Not enough information.

2. We are considering purchasing an asset called the "Wild Money Mystery Machine," which we expect will pay out $500k in cash one year from now, $420k ten years from now, and $1m twenty years from now. However, based on our uncertainty (i.e., the risk) we determine the appropriate interest rate on this investment is 12%. What is the present value of the Wild Money Machine, under this assumption?

   (a) $103k

   (b) $685k

   (c) An amount greater than $1m

   (d) Not enough information

   (e) None of the other answers

3. All else equal, the riskier an asset is, the [...] is its expected return.

   (a) Higher

   (b) Lower

   (c) Unchanged

   (d) Not enough information

(e) None of the other answers.

4. Holding the expected/promised future payments of an asset fixed, the *riskier* the asset, the [...] is its **present value**.

   (a) Higher
   (b) Lower
   (c) Unchanged
   (d) Not enough information
   (e) None of the other answers.

5. All else equal, the riskier some form of credit is (e.g. a loan or a bond), the [...] the market interest rate should be...

   (a) Higher
   (b) Lower
   (c) Unchanged
   (d) Not enough information
   (e) None of the other answers.

6. Based on the logic of NPV analysis, if we calculate that the NPV of some investment opportunity is greater than zero, we...

   (a) Should make the investment, because the present value of the benefits is greater than that of the costs...
   (b) Should not make the investment, because the present value of the benefits is less than that of the costs...
   (c) It's ambiguous / not enough information
   (d) Not enough information
   (e) None of the other answers.

A.13.2 Practice Problems: Open Prompts

- We are considering purchasing an asset that promises to pay us $600 one year from today, and $10,600 two years from today. Based on our assessment of the riskiness, we determine that the appropriate discount / interest rate is 5%. What is the **present value** of this asset?

- We are considering purchasing an asset that promises to pay us $600 one year from today, and $10,600 two years from today. Based on our assessment of the riskiness, we determine that the appropriate discount / interest rate is 7%. What is the **present value** of this asset?

- We are considering purchasing an asset that promises to pay us $600 one year from today, and $10,600 two years from today. Based on our assessment of the riskiness, we determine that the appropriate discount / interest rate is 5%. To purchase this asset today, we would need to pay $10,000. What is the **net present value** of this investment opportunity?

A.13.3 Essay and Discussion Questions

- Explain precisely *why* it is that high risk means high expected return.

A.14 Chapter 14

A.14.1 Practice Problems: MCQ's

1. Our company sells a bond with $100k face value, a three-year maturity, and a 7% coupon, paid annually. Upon issuance to the market, the market-implied interest rate on the bond is 5%. What was the present value / issuance price of the bond upon the sale?

   (a) $81.62k

   (b) $86.38k

   (c) $92.43k

   (d) $105.45k

   (e) None of the above.

2. Our company sells a bond with $100k face value, a three-year maturity, and a 7% coupon, paid annually. Upon issuance to the market, the market-implied interest rate on the bond is 8%. What was the present value / issuance price of the bond upon the sale?

   (a) $84.94k

   (b) $97.42k

   (c) $100k

   (d) $105.45k

   (e) None of the above.

3. Suppose a bond has a face value of $10k, and a coupon rate of 6%. But upon being issued to the market, the issuance price is only $9,200. Then, is the implied market interest rate equal to, greater than, or less than 6%?

   (a) Equal to 6%.

   (b) Greater than 6%.

   (c) Less than 6%.

   (d) It could be any of the above.

   (e) Not enough information.

4. Suppose a bond has a face value of $10k, and a coupon rate of 6%. But upon being issued to the market, the issuance price is $10,400. Then, is the implied market interest rate equal to, greater than, or less than 6%?

   (a) Equal to 6%.

   (b) Greater than 6%.

   (c) Less than 6%.

   (d) It could be any of the above.

   (e) Not enough information.

5. The *Discount on Bonds Payable* is a(n)...

   (a) asset account

   (b) contra-asset account

   (c) liability account

   (d) contra-liability account

   (e) Not enough information

6. The *Premium on Bonds Payable* is a(n)...

   (a) asset account

   (b) contra-asset account

   (c) liability account

   (d) contra-liability account

   (e) Not enough information

7. Is the following statement true or false? The carrying value of a bond is always equal to what its initial issuance price was.

   (a) true

   (b) false

8. Which of the below is the correct formula for determining the annual *Interest Expense* under the bond amortization method we learned in class?

   (a) $Interest\ Expense = Carrying\ Value \times Original\ Market\ Interest\ Rate$

   (b) $Interest\ Expense = Face\ Value \times Original\ Market\ Interest\ Rate$

   (c) $Interest\ Expense = Carrying\ Value \times Coupon\ Rate$

   (d) $Interest\ Expense = Face\ Value \times Coupon\ Rate$

   (e) None of the above.

9. Which of the below is the correct formula for determining the annual *coupon payments* for a typical bond?

   (a) $Annual\ Coupon\ Payment = Carrying\ Value \times Original\ Market\ Interest\ Rate$

   (b) $Annual\ Coupon\ Payment = Face\ Value \times Original\ Market\ Interest\ Rate$

   (c) $Annual\ Coupon\ Payment = Carrying\ Value \times Coupon\ Rate$

   (d) $Annual\ Coupon\ Payment = Face\ Value \times Coupon\ Rate$

   (e) None of the above.

10. If the market-implied interest rate on a bond upon issuance is *greater* than the coupon rate, the bond will...

    (a) ... issue at a “premium” to face value

    (b) ... issue at a “discount” to face value

    (c) ... not be issued at all by the corporation

    (d) ... find no buyers in the financial market

    (e) ... None of the other answers

11. If the market-implied interest rate on a bond upon issuance is *less* than the coupon rate, the bond will...

    (a) ... issue at a “premium” to face value

    (b) ... issue at a “discount” to face value

    (c) ... not be issued at all by the corporation

    (d) ... find no buyers in the financial market

(e) ... None of the other answers

12. For a bond issued at a premium, which of the following can we know to be true?

    (a) The cash interest payment will go down over time.

    (b) The cash interest payment will go up over time.

    (c) The interest expense recognized will go down over time.

    (d) The interest expense recognized will go up over time.

    (e) None of the other answers

13. For a bond issued at a discount, which of the following can we know to be true?

    (a) The cash interest payment will go down over time.

    (b) The cash interest payment will go up over time.

    (c) The interest expense recognized will go down over time.

    (d) The interest expense recognized will go up over time.

    (e) None of the other answers

14. Suppose our company issues a bond with a $10k face value, and a 6% coupon rate, paid annually. Upon sale to the market, it issues for a premium, with an implied market interest rate of 5%. What would be the annual cash interest payment on this bond?

    (a) $500

    (b) $600

    (c) Not enough information

    (d) None of the other answers.

15. Suppose our company issues a bond with a $10k face value, and a 6% coupon rate, paid annually. Upon sale to the market, **it issues for a premium**. Based on this information alone, would the annual *Interest Expense* be less than, equal to, or greater than $600?

    (a) Less than

(b) Equal to

(c) Greater than

(d) Not enough information

16. Based on the bond amortization method we learned in this class, what determines the *change* in the *Carrying Value* of a bond between periods?

(a) The change in the *market value* of the bond, trading in the bond market everyday

(b) The change in the interest rate assumptions of our financial experts

(c) The difference (plug) between the *Interest Expense* and the actual cash coupon payment

(d) The coupon payment by itself (i.e., $\Delta Carrying\ Value = Coupon\ Payment$)

(e) None of the above.

17. Suppose our company issues a bond with a $10k face value, and a 6% coupon rate, paid annually. Upon sale to the market, **it issues for a discount**. Based on this information alone, would the annual *Interest Expense* be less than, equal to, or greater than $600?

(a) Less than

(b) Equal to

(c) Greater than

(d) Not enough information

18. Suppose our company issues a bond with a 2-year maturity, a face value of $100k, and a coupon rate of 4%. The market-implied interest rate upon issuance is 5%. What was the bond's issuance price?

(a) $98.14k

(b) $107.44k

(c) $102.86k

(d) $94.33k

19. Suppose our company currently has a callable bond on our books with a face value of $10,000 and a call price of $10,000. The balance of the Premium on Bonds Payable account for that bond is $200. If we were to redeem the bond at the call price, we would have...:

    (a) A gain of $200

    (b) A loss of $200

    (c) A gain of $300

    (d) A loss of $300

    (e) None of the other answers

20. Suppose our company currently has a non-callable bond on our books with a face value of $10,000 and a carrying value of $10,200. We go to the market and repurchase it for $10,500. Then, we would have a...:

    (a) A gain of $300

    (b) A loss of $300

    (c) A gain of $500

    (d) A loss of $500

    (e) None of the other answers

21. We are given the following T-accounts related to a company's bond:

Bonds Payable (L)

Debits	Credits
	$10,000

Discount on B/P (-L)

Debits	Credits
$400	$100

What is the **Carrying value** of this bond?

(a) $9,500

(b) $9,600

(c) $9,700

(d) $10,000

(e) None of the other answers

22. We are given the following T-accounts related to a company's bond:

Bonds Payable (L)

Debits	Credits
	$10,000

Premium on BP (L)

Debits	Credits
$100	$400

What is the **Carrying value** of this bond?

(a) $9,500

(b) $9,600

(c) $9,700

(d) $10,000

(e) None of the other answers

23. Our company does annual, calendar-year reporting, and issues a bond with an annual coupon on January 1st 2021. The market issuance price is $95k, implying a market interest rate of 5%. What would be our Interest Expense from this bond for FY 2021 (i.e., the first year).

(a) $4750

(b) $5000

(c) $2500

(d) Not enough information, without the coupon rate

(e) None of the other answers

24. Our company does annual, calendar-year reporting, and issues a bond with an annual coupon on January 1st 2021. The market issuance price is $95k, implying a market interest rate of 5%. What would be our Interest Expense from this bond for FY 2022 (i.e., the second year).

(a) $4750

(b) $5000

(c) $2500

(d) Not enough information, without the coupon rate

(e) None of the other answers

25. All else equal, if our company were to issue a *callable* bond instead of (that is, as compared to the alternative of) a non-callable bond, the initial market interest rate on the bond would be...

(a) Higher, because the call feature means more risk for the bond *buyer*

(b) Lower, because callable bonds are better in every way

(c) Unchanged

(d) Not enough information / ambiguous

26. Which of the below is a condition that will trigger the requirement that a company capitalize a lease as a lease asset and liability?

(a) The lessee uses the leased asset as a part of its core operations and line of business.

(b) Multiple other answers.

(c) The lease will last exactly 50% of the useful life of the asset.

(d) The present value of the contracted lease payments is >90% of the fair value of the asset.

(e) None of the other answers

A.14.2 Practice Problems: Open Prompts

1. Suppose our company does annual, calendar-year reporting, Jan 1 to Jan 1, and issues the following bond on January 1st of 2021: Face value of $100k, 3-year maturity, coupon rate of 5%, paid annually. Upon issuance to the market, the market interest rate is 6%. Journalize the transactions for January 1 of 2021 (bond issuance), January 1 of 2022 (first annual interest payment / expense recognition), and January 1 of 2023 (second annual interest payment / expense recognition).

2. Suppose our company does annual, calendar-year reporting, Jan 1 to Jan 1, and issues the following bond on January 1st of 2021: Face value of $100k, 3-year maturity, coupon rate of 5%, paid annually. Upon issuance to the market, the market interest rate is 4%. Journalize the transactions for January 1 of 2021 (bond issuance), January 1 of 2022 (first annual interest payment / expense recognition), and January 1 of 2023 (second annual interest payment / expense recognition).

3. Suppose our company currently has a callable bond on our books with a face value of $10,000 and a call price of $10,000. The balance of the Discount on Bonds Payable account for that bond is $300. Suppose we redeem the bond at the **call price**. **Journalize this transaction**.

4. Suppose our company currently has a bond on our books with a face value of $10,000. The balance of the Discount on Bonds Payable account for that bond is $100. Suppose that we repurchase the bond in the bond market for the market price of $10,200. **Journalize this transaction.**

A.14.3 Essay and Discussion Questions

1. Explain what the whole 'bond amortization' process is all about. What is the basic problem that requires this elaborate accounting process, and what is the bond amortization algorithm trying to achieve/trying to account for? Why is it that, for a bond issued at a premium, the interest expense will be lower than the cash interest payments?

2. Why don't companies *only* issue callable bonds? That is, if a 'callable' bond is just like a non-callable bond, *plus* some extra 'optionality' for the firm, why would it ever choose to issue non-callable bonds?

3. Why would a bond investor be willing to buy a bond issued at a premium—that is, pay more today than the face value of the bond?

A.15 Chapter 15

A.15.1 Practice Problems: MCQ's

1. Our company issues 1000 shares Common Stock with a par value of $1 per share, for an issuance price of $20 per share. What would be our journal entry for this transaction?

   (a) Debit Cash $20k; Credit Common Stock $20k

   (b) Debit Cash $20k; Credit APIC $1k, Credit Common Stock $19k

   (c) Debit Cash $20k; Credit Common Stock $1k, Credit APIC $19k

   (d) Debit Common Stock $19k, Credit APIC $1k; Debit Cash $20k

   (e) None of the other answers

2. A company had previously repurchased 100 shares of its own Common Stock for $25 each. Now, the company re-sells those same shares for $30 each. Which of the below will result from this resale?

   (a) Trading Revenue of $3,000

   (b) A Gain of $500

   (c) A Loss of $500

   (d) An increase in APIC of $500

   (e) None of the other answers

3. A company had previously repurchased 100 shares of its own Common Stock for $25 each. Now, the company re-sells those same shares for $20 each. Which of the below will be in the journal entry for this resale?

   (a) A Gain of $500

   (b) A Loss of $500

   (c) A credit to APIC of $500

   (d) A debit to APIC $500

   (e) None of the other answers

4. ShreyCorp issues common stock with a *par value* of $.01 per share, and reports $1.5k in its *Common Stock* account. Based on this information alone, we can infer that ShreyCorp has...

   (a) 1.5k shares issued

   (b) 150k shares outstanding

   (c) 150k shares issued

   (d) Multiple other answers

   (e) None of the other answers

5. Suppose that we note that a company's Treasury Stock account has increased in magnitude from FY2019 to FY2020. This indicates a...

   (a) Financing cash inflow

   (b) Financing cash outflow

   (c) Investing cash inflow

   (d) Investing cash outflow

   (e) None of the other answers

6. Preferred Stock is categorized as...

   (a) Equity under GAAP

   (b) A liability under GAAP

   (c) A liability under IFRS

   (d) None of the other answers

   (e) Multiple other answers

7. When a company engages in a **stock split**, this...

   (a) increases its total ("book") Shareholders' Equity

   (b) decreases its total ("book") Shareholders' Equity

   (c) has no effect on its total ("book") Shareholders' Equity

   (d) it depends

8. StoneCorp issues Common Stock with a stated par value of $1 per share. Below are some selected amounts reported from StoneCorp's balance sheet for 2020 and 2021.

	2021	2020
Common Stock	$15k	$15k
Additional Paid-in Capital	$350k	$400k
(Treasury Stock)	$100k	$200k

Based on this information alone, which of the below must have happened?

(a) StoneCorp issued more *Common Stock* over FY2020

(b) StoneCorp repurchased shares over FY2020

(c) StoneCorp re-sold shares from its Treasury, for greater than their original repurchase price

(d) StoneCorp re-sold shares from its Treasury, for less than their original repurchase price

(e) None of the other answers

9. MarshallCo issues Common Stock with a stated par value of $1 per share. Below are some selected amounts reported from MarshallCo's balance sheet for 2018 and 2019.

	2019	2018
Common Stock	$10k	$10k
Additional Paid-in Capital	$900k	$900k
(Treasury Stock)	$200k	$0

Based on this information alone, which of the below can we determine:

(a) The number of shares outstanding as of the end of FY 2018

(b) The number of shares outstanding as of the end of FY2019

(c) The number of issued shares as of the end of FY 2019

(d) Two of the other answers

(e) Three of the other answers

A.15.2 Practice Problems: Open Prompts

- **Journalize the following sequence of transactions:**
  - January 15, 2022: Issue 10,000 shares of *Common Stock*, with $1 par value, for $100 each.
  - February 15, 2022: Repurchase 1,000 of those shares, for $80 each.
  - March 15, 2022: Re-sell 500 of *those* shares, for $120 each.

- **Journalize the following sequence of transactions:**
  - January 15, 2022: Issue 20,000 shares of *Common Stock*, with $.01 par value, for $150 each.
  - February 15, 2022: Repurchase 2,000 of those shares, for $200 each.
  - March 15, 2022: Re-sell 1,000 of *those* shares, for $160 each.

- JackCorp is a small company that provides tutoring to the most desperate and hopeless students. JackCorp's corporate charter states that its shares have a *par value* of $1 per share. At the beginning of FY2017, JackCorp has a balance of *Common Stock* of $10k, *Additional Paid-in Capital* of $990k, and and *Retained Earnings* of $250k–and no other Shareholders' Equitiy accounts. Over the FY2017 reporting period, JackCorp had the following transactions and only these:
  - Issued an additional 1000 shares, for $100 each.
  - Provided tutoring to students for cash, $200k.
  - Provided tutoring to students on account, $100k.
  - Repurchase 500 shares, for $120 each.
  - Received pre-payment from customers of $50k, for services to be rendered in FY2018.
  - Purchased Supplies for Cash, $30k.
  - Paid a utilities bill in cash, $20k.
  - Re-sell 200 of those shares, from the previous repurchase, for $150 each.
  - Paid dividends to stockholders, $40k.
- **What would JackCorp's total Shareholders' Equity be as of the end of FY2017?**

A.15.3 Essay and Discussion Questions

1. Do you think it makes more sense to think of Treasury Stock as a (negative) component of the company's paid-in capital or earned capital? Why? (Note, a good answer would first show the technical knowledge of what Treasury Stock is, how it arises on company's Balance Sheets, and what paid-in-capital and earned capital are, conceptually, before arguing your case...)

2. Do you think it makes more sense to think of *Preferred Stock* as a liability, or a part of shareholders' equity? Note that the IFRS and FASB take different views of this question. An excellent answer to this essay prompt would cover *why* reasonable/informed people (such as those two bodies) might disagree (i.e., why *a* case could be made for *either*) before expressing your position and argument.

A.16 Chapter 16

A.16.1 Practice Problems: MCQ's

1. Under the categorization scheme used for the **cash flow statement**, cash paid for salaries would be...

   (a) Operating

   (b) Investing

   (c) Financing

   (d) None of the other answers

2. Under the categorization scheme used for the **cash flow statement**, cash paid for *Inventory* would be...

   (a) Operating

   (b) Investing

   (c) Financing

   (d) None of the other answers

3. Under the categorization scheme used for the **cash flow statement**, cash paid (by our company) for *interest* on loans would be...

   (a) Operating

   (b) Investing

   (c) Financing

   (d) None of the other answers

4. Under the categorization scheme used for the **cash flow statement**, cash paid for *Equipment* would be...

   (a) Operating

   (b) Investing

   (c) Financing

   (d) None of the other answers

5. Under the categorization scheme used for the **cash flow statement**, cash paid for *Trademarks* would be...

   (a) Operating

   (b) Investing

   (c) Financing

   (d) None of the other answers

6. Under the **direct method** for the operating section of the cash flow statement, in adjusting Salaries Expenses to Cash Paid for Salaries, what would we do with the Salaries Payable reported on the Balance Sheet?

   (a) Add the total Salaries Payable for that year

   (b) Subtract total Salaries Payable for that year

   (c) Add the change in Salaries Payable between that year and the previous

   (d) Subtract the change in Salaries Payable between that year and the previous

   (e) None of the other answers

7. Under the **direct method** for the operating section of the cash flow statement, in adjusting Interest Expense to Cash Paid for Interest, what would we do with the Interest Payable reported on the Balance Sheet?

   (a) Add the total Interest Payable for that year

   (b) Subtract total Interest Payable for that year

   (c) Add the change in Interest Payable between that year and the previous

   (d) Subtract the change in Interest Payable between that year and the previous

   (e) None of the other answers

8. Under the **indirect method** for the operating section of the cash flow statement, what is the adjustment we make for *Accounts Receivable*?

   (a) Add the total Accounts Receivable for that year

   (b) Subtract total Accounts Receivable for that year

   (c) Add the change in Accounts Receivable between that year and the previous

(d) Subtract the change in Accounts Receivable between that year and the previous

(e) None of the other answers

9. Suppose that, unlike in the example used in the main text above, our company had a $10k *Gain* upon the sale of the land. Then, under the **indirect method** for the operating section of the cash flow statement, we would [add / subtract / no change] that $10k *Gain*?

(a) Add the $10k Gain

(b) Subtract the $10k Gain

(c) No adjustment for Gains under the indirect method

(d) None of the other answers

10. Under the **indirect method** for the operating section of the cash flow statement, what is the adjustment we make for *Salaries Payable*?

(a) Add the total *Salaries Payable* for that year

(b) Subtract total *Salaries Payable* for that year

(c) Add the change in *Salaries Payable* between that year and the previous

(d) Subtract the change in *Salaries Payable* between that year and the previous

(e) None of the other answers

11. Suppose that our company had Prepaid Rent reported as a current asset on our Balance Sheet. What adjustment would we make for it under the direct method, in adjusting *Rent Expense* to *Cash Paid for Rent*?

(a) Add the change in Prepaid Rent to *Rent Expense*

(b) Subtract the change in Prepaid Rent from *Rent Expense*

(c) Do nothing with Prepaid Rent.

(d) Debit Prepaid Rent

(e) None of the other answers

12. Suppose that our company had Prepaid Rent reported as a current asset on our Balance Sheet. What adjustment would we make for it under the indirect method for the operating section?

    (a) Add the change in Prepaid Rent

    (b) Subtract the change in Prepaid Rent.

    (c) Do nothing with Prepaid Rent.

    (d) Debit Prepaid Rent

    (e) None of the other answers

13. Which of the following could explain why a company might have a much higher *Net Income*, relative to its *Cash Flows from Operations* (i.e., high 'net accruals')?

    (a) A large decrease in *Accounts Receivable*–i.e., many accounts from past period's sales paid off

    (b) A large buildup in *Inventory*

    (c) Making major new investments in long-term assets like *Land* and *Trademarks*

    (d) Multiple other answer

    (e) None of the other answers

14. Suppose that every one of a company's Long-Term Liabilities and Shareholders' Equity accounts reported on its Balance Sheet is completely unchanged from last period to this period. The company earned Net Income of $20 over the period. What is its Net Cash Flows from Financing?

    (a) $0

    (b) –$20

    (c) +$20

    (d) Not enough information

    (e) None of the other answers.

15. In order to calculate the *Dividends* paid (a key financing cash outflow), we would...

(a) Look up the *Dividends* reported on the Income Statement

(b) Look up the *Dividends* reported on the Balance Sheet

(c) *Infer* the *Dividends* using the *Retained Earnings* identity

(d) Calculate the *Dividends* from the change in *Treasury Stock*

(e) None of the other answers

16. Suppose that we note that a company's Treasury Stock account has increased in magnitude from FY2019 to FY2020. This indicates a...

(a) Financing cash inflow

(b) Financing cash outflow

(c) Investing cash inflow

(d) Investing cash outflow

(e) None of the other answers

17. Suppose that we note that a company's *Bonds Payable* account (tracking the total face value of outstanding bonds) has increased in magnitude from FY2019 to FY2020. This indicates a...

(a) Financing cash inflow

(b) Financing cash outflow

(c) Investing cash inflow

(d) Investing cash outflow

(e) None of the other answers

18. Suppose that we note that a company's *Bonds Payable* account (tracking the total face value of outstanding bonds) has decreased in magnitude from FY2019 to FY2020. This indicates a...

(a) Financing cash inflow

(b) Financing cash outflow

(c) Investing cash inflow

(d) Investing cash outflow

(e) None of the other answers

19. Suppose that our company determines that our *Land* is impaired—triggering us to "write down" the *Land* and record a corresponding *Loss*. Then, that amount would be...

    (a) ... an operating cash inflow

    (b) ... an operating cash outflow

    (c) ... an investing cash inflow

    (d) ... an investing cash outflow

    (e) None of the above.

20. Suppose that our company's Balance Sheet reports a balance of *Cash* of $700k for FY 2020, and $950k for FY 2021. We have filled out the first two sections of the cash flow statement (correctly), and calculated that we had net operating cash flows of $200k and net investing cash flows of -$300k, for the period. Based on this information, what must our net financing cash flows be?

    (a) $250k

    (b) $300k

    (c) $350k

    (d) Not enough information

    (e) None of the other answers

21. Is the following statement true or false? A company can increase its Cash Flows From Operations by using a more aggressive depreciation method (i.e., increasing its *Depreciation Expense* for the year).

    (a) True

    (b) False

22. Is the following statement true or false? A company's *net cash from operations* may turn out to be different, depending on whether it uses the direct method or indirect method for the operating section.

(a) True

(b) False

A.16.2 Practice Problems: Open Prompts

1. Cash Flow Statement #1

   Fill out a cash flow statement, in its entirety, using the *indirect method* for the operating section, based on the income statement and balance sheets below.

Revenue:	**$200k**
COGS:	**$80k**
Salaries expenses:	**$40k**
Depreciation expenses:	**$30k**
Loss on sale of land:	**$5k**
Interest expense:	**$10k**
Income tax expense:	**$10k**
Net Income:	**$25k**

Table A.3: MattCorp Income Statement, For the Year Ended December 31, 2021:

	2021	**2020**
Assets:		
Cash	**$230k**	**$220k**
Accounts Receivable	**$90k**	**$70k**
Inventory	**$120k**	**$140k**
Investments	**$130k**	**$0**
Land	**$200k**	**$260k**
Equipment	**$250k**	**$200k**
Accumulated Depreciation	**$(80k)**	**$(50k)**
Total assets:	**$960k**	**$840k**
Liabilities:		
Accounts payable	**$80k**	**$90k**
Salaries payable	**$30k**	**$20k**
Interest payable	**$7k**	**$12k**
Income Tax payable	**$16k**	**$15k**
Notes payable	**$260k**	**$220k**
Shareholders' Equity:		
Common Stock	**$432k**	**$383k**
Retained Earnings	**$135k**	**$120k**
Total Liabilities and S.E.:	**$960k**	**$840k**

Table A.4: MattCorp Balance Sheets, Year Ended December 31:

Now, re-do the operating section for the income statement and balance sheet above, using the *direct method*.

2. Cash Flow Statement #2

   Fill out a cash flow statement, in its entirety, using the *indirect method* for the operating section, based on the income statement and balance sheets below.

Revenue:	**$100k**
COGS:	**$40k**
Salaries expenses:	**$20k**
Depreciation expenses:	**$15k**
Loss on sale of land:	**$5k**
Interest expense:	**$5k**
Income tax expense:	**$5k**
Net Income:	**$10k**

Table A.5: MattCorp Income Statement, For the Year Ended December 31, 2021:

	2021	**2020**
Assets:		
Cash	**$105k**	**$120k**
Accounts Receivable	**$45k**	**$35k**
Inventory	**$70k**	**$60k**
Investments	**$65k**	**$0**
Land	**$100k**	**$130k**
Equipment	**$125k**	**$100k**
Accumulated Depreciation	**$(40k)**	**$(25k)**
Total assets:	**$470k**	**$420k**
Liabilities:		
Accounts payable	**$40k**	**$45k**
Salaries payable	**$15k**	**$10k**
Interest payable	**$4k**	**$6k**
Income Tax payable	**$8k**	**$9k**
Notes payable	**$130k**	**$110k**
Shareholders' Equity:		
Common Stock	**$11k**	**$10k**
Additional Paid-in Capital	**$184k**	**$160k**
Retained Earnings	**$78k**	**$70**
Total Liabilities and S.E.:	**$470k**	**$420k**

Table A.6: MattCorp Balance Sheets, Year Ended December 31:

Now, re-do the operating section for the income statement and balance sheet above, using the *direct method*.

3. Cash Flow Statement #3:

   Fill out a cash flow statement, in its entirety, using the *indirect method* for the operating section, based on the income statement and balance sheets below. Note that, in the below, the years for the Balance Sheet are flipped (2020 in the left column, 2021 in the right column).

Revenue:	**$200k**
COGS:	**($80k)**
Salaries expenses:	**($40k)**
Depreciation expenses:	**($30k)**
Gain on sale of land:	**$10k**
Interest expense:	**($10k)**
Income tax expense:	**($10k)**
Net Income:	**$40k**

Table A.7: MattCorp Income Statement, For the Year Ended December 31, 2021:

	2020	**2021**
Assets:		
Cash	**$230k**	**$220k**
Accounts Receivable	**$90k**	**$70k**
Inventory	**$120k**	**$140k**
Land	**$260k**	**$200k**
Equipment	**$250k**	**$250k**
Accumulated Depreciation	**$(50k)**	**$(80k)**
Total assets:	**$X**	**$Y**
Liabilities:		
Accounts payable	**$80k**	**$90k**
Salaries payable	**$30k**	**$20k**
Interest payable	**$7k**	**$12k**
Income Tax payable	**$16k**	**$15k**
Notes payable	**$380k**	**$220k**
Shareholders' Equity:		
Common Stock	**$380k**	**$420k**
Retained Earnings	**$W**	**$Z**
Total Liabilities and S.E.:	**$X**	**$Y**

Table A.8: MattCorp Balance Sheets, Year Ended December 31:

Now, re-do the operating section using the *direct method*.

4. Open quantitative problem:

   (Note, you may use whatever method you prefer to get to the number being elicited in this question). FertittaCorp reports net income of $40 million. We are additionally given the following information: depreciation expense was $5 million and the company recorded a gain on the sale of land of $10 million (there were no other gains/losses or amortization). Finally, we are able to determine that accounts receivable decreased by $3m, accounts payable decreased by $4m, and inventory increased by $2m. Those were the only working capital accounts. What were FertittaCorp's **net cash flows from operations**?

5. Quantitative problem: Our company issues *Common Stock* with *par value* of $1 per share. We report the following amounts for 2020 and 2021:

	2020	**2021**
Common Stock	$1m	$1.5m
APIC	$10m	$40m
Treasury Stock	$0	$0

   What was our financing cash inflow from issuing *Common Stock* in FY2020?

A.16.3 Essay / Discussion Questions

- What explains the need and demand for the Statement of Cash Flows—that is, for companies to report their performance on a cash basis? That is, what are the defects or limitations in the Income Statement that make it an inadequate or imperfect way of measuring a company's performance? And how might the cash flow statement therefore help us? In short, what do we get from the Statement of Cash Flows?

- In your opinion, overall, does the Income Statement or the Cash Flow Statement provide the more informative perspective and measure of a company's performance over a period? Why?

- Suppose that a company has very solid Net Income but poor Cash Flows from Operations. What are some of the "usual suspects" that could account for this difference—that is, what kinds of accounts/activities, etc. could drive a large wedge between NI and CFO, and why?

A.16.4 Technical written-response questions

- Why is it that when calculating Cash paid to Suppliers (for Inventory) using the Direct Method (in the example in the homework and covered in class), we calculated it as... $Cash\ paid\ to\ suppliers\ (for\ Inventory) = COGS + \Delta Inventory - \Delta Accounts\ Payable$. Why do we make *two* adjustments in this case? What does each one do?

- Why is it that when calculating cash flow from operations (CFO) using the indirect method we add back *Depreciation Expense* and *Gains* at the start? Do *Depreciation Expenses* and *Gains* increase cash flows from operations? If not, why do we add them back at the start of the operating section under the indirect method? Help me make sense of this.

B

Misc. Additional Proofs

B.1 Proof that Present Value Equals Face Value When Coupon Rate Equals Market Rate

Note: Credit to Jack Zhou, my Fall 2019 student and current research assistant, for this.

The following proof is for those of you who are not satisfied by simply pasting the calculations into Google.

We would like to prove the following identity when coupon rate equals market interest rate.

$$Present\ Value = Face\ Value$$

Suppose a 5-year bond with coupon rate at 6% and face value at $10,000, and the market rate is also 6%, the following equation can be set up with the left side representing the equation for present value and the right side representing the face value:

$$\frac{600}{1.06} + \frac{600}{(1.06)^2} + \frac{600}{(1.06)^3} + \frac{600}{(1.06)^4} + \frac{10600}{(1.06)^5} = 10000$$

To generalize this, if we label face value as $\boldsymbol{x}$ and interest rate as $\boldsymbol{i}$, then the equation can be transformed as follow:

$$\frac{xi}{(1+i)}+\frac{xi}{(1+i)^2}+\frac{xi}{(1+i)^3}+\frac{xi}{(1+i)^4}+\frac{x(1+i)}{(1+i)^5}=x$$

which can be generalized to the following for a bond with $\boldsymbol{n}$ years to maturity:

$$\frac{xi}{(1+i)}+\frac{xi}{(1+i)^2}+\ldots+\frac{xi}{(1+i)^{n-2}}+\frac{xi}{(1+i)^{n-1}}+\frac{x(1+i)}{(1+i)^n}=x$$

This can then be rewritten as:

$$xi(1+i)^{n-1}+xi(1+i)^{n-2}+\ldots+xi(1+i)^2+xi(1+i)+x(1+i)=x(1+i)^n$$

The $\boldsymbol{x}$ on the left hand side can be factored out:

$$x(i(1+i)^{n-1}+i(1+i)^{n-2}+\ldots+i(1+i)^2+i(1+i)+(1+i))=x(1+i)^n$$

Which can be further simplified by combining the two $(1+i)$:

$$\begin{aligned}x(i(1+i)^{n-1}+i(1+i)^{n-2}+\ldots+i(1+i)^2+(i+1)(1+i))&=x(1+i)^n\\ x(i(1+i)^{n-1}+i(1+i)^{n-2}+\ldots+i(1+i)^2+(1+i)^2)&=x(1+i)^n\end{aligned}$$

Continuing this operation...

$$\begin{aligned}x(i(1+i)^{n-1}+i(1+i)^{n-2}+\ldots+(i+1)(1+i)^2)&=x(1+i)^n\\ x(i(1+i)^{n-1}+i(1+i)^{n-2}+\ldots+i(1+i)^3+(1+i)^3)&=x(1+i)^n\\ &\ldots\\ x((i+1)(1+i)^{n-1})&=x(1+i)^n\\ x(1+i)^n&=x(1+i)^n\end{aligned}$$

Simplifying, we get the identity that we started with:

$$x = x$$

$$Present\ Value = Face\ Value$$

Therefore, algebraically, when the market's interest rate equals the coupon rate, the present value of the bond equals its face value.

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