Contributor name: Prabhakar Sudhakar Gund

Book Proposed: Corporate Finance

Total Chapters: 31

Total Examples: 145

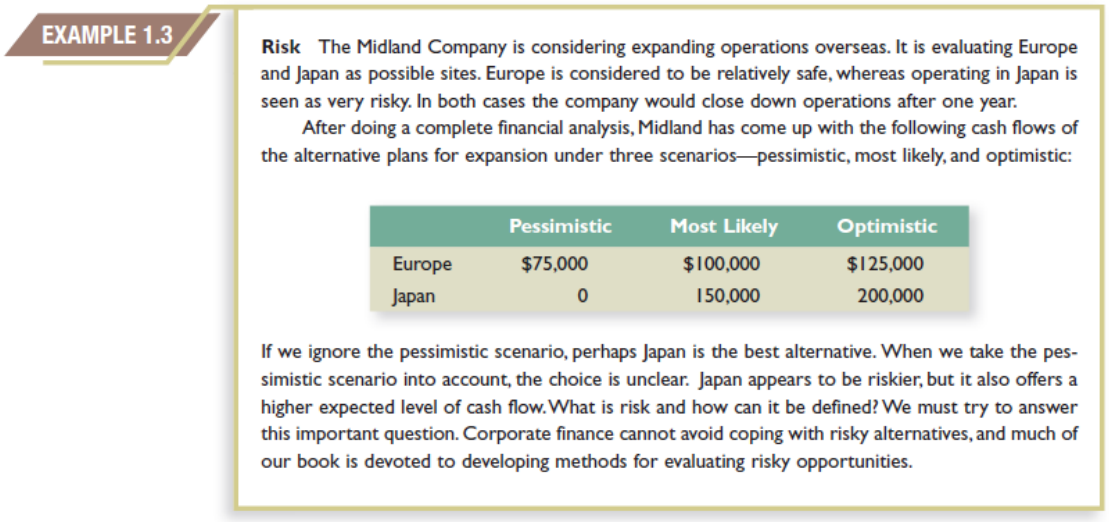
Codable Examples: 114

Chapter 1: Introduction to Corporate Finance

Example 1.1 – Codable

Example 1.2 – Codable

Example 1.3 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)



EXAMPLE 1.3

Risk The Midland Company is considering expanding operations overseas. It is evaluating Europe and Japan as possible sites. Europe is considered to be relatively safe, whereas operating in Japan is seen as very risky. In both cases the company would close down operations after one year.

After doing a complete financial analysis, Midland has come up with the following cash flows of the alternative plans for expansion under three scenarios—pessimistic, most likely, and optimistic:

	Pessimistic	Most Likely	Optimistic
Europe	$75,000	$100,000	$125,000
Japan	0	150,000	200,000

If we ignore the pessimistic scenario, perhaps Japan is the best alternative. When we take the pessimistic scenario into account, the choice is unclear. Japan appears to be riskier, but it also offers a higher expected level of cash flow. What is risk and how can it be defined? We must try to answer this important question. Corporate finance cannot avoid coping with risky alternatives, and much of our book is devoted to developing methods for evaluating risky opportunities.

Chapter 2: Financial Statements and Cash Flow

Example 2.1 – Codable

Example 2.2 – Codable

Chapter 3: Financial Statements Analysis and Financial Models

Example 3.1 – Codable

Example 3.2 – Codable

Example 3.3 – Codable

Example 3.4 – Codable

Example 3.5 – Codable

Example 3.6 – Codable

Chapter 4: Discounted Cash Flow Valuation

Example 4.1 – Codable

Example 4.2 – Codable

Example 4.3 – Codable

Example 4.4 – Codable

Example 4.5 – Codable

Example 4.6 – Codable

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Example 4.11 – Codable

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Example 4.23 – Codable

Example 4.24 – Codable

Example 4.25 – Codable

Example 4.26 – Codable

Example 4.27 – Codable

Example 4.28 – Codable

Example 4.29 – Codable

Chapter 5: Net Present Value and Other Investment Rules

Example 5.1 – Codable

Example 5.2 – Codable

Example 5.3 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 5.3

Mutually Exclusive Investments Suppose that the Kaufold Corporation has two alternative uses for a warehouse. It can store toxic waste containers (Investment *A*) or electronic equipment (Investment *B*). The cash flows are as follows:

	Cash Flow at Year				NPV			
Year:	0	1	2	3	@ 0%	@10%	@15%	IRR
Investment *A*	−$10,000	$10,000	$1,000	$ 1,000	$2,000	$669	$109	16.04%
Investment *B*	−10,000	1,000	1,000	12,000	4,000	751	−484	12.94

We find that the NPV of Investment *B* is higher with low discount rates, and the NPV of Investment *A* is higher with high discount rates. This is not surprising if you look closely at the cash flow patterns. The cash flows of *A* occur early, whereas the cash flows of *B* occur later. If we assume a high discount rate, we favor Investment *A* because we are implicitly assuming that the early cash flow (for example, $10,000 in Year 1) can be reinvested at that rate. Because most of Investment *B*'s cash flows occur in Year 3, *B*'s value is relatively high with low discount rates.

Example 5.4 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 5.4

Profitability Index Hiram Finnegan Inc. (HFI) applies a 12 percent discount rate to two investment opportunities.

	Cash Flows ($000,000)			PV @ 12% of Cash Flows Subsequent to Initial Investment	Profitability	NPV @12%
Project	C_0	C_1	C_2	($000,000)	Index	($000,000)
1	−$20	$70	$10	$70.5	3.53	$50.5
2	−10	15	40	45.3	4.53	35.3

Chapter 6: Making Capital Investment Decisions

Example 6.1 – Codable

Example 6.2 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

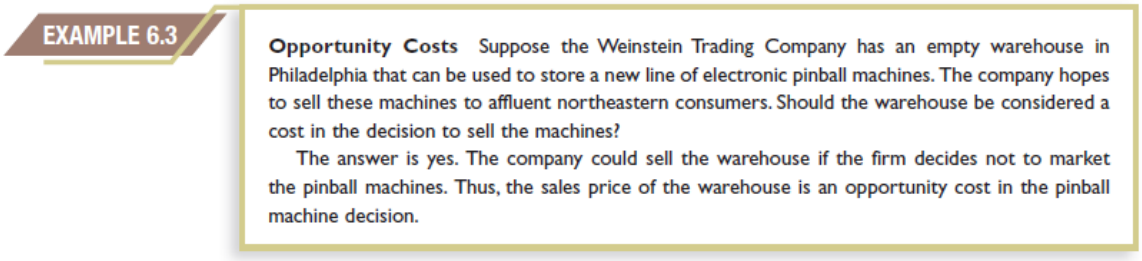
EXAMPLE 6.2

Sunk Costs The General Milk Company (GMC) is currently evaluating the NPV of establishing a line of chocolate milk. As part of the evaluation, the company paid a consulting firm $100,000 last year for a test marketing analysis. Is this cost relevant for the capital budgeting decision now confronting GMC's management?

The answer is no. The $100,000 is not recoverable, so the $100,000 expenditure is a sunk cost, or spilled milk. In other words, one must ask, "What is the difference between the cash flows of the entire firm with the chocolate milk project and the cash flows of the entire firm without the project?" Since the $100,000 was already spent, acceptance of the project does not affect this cash flow. Therefore, the cash flow should be ignored for capital budgeting purposes.

Of course, the decision to spend $100,000 for a marketing analysis was a capital budgeting decision itself and was perfectly relevant *before* it was sunk. Our point is that once the company incurred the expense, the cost became irrelevant for any future decision.

Example 6.3 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)



EXAMPLE 6.3

Opportunity Costs Suppose the Weinstein Trading Company has an empty warehouse in Philadelphia that can be used to store a new line of electronic pinball machines. The company hopes to sell these machines to affluent northeastern consumers. Should the warehouse be considered a cost in the decision to sell the machines?

The answer is yes. The company could sell the warehouse if the firm decides not to market the pinball machines. Thus, the sales price of the warehouse is an opportunity cost in the pinball machine decision.

Example 6.4 – Codable

Example 6.5 – Codable

Example 6.6 – Codable

Example 6.7 – Codable

Example 6.8 – Codable

Example 6.9 – Codable

Example 6.10 – Codable

Example 6.11 – Codable

Chapter 7: Risk Analysis, Real Options, and Capital Budgeting

Chapter 8: Interest Rates and Bond Valuation

Example 8.1 – Codable

Example 8.2 – Codable

Example 8.3 – Codable

Example 8.4 – Codable

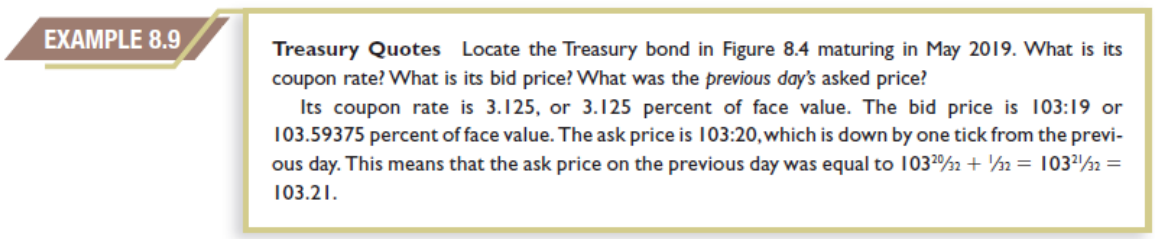
Example 8.5 – Codable

Example 8.6 – Codable

Example 8.7 – Codable

Example 8.8 – Codable

Example 8.9 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)



EXAMPLE 8.9

Treasury Quotes Locate the Treasury bond in Figure 8.4 maturing in May 2019. What is its coupon rate? What is its bid price? What was the *previous day's* asked price?

Its coupon rate is 3.125, or 3.125 percent of face value. The bid price is 103:19 or 103.59375 percent of face value. The ask price is 103:20, which is down by one tick from the previous day. This means that the ask price on the previous day was equal to $103^{20}/_{32} + {}^{1}/_{32} = 103^{21}/_{32} = 103.21$.

Example 8.10 – Codable

Chapter 9: Stock Valuation

Example 9.1 – Codable

Example 9.2 – Codable

Example 9.3 – Codable

Example 9.4 – Codable

Example 9.5 – Codable

Example 9.6 – Codable

Example 9.7 – Codable

Example 9.8 – Codable

Chapter 10: Risk and Return: Lessons from Market History

Example 10.1 – Codable

Example 10.2 – Codable

Example 10.3 – Codable

Example 10.4 – Codable

Example 10.5 – Codable

Example 10.6 – Codable

Chapter 11: Return and Risk: The Capital Asset Pricing Model (CAPM)

Example 11.1 – Codable

Example 11.2 – Codable

Example 11.3 – Codable

Example 11.4 – Codable

Example 11.5 – Codable

Chapter 12: An Alternative View of Risk and Return: The Arbitrage Pricing Theory

Example 12.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 12.1

Diversification and Unsystematic Risk The preceding material can be further explained by the following example. We keep our one-factor model here but make three specific assumptions:

1. All securities have the same expected return of 10 percent. This assumption implies that the first row of Equation 12.4 must also equal 10 percent because this row is a weighted average of the expected returns of the individual securities.
2. All securities have a beta of 1. The sum of the terms inside the parentheses in the second row of Equation 12.4 must equal 1 because these terms are a weighted average of the individual betas. Because the terms inside the parentheses are multiplied by F, the value of the second row is $1 \times F = F$.
3. In this example, we focus on the behavior of one individual, Walter V. Bagehot. Mr. Bagehot decides to hold an equally weighted portfolio. That is, the proportion of each security in his portfolio is $1/N$.

We can express the return on Mr. Bagehot's portfolio as follows:

Return on Walter V. Bagehot's Portfolio

$$R_p = \underbrace{10\%}_{\text{From Row 1 of Equation 12.4}} + \underbrace{F}_{\text{From Row 2 of Equation 12.4}} + \underbrace{\left(\frac{1}{N}\epsilon_1 + \frac{1}{N}\epsilon_2 + \frac{1}{N}\epsilon_3 + \cdots + \frac{1}{N}\epsilon_N\right)}_{\text{From Row 3 of Equation 12.4}} \quad (12.4')$$

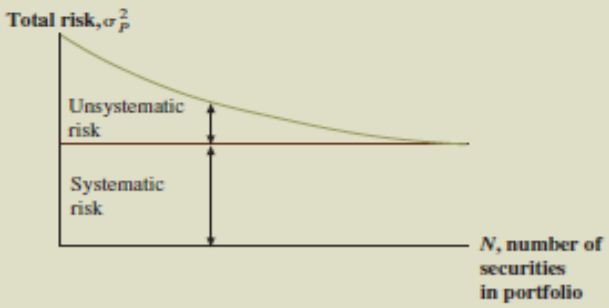
We mentioned before that as N increases without limit, Row 3 of Equation 12.4 becomes equal to zero.[4] Thus, the return on Walter Bagehot's portfolio when the number of securities is very large is:

$$R_p = 10\% + F \quad (12.4'')$$

The key to diversification is exhibited in Equation 12.4". The unsystematic risk of Row 3 vanishes while the systematic risk of Row 2 remains.

This is illustrated in Figure 12.2. Systematic risk, captured by variation in the factor, F, is not reduced through diversification. Conversely, unsystematic risk diminishes as securities are added, vanishing as the number of securities becomes infinite. Our result is analogous to the diversification example of the previous chapter. In that chapter, we said that undiversifiable or systematic risk arises from positive covariances between securities. In this chapter, we say that systematic risk arises from a common factor, F. Because a common factor causes positive covariances, the arguments of the two chapters are parallel.

Figure 12.2 **Diversification and the Portfolio Risk for an Equally Weighted Portfolio**



Total risk decreases as the number of securities in the portfolio rises. This drop occurs only in the unsystematic risk component. Systematic risk is unaffected by diversification.

Chapter 13: Risk, Cost of Capital, and Valuation

Example 13.1 – Codable

Example 13.2 – Codable

Example 13.3 – Codable

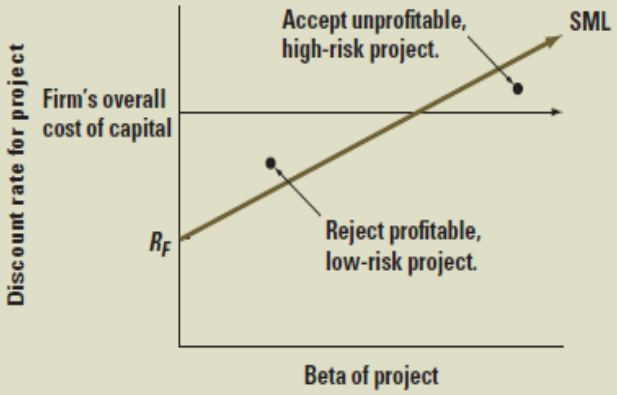
Example 13.4 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 13.4

Project Risk D. D. Ronnelley Co., a publishing firm, may accept a project in computer software. Noting that computer software companies have high betas, the publishing firm views the software venture as more risky than the rest of its business. It should discount the project at a rate commensurate with the risk of software companies. For example, it might use the average beta of a portfolio of publicly traded software firms. Instead, if all projects in D. D. Ronnelley Co. were discounted at the same rate, a bias would result. The firm would accept too many high-risk projects (software ventures) and reject too many low-risk projects (books and magazines). This point is illustrated in Figure 13.5.

(continued)

Figure 13.5 Relationship between the Firm's Cost of Capital and the Security Market Line (SML)



A single cost of capital for all projects in a firm, as indicated by the horizontal line in the figure, may lead to incorrect capital budgeting decisions. Projects with high risk, such as the software venture for D. D. Ronnelley Co., should be discounted at a high rate. By using the firm's cost of capital, the firm is likely to accept too many high-risk projects.

Projects with low risk should be discounted at a low rate. By using the firm's cost of capital, the firm is likely to reject too many low-risk projects.

Example 13.5 – Codable

Example 13.6 – Codable

Chapter 14: Efficient Capital Markets and Behavioral Challenges

Example 14.1 – Codable

Example 14.2 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 14.2

Can Stock Market Investors Add and Subtract? On March 2, 2000, 3Com, a profitable provider of computer networking products and services, sold 5 percent of one of its subsidiaries, Palm, to the public via an initial public offering (IPO). 3Com planned to distribute the remaining Palm shares to 3Com shareholders at a later date. Under the plan, if you owned one share of 3Com, you would receive 1.5 shares of Palm. So after 3Com sold part of Palm via the IPO, investors could buy Palm shares directly or indirectly by purchasing shares of 3Com and waiting.

(continued)

[12]Kenneth A. Froot and Emil M. Dabora, "How Are Stock Prices Affected by the Location of Trade?" *Journal of Financial Economics* 53 (August 1999).

[13]Owen Lamont and Richard Thaler, "Can the Market Add and Subtract? Mispricing in Tech Stock Carve-Outs," *Journal of Political Economy* (April 2003).

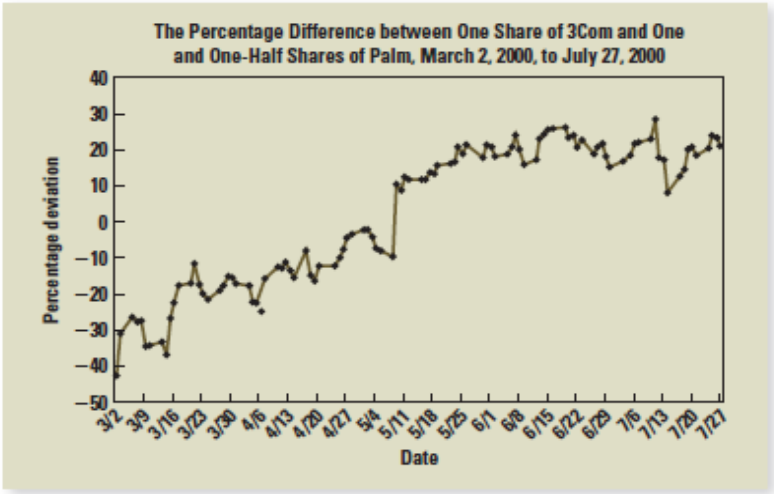
What makes this case interesting is what happened in the days that followed the Palm IPO. If you owned one 3Com share, you would be entitled, eventually, to 1.5 shares of Palm. Therefore, each 3Com share should be worth *at least* 1.5 times the value of each Palm share. We say *at least* because the other parts of 3Com were profitable. As a result, each 3Com share should have been worth much more than 1.5 times the value of one Palm share. But as you might guess, things did not work out this way.

The day before the Palm IPO, shares in 3Com sold for $104.13. After the first day of trading, Palm closed at $95.06 per share. Multiplying $95.06 by 1.5 results in $142.59, which is the minimum value we would expect to pay for 3Com. But the day Palm closed at $95.06, 3Com shares closed at $81.81, more than $60 lower than the price implied by Palm.

A 3Com price of $81.81 when Palm was selling for $95.06 implies that the market valued the rest of 3Com's businesses (per share) at $81.81 − 142.59 = −$60.78. Given the number of 3Com shares outstanding at the time, this means the market placed a *negative* value of about $22 billion on the rest of 3Com's businesses. Of course, a stock price cannot be negative. This means that the price of Palm relative to 3Com was much too high.

To profit from this mispricing, investors would purchase shares of 3Com and sell shares of Palm. This trade was a no-brainer. In a well-functioning market arbitrage traders would force the prices into alignment quickly. What happened?

As you can see in the accompanying figure, the market valued 3Com and Palm shares in such a way that the non-Palm part of 3Com had a negative value for about two months from March 2, 2000, until May 8, 2000. Thus, the pricing error was corrected by market forces, but not instantly, which is consistent with the existence of limits to arbitrage.



Chapter 15: Long-Term Financing: An Introduction

Example 15.1 – Codable

Chapter 16: Capital Structure: Basic Concepts

Example 16.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 16.1

Debt and Firm Value Suppose the market value of the J. J. Sprint Company is $1,000. The company currently has no debt, and each of J. J. Sprint's 100 shares of stock sells for $10. A company such as J. J. Sprint with no debt is called an *unlevered* company. Further suppose that J. J. Sprint plans to borrow $500 and pay the $500 proceeds to shareholders as an extra cash dividend of $5 per share. After the issuance of debt, the firm becomes *levered*. The investments of the firm will not change as a result of this transaction. What will the value of the firm be after the proposed restructuring?

Management recognizes that, by definition, only one of three outcomes can occur from restructuring. Firm value after restructuring can be (I) greater than the original firm value of $1,000, (2) equal to $1,000, or (3) less than $1,000. After consulting with investment bankers, management believes that restructuring will not change firm value more than $250 in either direction. Thus it views firm values of $1,250, $1,000, and $750 as the relevant range. The original capital structure and these three possibilities under the new capital structure are presented next:

	No Debt (Original Capital Structure)	Value of Debt plus Equity after Payment of Dividend (Three Possibilities)		
		I	II	III
Debt	$ 0	$ 500	$ 500	$500
Equity	1,000	750	500	250
Firm value	$1,000	$1,250	$1,000	$750

Note that the value of equity is below $1,000 under any of the three possibilities. This can be explained in one of two ways. First, the table shows the value of the equity *after* the extra cash dividend is paid. Because cash is paid out, a dividend represents a partial liquidation of

(*continued*)

the firm. Consequently there is less value in the firm for the equityholders after the dividend payment. Second, in the event of a future liquidation, stockholders will be paid only after bondholders have been paid in full. Thus the debt is an encumbrance of the firm, reducing the value of the equity.

Of course management recognizes that there are infinite possible outcomes. These three are to be viewed as *representative* outcomes only. We can now determine the payoff to stockholders under the three possibilities:

	Payoff to Shareholders after Restructuring		
	I	II	III
Capital gains	−$250	−$500	−$750
Dividends	500	500	500
Net gain or loss to stockholders	$250	$ 0	−$250

No one can be sure ahead of time which of the three outcomes will occur. However, imagine that managers believe that Outcome I is most likely. They should definitely restructure the firm because the stockholders would gain $250. That is, although the price of the stock declines by $250 to $750, they receive $500 in dividends. Their net gain is $250 = −$250 + $500. Also, notice that the value of the firm would rise by $250 = $1,250 − $1,000.

Alternatively, imagine that managers believe that Outcome III is most likely. In this case they should not restructure the firm because the stockholders would expect a $250 loss. That is, the stock falls by $750 to $250 and they receive $500 in dividends. Their net loss is −$250 = −$750 + $500. Also, notice that the value of the firm would change by −$250 = $750 − $1,000.

Finally, imagine that the managers believe that Outcome II is most likely. Restructuring would not affect the stockholders' interest because the net gain to stockholders in this case is zero. Also notice that the value of the firm is unchanged if Outcome II occurs.

Example 16.2 – Codable

Example 16.3 – Codable

Example 16.4 – Codable

Chapter 17: Capital Structure: Limits to the Use of Debt

Example 17.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 17.1

Bankruptcy Costs The Knight Corporation plans to be in business for one more year. It forecasts a cash flow of either $100 or $50 in the coming year, each occurring with 50 percent probability. The firm has no other assets. Previously issued debt requires payments of $49 of interest and principal. The Day Corporation has identical cash flow prospects but has $60 of interest and principal obligations. The cash flows of these two firms can be represented as follows:

	Knight Corporation		Day Corporation	
	Boom Times (prob. 50%)	Recession (prob. 50%)	Boom Times (prob. 50%)	Recession (prob. 50%)
Cash flow	$100	$50	$100	$50
Payment of interest and principal on debt	49	49	60	50
Distribution to stockholders	$ 51	$ 1	$ 40	$ 0

For Knight Corporation in both boom times and recession and for Day Corporation in boom times, cash flow exceeds interest and principal payments. In these situations the bondholders are paid in full, and the stockholders receive any residual. However, the most interesting of the four columns involves Day Corporation in a recession. Here the bondholders are owed $60, but the firm has only $50 in cash. Because we assume that the firm has no other assets, the bondholders cannot be satisfied in full. Bankruptcy occurs, implying that the bondholders will receive all of the firm's cash, and the stockholders will receive nothing. Importantly, the stockholders do not have to come up with the additional $10 (=$60 − $50). Corporations have limited liability in America and most other countries, implying that bondholders cannot sue the stockholders for the extra $10.[1]

Let's compare the two companies in recession. The bondholders of Knight receive $49 and the stockholders receive $1, for a total of $50. The bondholders of Day receive $50 and the stockholders receive $0, also for a total of $50. There is an important point here. While Day goes bankrupt but Knight does not, the investors of both firms receive $50. In other words, bankruptcy does not reduce the firm's cash flows. One often hears that bankruptcy causes a reduction in value or cash flow. But that is not the case. In our example, it is a recession causing the reduction, not bankruptcy.

(continued)

However, we have left something out. Day's example is not realistic because it ignores an important cash flow. A more realistic set of numbers might be:

	Day Corporation	
	Boom Times (prob. 50%)	Recession (prob. 50%)
Earnings	$100	$50
Debt repayment	60	35
Distribution to stockholders	$ 40	$ 0

Why do the bondholders receive only $35 in a recession? If cash flow is only $50, bondholders will be informed that they will not be paid in full. These bondholders are likely to hire lawyers to negotiate or even to sue the company. Similarly, the firm is likely to hire lawyers to defend itself. Further costs will be incurred if the case gets to a bankruptcy court. These fees are always paid before the bondholders get paid. In this example, we are assuming that bankruptcy costs total $15 (=$50 − $35).

Let's compare the example with bankruptcy costs to the example without these costs. Because of its greater leverage, Day Corporation faces the possibility of bankruptcy, while Knight Corporation does not. Nevertheless, as we saw earlier, total cash flow to investors is the same for both firms in a world without bankruptcy costs. However, once we introduce bankruptcy costs, total cash flow to investors becomes lower for the bankrupt company, Day. In a recession, Knight's bondholders receive $49 and the stockholders receive $1, for a total of $50. In a recession, Day's bondholders receive $35 and the stockholders receive $0, for a total of only $35. Thus, we can conclude the following:

Leverage increases the likelihood of bankruptcy. However, bankruptcy does not, by itself, lower the cash flows to investors. Rather, it is the costs associated with bankruptcy that lower cash flows.

Our pie example can provide an explanation. In a world without bankruptcy costs, the bondholders and the stockholders share the entire pie. However, bankruptcy costs eat up some of the pie in the real world, leaving less for the stockholders and bondholders.

Example 17.2 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 17.2

Agency Costs Ms. Pagell is an owner–entrepreneur running a computer services firm worth $1 million. She currently owns 100 percent of the firm. Because of the need to expand, she must raise another $2 million. She can either issue $2 million of debt at 12 percent interest or issue $2 million in stock. The cash flows under the two alternatives are presented here:

	Debt Issue				Stock Issue			
Work Intensity	Cash Flow	Interest	Cash Flow to Equity	Cash Flow to Ms. Pagell (100% of equity)	Cash Flow	Interest	Cash Flow to Equity	Cash Flow to Ms. Pagell ($33\frac{1}{3}$% of equity)
6-hour days	$300,000	$240,000	$ 60,000	$ 60,000	$300,000	0	$300,000	$100,000
10-hour days	400,000	240,000	160,000	160,000	400,000	0	400,000	133,333

Like any entrepreneur, Ms. Pagell can choose the degree of intensity with which she works. In our example, she can work either a 6- or a 10-hour day. With the debt issue, the extra work brings her $100,000 (=$160,000 − $60,000) more income. However, let's assume that with a stock issue she retains only a one-third interest in the equity. Here, the extra work brings her merely $33,333 (=$133,333 − $100,000). Being human, she is likely to work harder if she issues debt. In other words, she has more incentive to *shirk* if she issues equity.

In addition, she is likely to obtain more *perquisites* (a big office, a company car, more expense account meals) if she issues stock. If she is a one-third stockholder, two-thirds of these costs are paid for by the other stockholders. If she is the sole owner, any additional perquisites reduce her equity stake alone.

Finally, she is more likely to take on capital budgeting projects with negative net present values. It might seem surprising that a manager with any equity interest at all would take on negative NPV projects, since the stock price would clearly fall here. However, managerial salaries generally rise with firm size, providing managers with an incentive to accept some unprofitable projects after all the profitable ones have been taken on. That is, when an unprofitable project is accepted, the loss in stock value to a manager with only a small equity interest may be less than the increase in salary. In fact, it is our opinion that losses from accepting bad projects are far greater than losses from either shirking or excessive perquisites. Hugely unprofitable projects have bankrupted whole firms, something that even the largest expense account is unlikely to do.

Thus, as the firm issues more equity, our entrepreneur will likely increase leisure time, work-related perquisites, and unprofitable investments. These three items are called *agency costs* because managers of the firm are agents of the stockholders.[14]

Chapter 18: Valuation and Capital Budgeting for the Levered Firm

Example 18.1 – Codable

Example 18.2 – Codable

Example 18.3 – Codable

Example 18.4 – Codable

Chapter 19: Dividends and Other Payouts

Example 19.1 – Codable

Example 19.2 – Codable

Chapter 20: Raising Capital

Chapter 21: Leasing

Chapter 22: Options and Corporate Finance

Example 22.1 – Codable

Example 22.2 – Codable

Example 22.3 – Codable

Example 22.4 – Codable

Example 22.5 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 22.5

Stocks and Bonds as Options The Popov Company has been awarded the concessions at next year's Olympic Games in Antarctica. Because the firm's principals live in Antarctica and because there is no other concession business on that continent, their enterprise will disband after the games. The firm has issued debt to help finance this venture. Interest and principal due on the debt next year will be $800, at which time the debt will be paid off in full. The firm's cash flows next year are forecast as follows:

	Popov's Cash Flow Schedule			
	Very Successful Games	Moderately Successful Games	Moderately Unsuccessful Games	Outright Failure
Cash flow before interest and principal	$1,000	$ 850	$ 700	$ 550
−interest and principal	−800	−800	−700	−550
Cash flow to stockholders	$ 200	$ 50	$ 0	$ 0

As can be seen, the principals forecast four equally likely scenarios. If either of the first two scenarios occurs, the bondholders will be paid in full. The extra cash flow goes to the stockholders. However, if either of the last two scenarios occurs, the bondholders will not be paid in full. Instead, they will receive the firm's entire cash flow, leaving the stockholders with nothing.

Example 22.6 – Codable

Chapter 23: Options and Corporate Finance: Extension and Applications
Example 23.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 23.1

Options at Starbucks Stock options are not always restricted to the highest-ranking executives. Starbucks, the coffee chain, has pushed options down to the lowest-level employees. To quote its founder, Howard Schultz, "Even though we were a private company, we would grant stock options to every employee companywide, from the top managers to the baristas, in proportion to their level of base pay. They could then, through their efforts, help make Starbucks more successful every year, and if Starbucks someday went public, their options could eventually be worth a good sum of money."

Example 23.2 – Codable

Chapter 24: Warrants and Convertibles

Example 24.1 – Codable

Example 24.2 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 24.2

Convertibles On June 8, 2010, Microsoft raised $1.15 billion by issuing zero coupon convertible subordinated debentures due in 2013. Each bond was convertible into 29.9434 shares of common stock of Microsoft any time before maturity. The number of shares received for each bond (29.9434 in this example) is called the **conversion ratio.**

Bond traders also speak of the **conversion price** of the bond. This price is calculated as the ratio of the face value of the bond to the conversion ratio. Because the face value of each Microsoft bond was $1,000, the conversion price was $33.40 (= $1,000 / 29.9434). If a bondholder chose to convert, she would give up a bond with a face value of $1,000 and receive 29.9434 shares of Microsoft common stock in return. Thus, the conversion is equivalent to paying $33.40 for each share of Microsoft common stock received.

When Microsoft issued its convertible bonds, its common stock was trading at $25.11 per share. The conversion price of $33.40 was 33 percent higher than the actual common stock price. This 33 percent is referred to as the **conversion premium.** It reflects the fact that the conversion option in Microsoft convertible bonds was *out of the money*, meaning that immediate conversion would be unprofitable. This conversion premium is typical.

Convertibles are almost always protected against stock splits and stock dividends. Thus, if Microsoft's common stock were split two-for-one, the conversion ratio would increase from 29.9434 to 59.8868.

Example 24.3 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 24.3

Conversion Suppose the Moulton Company has outstanding 1,000 shares of common stock and 100 bonds. Each bond has a face value of $1,000 at maturity. They are discount bonds and pay no coupons. At maturity each bond can be converted into 10 shares of newly issued common stock.

What circumstances will make it advantageous for the holders of Moulton convertible bonds to convert to common stock at maturity?

If the holders of the convertible bonds convert, they will receive $100 \times 10 = 1{,}000$ shares of common stock. Because there were already 1,000 shares, the total number of shares outstanding becomes 2,000 upon conversion. Thus, converting bondholders own 50 percent of the value of the firm, V. If they do not convert, they will receive $100,000 or V, whichever is less. The choice for the holders of the Moulton bonds is obvious. They should convert if 50 percent of V is greater than $100,000. This will be true whenever V is greater than $200,000. This is illustrated as follows:

Payoff to Convertible Bondholders and Stockholders of the Moulton Company

	(1) $V \leq 100{,}000$	(2) $100{,}000 < V \leq 200{,}000$	(3) $V > 200{,}000$
Decision:	Bondholders will not convert	Bondholders will not convert	Bondholders will convert
Convertible bondholders	V	$100,000	.5V
Stockholders	0	$V - 100{,}000$	.5V

Example 24.4 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 24.4

Are Convertibles Always Better? The stock price of RW Company is $20. Suppose this company can issue subordinated debentures at 10 percent. It can also issue convertible bonds at 6 percent with a conversion value of $800. The conversion value means that the holders can convert a convertible bond into 40 (=$800/$20) shares of common stock.

A company treasurer who believes in free lunches might argue that convertible bonds should be issued because they represent a cheaper source of financing than both subordinated bonds and common stock. The treasurer will point out that if the company does poorly and the price does not rise above $20, the convertible bondholders will not convert the bonds into common stock. In this case the company will have obtained debt financing at below-market rates by attaching worthless equity kickers. On the other hand, if the firm does well and the price of its common stock rises to $25 or above, convertible holders will convert. The company will issue 40 shares. The company will receive a bond with a face value of $1,000 in exchange for issuing 40 shares of common stock, implying a conversion price of $25. The company will have issued common stock at $25 per share, or 20 percent above the $20 common stock price prevailing when the convertible bonds were issued. This enables it to lower its cost of equity capital. Thus, the treasurer happily points out, regardless of whether the company does well or poorly, convertible bonds are the cheapest form of financing.

Although this argument may sound quite plausible at first, there is a flaw. The treasurer is comparing convertible financing *with straight debt* when the stock subsequently falls. However, the treasurer compares convertible financing *with common stock* when the stock subsequently rises. This is an unfair mixing of comparisons. By contrast, our analysis in Table 24.2 was fair because we examined both stock increases and decreases when comparing a convertible with each alternative instrument. We found that no single alternative dominated convertible bonds in *both* up and down markets.

Chapter 25: Derivatives and Hedging Risk

Example 25.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 25.1

Futures Hedging In June, Bernard Abelman, a Midwestern farmer, anticipates a harvest of 50,000 bushels of wheat at the end of September. He has two alternatives.

1. *Write futures contracts against his anticipated harvest.* The September wheat contract on the Chicago Board of Trade is trading at $3.75 a bushel on June 1. He executes the following transaction:

Date of Transaction	Transaction	Price per Bushel
June 1	Write 10 September futures contracts	$3.75

He notes that transportation costs to the designated delivery point in Chicago are 30 cents/bushel. Thus, his net price per bushel is $3.45 = $3.75 − $.30.

2. *Harvest the wheat without writing a futures contract.* Alternatively, Mr. Abelman could harvest the wheat without the benefit of a futures contract. The risk would be quite great here because no one knows what the cash price in September will be. If prices rise, he will profit. Conversely, he will lose if prices fall.

We say that Strategy 2 is an unhedged position because there is no attempt to use the futures markets to reduce risk. Conversely, Strategy 1 involves a hedge. That is, a position in the futures market offsets the risk of a position in the physical—that is, in the actual—commodity.

Though hedging may seem quite sensible to you, it should be mentioned that not everyone hedges. Mr. Abelman might reject hedging for at least two reasons.

First, he may simply be uninformed about hedging. We have found that not everyone in business understands the hedging concept. Many executives have told us that they do not want to use futures markets for hedging their inventories because the risks are too great. However, we disagree. While there are large price fluctuations in these markets, hedging actually reduces the risk that an individual holding inventories bears.

Second, Mr. Abelman may have a special insight or some special information that commodity prices will rise. He would not be wise to lock in a price of $3.75 if he expects the cash price in September to be well above this price.

The hedge of Strategy 1 is called a **short hedge** because Mr. Abelman reduces his risk by *selling* a futures contract. The short hedge is very common in business. It occurs whenever someone either anticipates receiving inventory or is holding inventory. Mr. Abelman is anticipating the harvest of grain. A manufacturer of soybean meal and oil may hold large quantities of raw soybeans that are already paid for. However, the prices to be received for meal and oil are not known because no one knows what the market prices will be when the meal and oil are produced. The manufacturer may write futures contracts in meal and oil to lock in sales prices. An oil company may hold large inventories of petroleum to be processed into heating oil. The firm could sell futures contracts in heating oil to lock in the sales price. A mortgage banker may assemble mortgages slowly before selling them in bulk to a financial institution. Movements of interest rates affect the value of the mortgages while they are in inventory. The mortgage banker could sell Treasury bond futures contracts to offset this interest rate risk. (This last example is treated later in this chapter.)

Example 25.2 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 25.2

More Hedging On April 1, Moon Chemical agreed to sell petrochemicals to the U.S. government in the future. The delivery dates and prices have been determined. Because oil is a basic ingredient in the production process, Moon Chemical will need to have large quantities of oil on hand. The firm can get the oil in one of two ways:

1. *Buy the oil as the firm needs it.* This is an unhedged position because, as of April 1, the firm does not know the prices it will later have to pay for the oil. Oil is quite a volatile commodity, so Moon Chemical is bearing a good bit of risk. The key to this risk bearing is that the sales price to the U.S. government has already been fixed. Thus, Moon Chemical cannot pass on increased costs to the consumer.
2. *Buy futures contracts.*[5] The firm can buy futures contracts with expiration months corresponding to the dates the firm needs inventory. The futures contracts lock in the purchase price to Moon

(*continued*)

[5]Alternatively, the firm could buy the oil on April 1 and store it. This would eliminate the risk of price movement because the firm's oil costs would be fixed upon the immediate purchase. However, this strategy would be inferior to Strategy 2 in the common case where the difference between the futures contract quoted on April 1 and the April 1 cash price is less than the storage costs.

Chemical. Because there is a crude oil futures contract for every month, selecting the correct futures contract is not difficult. Many other commodities have only five contracts per year, frequently necessitating buying contracts one month away from the month of production.

As mentioned earlier, Moon Chemical is interested in hedging the risk of fluctuating oil prices because it cannot pass any cost increases on to the consumer. Suppose, alternatively, that Moon Chemical was not selling petrochemicals on a fixed contract to the U.S. government. Instead, imagine that the petrochemicals were to be sold to private industry at currently prevailing prices. The price of petrochemicals should move directly with oil prices because oil is a major component of petrochemicals. Because cost increases are likely to be passed on to the consumer, Moon Chemical would probably not want to hedge in this case. Instead, the firm is likely to choose Strategy 1, buying the oil as it is needed. If oil prices increase between April 1 and, say, September 1, Moon Chemical will, of course, find that its inputs have become quite costly. However, in a competitive market, its revenues are likely to rise as well.

Strategy 2 is called a **long hedge** because one *purchases* a futures contract to reduce risk. In other words, one takes a long position in the futures market. In general, a firm institutes a long hedge when it is committed to a fixed sales price. One class of situations involves actual written contracts with customers, such as the one Moon Chemical had with the U.S. government. Alternatively, a firm may find that it cannot easily pass on costs to consumers or does not want to pass on these costs. For example, a group of students opened a small meat market called *What's Your Beef* near the University of Pennsylvania in the late 1970s.[6] This was a time of volatile consumer prices, especially food prices. Knowing that their fellow students were particularly budget-conscious, the owners vowed to keep food prices constant regardless of price movements in either direction. They accomplished this by purchasing futures contracts in various agricultural commodities.

Example 25.3 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 25.3

Interest Rate Hedging Ron Cooke owns a mortgage banking company. On March 1, he made a commitment to lend a total of $1 million to various homeowners on May 1. The loans are 20-year mortgages carrying a 12 percent coupon, the going interest rate on mortgages at the time. Thus, the mortgages are made at par. Though homeowners would not use the term, we could say that he is buying a *forward contract* on a mortgage. That is, he agrees on March 1 to give $1 million to his borrowers on May 1 in exchange for principal and interest from them every month for the next 20 years.

Like many mortgage bankers, he has no intention of paying the $1 million out of his own pocket. Rather, he intends to sell the mortgages to an insurance company. Thus, the insurance company will actually lend the funds and will receive principal and interest over the next 20 years. Mr. Cooke does not currently have an insurance company in mind. He plans to visit the mortgage departments of insurance companies over the next 60 days to sell the mortgages to one or many of them. He sets April 30 as a deadline for making the sale because the borrowers expect the funds on the following day.

Suppose Mr. Cooke sells the mortgages to the Acme Insurance Co. on April 15. What price will Acme pay for the bonds?

You may think the insurance company will obviously pay $1 million for the loans. However, suppose interest rates have risen above 12 percent by April 15. The insurance company will buy the mortgage at a discount. For example, suppose the insurance company agrees to pay only $940,000 for the mortgages. Because the mortgage banker agreed to lend a full $1 million to the borrowers, the mortgage banker must come up with the additional $60,000 (=$1 million − $940,000) out of his own pocket.

Alternatively, suppose interest rates fall below 12 percent by April 15. The mortgages can be sold at a premium under this scenario. If the insurance company buys the mortgages at $1.05 million, the mortgage banker will have made an unexpected profit of $50,000 (=$1.05 million − $1 million).

(*continued*)

Table 25.3 Effects of Changing Interest Rates on Ron Cooke, Mortgage Banker

	Mortgage Interest Rate on April 15	
	Above 12%	**Below 12%**
Sale Price to Acme Insurance Company	Below $1 million (we assume $940,000).	Above $1 million (we assume $1.05 million).
Effect on Mortgage Banker	He loses because he must lend the full $1 million to borrowers.	He gains because he lends only $1 million to borrowers.
Dollar Gain or Loss	Loss of $60,000 (=$1 million − $940,000).	Gain of $50,000 (=$1.05 million − $1 million).

The interest rate on March 1, the date when the loan agreement was made with the borrowers, was 12 percent. April 15 is the date the mortgages were sold to Acme Insurance Company.

Because Ron Cooke is unable to forecast interest rates, this risk is something that he would like to avoid. The risk is summarized in Table 25.3.

Seeing the interest rate risk, students at this point may ask, "What does the mortgage banker get out of this loan to offset his risk bearing?" Mr. Cooke wants to sell the mortgages to the insurance company so that he can get two fees. The first is an *origination fee*, which is paid to the mortgage banker by the insurance company on April 15—that is, on the date the loan is sold. An industry standard in certain locales is 1 percent of the value of the loan, which is $10,000 (=1% × $1 million). In addition, Mr. Cooke will act as a collection agent for the insurance company. For this service he will receive a small portion of the outstanding balance of the loan each month. For example, if he is paid .03 percent of the loan each month, he will

receive $300 (=.03% × $1 million) in the first month. As the outstanding balance of the loan declines, he will receive less.

Though Mr. Cooke will earn profitable fees on the loan, he bears interest rate risk. He loses money if interest rates rise after March 1, and he profits if interest rates fall after March 1. To hedge this risk, he writes June Treasury bond futures contracts on March 1. As with mortgages, Treasury bond futures contracts fall in value if interest rates rise. Because he *writes* the contract, he makes money on these contracts if they fall in value. Therefore, with an interest rate rise, the loss he endures on the mortgages is offset by the gain he earns in the futures market. Conversely, Treasury bond futures contracts rise in value if interest rates fall. Because he writes the contracts, he suffers losses on them when rates fall. With an interest rate fall, the profit he makes on the mortgages is offset by the loss he suffers in the futures markets.

The details of this hedging transaction are presented in Table 25.4. The column on the left is labeled "Cash Markets" because the deal in the mortgage market is transacted off an exchange. The column on the right shows the offsetting transactions in the futures market. Consider the first row. The mortgage banker enters into a forward contract on March 1. He simultaneously writes Treasury bond futures contracts. Ten contracts are written because the deliverable instrument on each contract is $100,000 of Treasury bonds. The total is $1 million (=10 × $100,000), which is equal to the value of the mortgages. Mr. Cooke would prefer to write May Treasury bond futures contracts. Here, Treasury bonds would be delivered on the futures contract during the same month that the loan is funded. Because there is no May T-bond futures contract, Mr. Cooke achieves the closest match through a June contract.

Table 25.4 **Illustration of Hedging Strategy for Ron Cooke, Mortgage Banker**

	Cash Markets	Futures Markets
March 1	Mortgage banker makes forward contracts to lend $1 million at 12 percent for 20 years. The loans are to be funded on May 1. No cash changes hands on March 1.	Mortgage banker writes 10 June Treasury bond futures contracts.
April 15	Loans are sold to Acme Insurance Company. Mortgage banker will receive sale price from Acme on the May 1 funding date.	Mortgage banker buys back all the futures contracts.
If interest rates rise:	Loans are sold at a price below $1 million. Mortgage banker *loses* because he receives less than the $1 million he must give to borrowers.	Each futures contract is bought back at a price below the sales price, resulting in *profit*. Mortgage banker's profit in futures market offsets loss in cash market.
If interest rates fall:	Loans are sold at a price above $1 million. Mortgage banker *gains* because he receives more than the $1 million he must give to borrowers.	Each futures contract is bought back at a price above the sales price, resulting in *loss*. Mortgage banker's loss in futures market offsets gain in cash market.

If held to maturity, the June contract would obligate the mortgage banker to deliver Treasury bonds in June. Interest rate risk ends in the cash market when the loans are sold. Interest rate risk must be terminated in the futures market at that time. Thus, Mr. Cooke nets out his position in the futures contracts as soon as the loan is sold to Acme Insurance.

Example 25.4 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 25.4

Short versus Long Hedging Margaret Boswell is another mortgage banker. Her firm faces problems similar to those facing Mr. Cooke's firm. However, she tackles the problems through the use of **advance commitments,** a strategy that is the opposite of Mr. Cooke's. That is, she promises to deliver loans to a financial institution *before* she lines up borrowers. On March 1 her firm agreed to sell mortgages to No-State Insurance Co. The agreement specifies that she must turn over 12 percent coupon mortgages with a face value of $1 million to No-State by May 1. No-State is buying the mortgages at par, implying that they will pay Ms. Boswell $1 million on May 1. As of March 1, Ms. Boswell had not signed up any borrowers. Over the next two months, she will seek out individuals who want mortgages beginning May 1.

As with Mr. Cooke, changing interest rates will affect Ms. Boswell. If interest rates fall before she signs up a borrower, the borrower will demand a premium on a 12 percent coupon loan. That is, the borrower will receive more than par on May 1.[11] Because Ms. Boswell receives par from the insurance company, she must make up the difference.

Conversely, if interest rates rise, a 12 percent coupon loan will be made at a discount. That is, the borrower will receive less than par on May 1. Because Ms. Boswell receives par from the insurance company, the difference is pure profit to her.

The details are provided in Table 25.5. As did Mr. Cooke, Ms. Boswell finds the risk burdensome. Therefore, she offsets her advance commitment with a transaction in the futures markets. Because she *loses* in the cash market when interest rates fall, she *buys* futures contracts to reduce the risk. When interest rates fall, the value of her futures contracts increases. The gain in the futures market offsets the loss in the cash market. Conversely, she gains in the cash markets when interest rates rise. The value of her futures contracts decreases when interest rates rise, offsetting her gain.

We call this a *long hedge* because Ms. Boswell offsets risk in the cash markets by buying a futures contract. Though it involves an interest rate futures contract, this long hedge is analogous to long hedges in agricultural and metallurgical futures contracts. We argued at the beginning of this chapter that individuals and firms institute long hedges when their finished goods are to be sold at a fixed price. Once Ms. Boswell makes the advance commitment with No-State Insurance, she has fixed her sales price. She buys a futures contract to offset the price fluctuation of her raw materials—that is, her mortgages.

Table 25.5 Illustration of Advance Commitment for Margaret Boswell, Mortgage Banker

	Cash Markets	Futures Markets
March 1	Mortgage banker makes a forward contract (advance commitment) to deliver $1 million of mortgages to No-State Insurance. The insurance company will pay par to Ms. Boswell for the loans on May 1. The borrowers are to receive their funding from the mortgage banker on May 1. The mortgages are to be 12 percent coupon loans for 20 years.	Mortgage banker buys 10 June Treasury bond futures contracts.
April 15	Mortgage banker signs up borrowers for 12 percent coupon, 20-year mortgages. She promises that the borrowers will receive funds on May 1.	Mortgage banker sells all futures contracts.
If interest rates rise:	Mortgage banker issues mortgages to borrowers at a discount. Mortgage banker *gains* because she receives par from the insurance company.	Futures contracts are sold at a price below purchase price, resulting in *loss*. Mortgage banker's loss in futures market offsets gain in cash market.
If interest rates fall:	Loans to borrowers are issued at a premium. Mortgage banker *loses* because she receives only par from insurance company.	Futures contracts are sold at a price above purchase price, resulting in *gain*. Mortgage banker's gain in futures market offsets loss in cash market.

Example 25.5 – Codable

Chapter 26: Short-Term Finance and Planning

Example 26.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 26.1

Sources and Uses Here is a quick check of your understanding of sources and uses: If accounts payable go up by $100, does this indicate a source or a use? What if accounts receivable go up by $100?

Accounts payable are what we owe our suppliers. This is a short-term debt. If it rises by $100, we have effectively borrowed the money, which is a *source* of cash. Receivables are what our customers owe to us, so an increase of $100 in accounts receivable means that we have loaned the money; this is a *use* of cash.

Example 26.2 – Codable

Example 26.3 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 26.3

Cash Collections All of Fun Toys' cash inflows come from the sale of toys. Cash budgeting for Fun Toys starts with a sales forecast for the next year by quarter:

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Sales ($ in millions)	$100	$200	$150	$100

Fun Toys' fiscal year starts on July 1. Fun Toys' sales are seasonal and are usually very high in the second quarter due to holiday sales. But Fun Toys sells to department stores on credit, and sales do not generate cash immediately. Instead, cash comes later from collections on accounts receivable. Fun Toys has a 90-day collection period, and 100 percent of sales are collected the following quarter. In other words:

$$\text{Collections} = \text{Last quarter's sales}$$

This relationship implies that:

$$\text{Accounts receivable at end of last quarter} = \text{Last quarter's sales} \quad (26.6)$$

We assume that sales in the fourth quarter of the previous fiscal year were $100 million. From Equation 26.6 we know that accounts receivable at the end of the fourth quarter of the previous fiscal year were $100 million, and collections in the first quarter of the current fiscal year are $100 million.

The first quarter sales of the current fiscal year of $100 million are added to the accounts receivable, but $100 million of collections are subtracted. Therefore, Fun Toys ended the first quarter with accounts receivable of $100 million. The basic relation is:

$$\text{Ending accounts receivable} = \text{Starting accounts receivable} + \text{Sales} - \text{Collections}$$

(*continued*)

Table 26.2 shows cash collections for Fun Toys for the next four quarters. Though collections are the only source of cash here, this need not always be the case. Other sources of cash could include sales of assets, investment income, and long-term financing.

Table 26.2 Sources of Cash ($ in millions)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Sales	$100	$200	$150	$100
Cash collections	100	100	200	150
Starting receivables	100	100	200	150
Ending receivables	100	200	150	100

Chapter 27: Cash Management

Example 27.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 27.1

Staying Afloat Suppose you have $5,000 on deposit. One day, you write a check for $1,000 to pay for books, and you deposit $2,000. What are your disbursement, collection, and net floats?

After you write the $1,000 check, you show a balance of $4,000 on your books, but the bank shows $5,000 while the check is clearing. The difference is a disbursement float of $1,000.

After you deposit the $2,000 check, you show a balance of $6,000. Your available balance doesn't rise until the check clears. This results in a collection float of −$2,000. Your net float is the sum of the collection and disbursement floats, or −$1,000.

(*continued*)

Overall, you show $6,000 on your books. The bank shows a $7,000 balance, but only $5,000 is available because your deposit has not been cleared. The discrepancy between your available balance and your book balance is the net float (−$1,000), and it is bad for you. If you write another check for $5,500, there may not be sufficient available funds to cover it, and it might bounce. This is why financial managers have to be more concerned with available balances than book balances.

Example 27.2 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 27.2

Reducing the Float: Part I Instead of eliminating the float, suppose Lambo can reduce it to one day. What is the maximum Lambo should be willing to pay for this?

If Lambo can reduce the float from three days to one day, then the amount of the float will fall from $3,000 to $1,000. From our immediately preceding discussion, we see right away that the PV of doing this is equal to the $2,000 float reduction. Lambo should thus be willing to pay up to $2,000.

Example 27.3 – Codable

Example 27.4 – Codable

Chapter 28: Credit and Inventory Management

Example 28.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 28.1

We'd Rather Fight Than Switch Suppose a company is considering a switch from all cash to net 30, but the quantity sold is not expected to change. What is the NPV of the switch? Explain.

In this case, $Q' - Q$ is zero, so the NPV is just $-PQ$. What this says is that the effect of the switch is simply to postpone one month's collections forever, with no benefit from doing so.

Example 28.2 – Codable

Example 28.3 – Codable

Example 28.4 – Codable

Chapter 29: Mergers, Acquisitions, and Divestitures

Example 29.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 29.1

Merger Basics Suppose Firm *A* acquires Firm *B* in a merger. Further, suppose Firm *B*'s shareholders are given one share of Firm *A*'s stock in exchange for two shares of Firm *B*'s stock. From a legal standpoint, Firm *A*'s shareholders are not directly affected by the merger. However, Firm *B*'s shares cease to exist. In a consolidation, the shareholders of Firm *A* and Firm *B* exchange their shares for shares of a new firm (e.g., Firm *C*).

Example 29.2 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 29.2

Takeover Defenses Suppose on April 2, 2012, Torrance Oil, Inc., a large independent oil refinery, had 28 million shares outstanding, and the company's stock price closed the day before at $49.25 per share on the New York Stock Exchange. Further suppose that on April 2, Torrance's board of directors made two decisions:

1. The board approved management's agreement with the Strauss family of Canada to buy, for $51 a share, the Strauss' 2.6 million shares in Torrance. This was part of a greenmail agreement ending the Strauss family's attempt to control Torrance.
2. The board authorized the company to repurchase 7.5 million shares (27 percent of the outstanding shares) of its stock. The board simultaneously established an employee stock ownership plan to be funded with 4.9 million shares of Torrance stock.

These two actions made Torrance invulnerable to unfriendly takeover attempts. In effect, the company was selling about 20 percent of its stock to the employee stock ownership plan. Earlier, Torrance had put in place a provision that said 80 percent of the stockholders have to approve a takeover. Torrance's stock price fell by $.25 over the next two days. Because this move can probably be explained by random error, there is no evidence that Torrance's actions reduced shareholder value.

Example 29.3 – Codable

Example 29.4 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 29.4

Acquisitions and Accounting Suppose firm *A* acquires Firm *B*, creating a new firm, *AB*. Firm *A*'s and Firm *B*'s financial positions at the date of the acquisition are shown in Table 29.7. The book value of Firm *B* on the date of the acquisition is $10 million. This is the sum of $8 million in buildings and $2 million in cash. However, an appraiser states that the sum of the fair market values of the individual buildings is $14 million. With $2 million in cash, the sum of the market values of the individual assets in Firm *B* is $16 million. This represents the value to be received if the firm is liquidated by selling off the individual assets separately. However, the whole is often worth more than the sum of the parts in business. Firm *A* pays $19 million in cash for Firm *B*. This difference of $3 million (=$19 million − $16 million) is goodwill. It represents the increase in value from keeping the firm as an ongoing business. Firm *A* issued $19 million in new debt to finance the acquisition.

The total assets of Firm *AB* increase to $39 million. The buildings of Firm *B* appear in the new balance sheet at their current market value. That is, the market value of the assets of the acquired firm becomes part of the book value of the new firm. However, the assets of the acquiring firm (Firm *A*) remain at their old book value. They are not revalued upward when the new firm is created.

The excess of the purchase price over the sum of the fair market values of the individual assets acquired is $3 million. This amount is reported as goodwill. Financial analysts generally ignore goodwill because it has no cash flow consequences. Each year the firm must assess the value of its goodwill. If the value goes down (this is called *impairment* in accounting speak), the amount of goodwill on the balance sheet must be decreased accordingly. Otherwise no amortization is required.

Table 29.7 Accounting for Acquisitions: Purchase ($ in millions)

Firm *A*				Firm *B*				Firm *AB*			
Cash	$ 4	Equity	$20	Cash	$ 2	Equity	$10	Cash	$ 6	Debt	$19
Land	16			Land	0			Land	16	Equity	20
Buildings	0			Buildings	8			Buildings	14		
								Goodwill	3		
Total	$20		$20	Total	$10		$10	Total	$39		$39

When the purchase method is used, the assets of the acquired firm (Firm *B*) appear in the combined firm's books at their fair market value.

Chapter 30: Financial Distress

Example 30.1 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 30.1

APR The B. O. Drug Company is to be liquidated. Its liquidating value is $2.7 million. Bonds worth $1.5 million are secured by a mortgage on the B.O. Drug Company corporate headquarters building, which is sold for $1 million; $200,000 is used to cover administrative costs and other claims (including unpaid wages, pension benefits, consumer claims, and taxes). After paying $200,000 to the administrative priority claims, the amount available to pay secured and unsecured creditors is $2.5 million. This is less than the amount of unpaid debt of $4 million.

Under APR, all creditors must be paid before shareholders, and the mortgage bondholders have first claim on the $1 million obtained from the sale of the headquarters building.

The trustee has proposed the following distribution:

Type of Claim	Prior Claim	Cash Received under Liquidation
Bonds (secured by mortgage)	$ 1,500,000	$1,500,000
Subordinated debentures	2,500,000	1,000,000
Common stockholders	10,000,000	0
Total	$14,000,000	$2,500,000

Calculation of the Distribution	
Cash received from sale of assets available for distribution	$2,500,000
Cash paid to secured bondholders on sale of mortgaged property	1,000,000
Available to bond and debenture holders	$1,500,000
Total claims remaining ($4,000,000 less payment of $1,000,000 on secured bonds)	$3,000,000
Distribution of remaining $1,500,000 to cover total remaining claims of $3,000,000	

Type of Claim Remaining	Claim on Liquidation Proceeds	Cash Received
Bonds	$ 500,000	$ 500,000
Debentures	2,500,000	1,000,000
Total	$3,000,000	$1,500,000

Example 30.2 – Non-Codable (Reason: Theoretical example with the purpose of proving a concept)

EXAMPLE 30.2

Chapter 11 Suppose B.O. Drug Co. decides to reorganize under Chapter 11. Generally senior claims are honored in full before various other claims receive anything. Assume that the "going concern" value of B.O. Drug Co. is $3 million and that its balance sheet is as shown:

Assets	$3,000,000
Liabilities	
Mortgage bonds	1,500,000
Subordinated debentures	2,500,000
Stockholders' equity	−1,000,000

The firm has proposed the following reorganization plan:

Old Security	Old Claim	New Claim with Reorganization Plan
Mortgage bonds	$1,500,000	$1,500,000
Subordinated debentures	2,500,000	1,500,000

The firm has also proposed a distribution of new securities under a new claim with this reorganization plan:

Old Security	Received under Proposed Reorganization Plan
Mortgage bonds	$1,000,000 in 9% senior debentures $500,000 in 11% subordinated debentures
Debentures	$1,000,000 in 8% preferred stock $500,000 in common stock

However, it will be difficult for the firm to convince secured creditors (mortgage bonds) to accept unsecured debentures of equal face value. In addition, the corporation may wish to allow the old stockholders to retain some participation in the firm. Needless to say, this would be a violation of the absolute priority rule, and the holders of the debentures would not be happy.

Example 30.3 – Codable

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Example 31.1 – Codable

Example 31.2 – Codable

Example 31.3 – Codable

Example 31.4 – Codable

Example 31.5 – Codable