Feature Walkthrough

For a complete listing of titles of chapter features and their page references, refer to the information found on the inside front cover of this text.

YOUR FINANCIAL WORLD

Pay Off Your Credit Card Debt as Fast as You Can

Credit cards are extremely useful. They make buying things easy—sometimes too easy. While we all plan to pay off our credit card balances every month, sometimes we just don't have the resources. So we take advantage of the loans the card issuers offer and pay off only part of what we owe. Suddenly we find ourselves deeply in debt.

How fast should you pay off your credit card balance? All the bank or finance company that issued the card will tell you is the minimum you have to pay. You get to decide whether to pay more, and your decision makes a big difference. We can use the present-value concept to figure out your alternatives.

Let's take a typical example. You have a balance of $2,000 and can afford to pay at least $50 per month. How many monthly payments will you need to make to pay off the full debt? What if you paid $60 or $75 per month? To find the answer, use equation (12) for the present value of a fixed series of payments. In this case, the present value is the loan amount, $2,000; the fixed monthly payment is $50, $60, or $75; and the interest rate is whatever your credit card company charges per month. Most credit card companies charge between 10 and 20 percent a year. (The average rate is around 13 percent.) We need to figure out the number of payments, or *n* in equation (12).*

Table 4.4 shows the number of months needed to pay off your $2,000 balance at various interest rates and payment amounts. The first entry tells you that if your credit card company is charging a 10 percent annual interest rate (which is comparatively low), and you pay $50 per month, then you will need to make payments for 48.4 months—just over four years.

Looking at the entire table, you can see the advantage of making big payments. Assume you're paying 15 percent, which is realistic. The table shows that increasing your payment from $50 to $60 will allow you to finish paying off your debt in 42.5 months rather than 54.3 months. In other words, paying $10 more a month will allow you to finish paying off the loan one full year sooner. And if you can manage to pay $75 a month, you'll be finished 10 months before that.

Looking more closely, you can see that making large payments is much more important than getting a low interest rate. The lesson is: Pay off your debts as fast as you possibly can. Procrastination is expensive.

Table 4.4 Number of Months to Pay Off a $2,000 Credit Card Debt

Annual Interest Rate	Monthly Payment $50	$60	$75
10%	48.4	38.9	30.1
12%	50.5	40.3	30.9
15%	54.3	42.5	32.2
20%	62.4	47.0	34.5

How fast should you pay off your credit card balance?

SOURCE: © Masterfile

*The most straightforward way to do this is to use a spreadsheet to add up the payments until their present value equals the credit card balance. You can also use equation (A-4) in the appendix of this chapter, which can be solved using logarithms.

YOUR FINANCIAL WORLD

A Guide to Evaluating Risk

Deciding whether a risk is worth taking is extremely difficult, but some simple rules can help. Let's start with the investment described in Table 5.2, where $1,000 yields either $1,400 or $700 with equal probability. If we think about it in terms of gains and losses, this investment offers an equal chance of gaining $400 or losing $300. Should you take the risk? The answer depends on how risk averse you are, but most of us would say no. To see why, let's break the investment down into two parts, the gain and the loss (see Table 5.5).

Taking the gain first, how much would you pay for a 50 percent chance of making $400? Again, the answer depends on your risk aversion, but you surely would pay less than $200, the expected value of such an investment. Let's assume that your answer is $150.

Next, let's turn to the loss. How much would you be willing to pay to avoid a $300 loss altogether? To put it another way, assume that you risk losing $300 and are considering buying insurance against the loss. The insurance company will take the bet for you, losing the $300 in your place if that is the outcome. How much would you be willing to pay an insurance company to avoid taking a 50 percent chance of losing $300? Again, the answer depends on how risk averse you are, but we know that you will pay more than the expected value of the loss, which is $150. (The insurance company would insist on receiving more.) Let's assume you will pay $200 to avoid the loss.

Now we are ready to answer our original question: Is the value of the potential gain sufficient to compensate you for the cost of the potential loss? Subtracting the $200 that you are willing to pay to avoid the $300 loss from the $150 you will pay for the opportunity to gain $400, we get $150 - $200 = -$50, a result less than zero. In short, the potential gain is not big enough to compensate you for the potential loss, so you should not take the risk. In fact, our computation suggests you would be willing to pay $50 *not* to make this investment!

Table 5.5 Evaluating the Risk of a $1,000 Investment

A. The Gain	
Payoff	**Probability**
+$400	$\frac{1}{2}$
$0	$\frac{1}{2}$
B. The Loss	
Payoff	**Probability**
$0	$\frac{1}{2}$
–$300	$\frac{1}{2}$

Deciding if a Risk Is Worth Taking

1. List all the possible outcomes, or payoffs.
2. Assign a probability to each possible payoff.
3. Divide the payoffs into gains and losses.
4. Ask how much you would be willing to pay to *receive* the gain.
5. Ask how much you would be willing to pay to *avoid* the loss.
6. If you are willing to pay more to receive the gain than to avoid the loss, you should take the risk.

Your Financial World

These boxes show students that the concepts taught in the text are relevant to their everyday lives. Among the topics covered are the importance of saving for retirement, the risk in taking on a variable rate mortgage, the desirability of owning stocks, and techniques for getting the most out of the financial news.

APPLYING THE CONCEPT

ENDING DISCRIMINATION IN LENDING

For many years, banks routinely accepted deposits from households in low-income neighborhoods but refused to lend funds to people in those areas. In this practice, known as *redlining,* loan officers would literally draw a line on a map and lend only to those people who lived on one side of the line. The problem was particularly acute in inner cities, where neither businesses nor individuals could obtain financing for normal activities like building and renovation. Redlining contributed to the decline of inner cities, which became increasingly unpleasant and dangerous places.

To understand the reasons for redlining, imagine that a bank's loan officers are considering loan applications from two neighborhoods, each of which offers a wide variety of loan opportunities. These lenders will make loans in both neighborhoods until, holding the interest rate and other relevant factors fixed, the riskiness of the loans in the two neighborhoods is equal. In this way the bank controls its credit risk. But if one of the neighborhoods offers only high-risk opportunities, all the bank's lending will be funneled into the low-risk neighborhood. That is essentially what happened to the inner cities. From the banker's perspective, redlining was just a way to control credit risk. Default rates were so high in some areas, managers said, that responsible lenders simply did not risk lending there.* Unfortunately, given the racial composition of many high-risk neighborhoods, the policy looked discriminatory even though it may have been color-blind.

Applying the Concept

These sections showcase history and examine issues relevant to the public policy debate. Subjects include how debt problems in emerging market countries can create an increase in the demand for U.S. Treasury debt; why Long-Term Capital Management caused a near collapse of the world financial system; and what monetary policy makers learned from the Great Depression of the 1930s.

IN THE NEWS

David Bowie Becomes a Bond

Washington Post

by Jay Mathews

February 6, 1997

David Bowie, the angular British rock star, has never been afraid to try something new. His stage persona has metamorphosed from Ziggy Stardust to Aladdin Sane to the Thin White Duke, with interesting digressions along the way. He has performed with a succession of bands, from the Kon-rads to the King Bees, to the Lower Third, to Tin Machine.

Now Bowie is the first major artist to turn himself into a bond issue—payable over 10 years at 6.9 percent.

The asset-backed bond—the financial instrument that has put $55 million in Bowie's well-tailored pocket—is a device of rapidly growing popularity that already has helped banks turn home loan payments and credit card receivables into big chunks of cash. But until now no one dared to think the annual income from former hits such as "Space Oddity" or "Let's Dance" might appeal to gray-suited executives looking for stable bond investments.

The bond bonus for Bowie is $55 million immediately, instead of in installments as the records sell, and more money than record companies were offering. What he'll do with the money is unclear, but he seems to have been drawn to the deal by its tax advantages.

The reliability of the revenue stream to pay off the bondholders enabled Bowie to get a favorable interest rate. His success could entice other artists with steady royalty payments to go to market, said David Pullman, the 34-year-old senior vice president at Fahnestock & Co. who designed the deal.

Many rock stars have outsold Bowie in the United States, but his avant-garde image and exotic musical tastes still sell an average 1 million records a year all over the planet, according to his business manager, Bill Zysblat. There also is revenue from 250 songs turned into sheet music, commercials, and background music for elevators, offices, voice mail, and many other uses in an age in which profit sources for art are expanding rapidly.

"It just goes to show you that anything can be securitized," said Craig Moyer, senior fixed-income manager at Meridian Investment Co. in Valley Forge, Pennsylvania, part of CoreStates Financial Corp.

Asset-backed bonds began as a way to help banks turn old-fashioned, slow-moving income sources such as credit card and car loan payments into big new cash sources that could be reinvested and turned into even more fees and income.

Moyer said Bowie's $55 million deal would be too small to interest most investors because they would be uncertain of finding buyers if they decided to move their money elsewhere. But, he said, he could imagine some clients who would be drawn to the deal, with an interest rate significantly above the 6.4 percent now paid by 10-year Treasury bonds.

Unlike most singer-songwriters, Bowie had kept control of his copyrights and record masters, and the distribution license for his first 25 albums was due to expire in June. He could have signed a new deal, with a substantial advance, but Pullman said he thought he could get more money upfront through a bond sale.

Zysblat agreed to see how big an advance the record companies were offering, while Pullman tested the feasibility of a bond sale. When they met again, Zysblat said, "his numbers were bigger than my numbers."

Record companies who see profits in turning their backlists of CDs and songs into asset-backed bonds have been asking Zysblat for advice, he said. "I tell them I'm not in that business," he said, "but maybe I will be."

SOURCE: *Copyright © 1997, The Washington Post, reprinted with permission.*

LESSONS OF THE ARTICLE

Virtually anything can be turned into a bond, even the future revenues from the sale of rock music. Here, the revenue from the retail sales of David Bowie's music in all its forms has been turned into an asset-backed security. The benefit to Bowie is that he received a cash payment immediately and shifted the risk that future revenue will be low to the bondholders. Thus buyers of Bowie's bonds must believe that his music will continue to sell well, maintaining the revenue needed to make the promised payments. As it turns out, the entire $55 million bond issue, which had a risk premium of 0.5 percent over U.S. Treasury bonds (6.9 percent minus 6.4 percent), was purchased by a single insurance company. This company realized the bonds offered a type of diversification that is hard to come by, as the risk that David Bowie will become unpopular is surely uncorrelated with almost every other investment out there.

In the News

One article per chapter from major media such as *The New York Times*, *The Economist*, *The Financial Times*, *The Wall Street Journal*, and *BusinessWeek* is featured. These readings show how concepts introduced in the chapter are applied in the financial press. A brief analysis of the article, called "Lessons," reinforces key concepts.

TOOLS OF THE TRADE

Computing Compound Annual Rates

Comparing changes over days, months, years, and decades can be very difficult. If someone tells you that an investment grew at a rate of $\frac{1}{2}$ percent last month, what should you think? You're used to thinking about growth in terms of years, not months. The way to deal with such problems is to turn the monthly growth rate into a *compound-annual rate*. Here's how you do it.

An investment whose value grows $\frac{1}{2}$ percent per month goes from 100 at the beginning of the month to 100.5 at the end of the month. Remembering to multiply by 100 to convert the decimal into a percentage, we can verify this:

$$100\left(\frac{100.5-100}{100}\right)=100\left[\left(\frac{100.5}{100}\right)-1\right] = 0.5\%$$

To convert this monthly rate to an annual rate, we need to figure out what would happen if the investment's value continued to grow at a rate of $\frac{1}{2}$ percent per month for the next 12 months. We can't just multiply 0.5 times 12. Instead, we need to compute a 12-month compound rate by raising the one-month rate to the 12th power. Assuming that our index starts at 100 and increases by $\frac{1}{2}$ percent per month, we can use the expression for a compound future value to compute the index level 12 months later. Remembering to convert percentages to their decimal form, so that 0.5 percent is 0.005, we find the result is

$$FV_n = PV(1 + i)^n = 100\ (1.005)^{12} = 106.17,$$

an increase of 6.17 percent. That's the compound annual rate, and it's obviously bigger than the 6 percent result we get from just multiplying 0.5 by 12. The difference between the two answers—the one you get by multiplying by 12 and the one you get by compounding—grows as the interest rate grows. At a 1 percent monthly rate, the compounded annual rate is 12.68 percent.

Another use for compounding is to compute the percentage change per year when we know how much an investment has grown over a number of years. This rate is sometimes referred to as the *average annual rate*. Say that over five years an investment has increased 20 percent, from 100 to 120. What annual increase will give us a 20 percent increase over five years? Dividing by 5 gives the wrong answer because it ignores compounding; the increase in the second year must be calculated as a percentage of the index level at the end of the first year. What is the growth rate that after five years will give us an increase of 20 percent? Using the future-value formula,

$$FV_n = PV(1 + i)^n$$

$$120 = 100\ (1 + i)^5$$

Solving this equation means computing the following:

$$i = \left[\left(\frac{120}{100}\right)^{1/5} - 1\right] = 0.0371$$

This tells us that five consecutive annual increases of 3.71 percent will result in an overall increase of 20 percent. (Just to check, we can compute $(1.0371)^5 = 1.20 = 120/100$.)

Tools of the Trade

These boxes teach useful skills, including how to read bond and stock tables, how to read charts, and how to do some simple algebraic calculations. Some provide brief reviews of material from the principles of economics course, such as the relationship between the current account and the capital account in the balance of payments.

... Income, in co... st, ... of earnings over time. **Wealth** is the value of assets minus liabilities. Money is one of those assets, albeit a very minor one.

Money, in the sense we are talking about, has three characteristics. It is (1) a means of payment, (2) a unit of account, and (3) a store of value. The first of these characteristics is the most important. Anything that is used as a means of payment must be a store of value and thus is very likely to become a unit of account. Let's see why this is so.

Means of Payment

INFORMATION

The primary use of money is as a **means of payment**. Most people insist on payment in money at the time a good or service is supplied because the alternatives just don't work very well. Barter, in which a good or service is exchanged directly for another good or service, requires that a plumber who needs food find a grocer who needs a plumbing repair. Relying on this "double coincidence of wants" surely causes the economy to run less smoothly. The plumber could pay for his breakfast cereal with a "promise" of plumbing services, which the grocer could then transfer to someone else. But while it would be possible to certify the plumber's trustworthiness, certainly taking payment in money is easier. Money finalizes payments so that buyers and sellers have no further claim on each other. That is money's special role. In fact, so long as a buyer has money, there is nothing more the seller needs to know.

As economies have become more complex and physically dispersed, reducing the likelihood that a seller will have good information about a buyer, the need for money has grown. The increase in both the number of transactions and the number of potential buyers and sellers (the vast majority of whom may never even have seen one another) argues for something that makes payment final and whose value is easily verified. That something is money.

Unit of Account

Just as we measure length using feet and inches, we measure value using dollars and cents. Money is the **unit of account** that we use to quote prices and record debts. We could also refer to it as a standard of value.

Having a unit of account is a...

Core Principle Marginal Icons

The entire text discussion is organized around the following five core principles: Time has value; risk requires compensation; information is the basis for decisions; markets set prices and allocate resources; and stability improves welfare. Exploring these principles is the basis for learning what the financial system does, how it is organized, and how it is linked to the real economy. They are discussed in detail in Chapter 1; throughout the rest of the text, marginal icons remind students of the principles that underlie particular discussions.