Chapter 14  
  
Long-Term Financing

In [Chapter 5](https://jigsaw.chegg.com/books/9780808046912/epub/EPUB/xhtml/08_Chap05.xhtml) it was noted that long-term debt is one primary source of the money that organizations need to fund their operations. This chapter takes a closer look at the primary sources of long-term debt: long-term notes, mortgages, bonds, and leases. Debt financing represents money the organization borrows that will be repaid in the future, usually with interest. It is referred to as long-term debt if it will be paid back more than one year into the future.

**LONG-TERM NOTES**

One form of long-term debt occurs when an organization borrows money and signs a note promising repayment. The note indicates the specific terms under which the money has been borrowed, such as the interest rate and timing of payments. Long-term notes are often unsecured loans. This means that the organization as a whole owes the money, but there is no one specific asset that the organization pledges as collateral to ensure repayment. Thus, the lender is considered to be an “unsecured” creditor. If the organization has problems making payments on its obligations, all unsecured creditors share whatever resources are available to repay the organization’s various unsecured obligations.

In contrast, a lender can ask for collateral. Collateral is a specific asset the lender can claim if the borrower fails to make payment of amounts due. For example, if the organization has made an investment buying 10,000 shares of Microsoft stock, it may offer that stock as collateral when it later borrows money. When there is specific collateral associated with a loan the creditor is considered to be a secured creditor.

By providing the lender with specific valuable collateral, the loan is less risky. Therefore, the lender is more likely to be willing to make the loan and to charge a lower interest rate. In general, the greater the likelihood that a borrower will not be able to repay a loan, the higher the interest rate charged unless there is adequate collateral.

**MORTGAGES**

Mortgages are loans secured by real property. Real property is land and anything attached to it. That means a building is real property, but equipment within the building is not. There are different possible types of payment arrangements for mortgages. Some do not require any repayment of principal for a number of years, and then a large “balloon” payment is made. It is more common, however, for a mortgage to require equal payments at the end of each month throughout the term of the loan. The equal mortgage payments each include some interest and some principal repayment.

The portion of each monthly payment that is interest and the portion that is principal changes from payment to payment. Why is that the case? Since each mortgage payment repays part of the loan, after the payment the organization owes the lender less money. Interest is a payment on the amount of money that is owed. As the amount owed declines, the required interest payment declines as well. Since the monthly mortgage payment is calculated as a constant monthly payment, the same each period, the repayment portion increases as the interest portion of the payment declines.

For example, suppose that Coffin Corporation took out a $500,000 mortgage loan to build a new structure. The terms of the loan were 12 percent interest, with equal monthly payments for 3 years. How much would the annual mortgage payment be? We can use Excel to solve this as follows:

=PMT(rate, nper, pv, fv, type)

=PMT(12%/12, 3\*12, 500000, ,0)

=$16,607.15

You can get a good idea of the relationship between interest and principal on a mortgage by looking at a mortgage repayment schedule, such as the one in [Exhibit 14-1](https://jigsaw.chegg.com/books/9780808046912/epub/EPUB/xhtml/08_Chap14.xhtml#e14-1). In that Exhibit, the loan amount at the beginning of each month is in a column labeled A. The monthly payment is in the column labeled B. Note that this payment is the same each month. The interest is 12% per year, or 1% each month (12% divided 12 months = 1% per month). The interest amount (Column C) is found by taking the amount owed (from Column A) and multiplying it by 1%. The portion of the monthly payment (Column B) which is a repayment of part of the loan principal (Column D) is found by subtracting the interest in Column C from the monthly payment in Column B. The principal amount of the loan still owed at the end of the month (Column E) is the starting balance from Column A, less the amount of loan repayment from Column D. That ending balance for the month, then transfers over to Column A to become the beginning loan balance for the start of the next month. Notice how the interest portion of the monthly payment declines over time, and the amount of monthly loan repayment of principal rises over time. At the end of the three year life of the mortgage loan, the loan balance just reaches zero.

**EXHIBIT 14-1  
Mortgage Repayment Schedule**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Month | Principal Owed at Beginning of Month (A) | Monthly Payment (B) | Interest at 1% Per Month (C=1%×A) | Repayment of Principal (D=B−C) | Principal Owed at End of Month (E=A−D) |
| 1 | $500,000 | $16,607 | $5,000 | $11,607 | $488,393 |
| 2 | $488,393 | $16,607 | $4,884 | $11,723 | $476,670 |
| 3 | $476,670 | $16,607 | $4,767 | $11,840 | $464,829 |
| 4 | $464,829 | $16,607 | $4,648 | $11,959 | $452,870 |
| 5 | $452,870 | $16,607 | $4,529 | $12,078 | $440,792 |
| 6 | $440,792 | $16,607 | $4,408 | $12,199 | $428,593 |
| 7 | $428,593 | $16,607 | $4,286 | $12,321 | $416,271 |
| 8 | $416,271 | $16,607 | $4,163 | $12,444 | $403,827 |
| 9 | $403,827 | $16,607 | $4,038 | $12,569 | $391,258 |
| 10 | $391,258 | $16,607 | $3,913 | $12,695 | $378,563 |
| 11 | $378,563 | $16,607 | $3,786 | $12,822 | $365,742 |
| 12 | $365,742 | $16,607 | $3,657 | $12,950 | $352,792 |
| 13 | $352,792 | $16,607 | $3,528 | $13,079 | $339,713 |
| 14 | $339,713 | $16,607 | $3,397 | $13,210 | $326,503 |
| 15 | $326,503 | $16,607 | $3,265 | $13,342 | $313,161 |
| 16 | $313,161 | $16,607 | $3,132 | $13,476 | $299,685 |
| 17 | $299,685 | $16,607 | $2,997 | $13,610 | $286,075 |
| 18 | $286,075 | $16,607 | $2,861 | $13,746 | $272,329 |
| 19 | $272,329 | $16,607 | $2,723 | $13,884 | $258,445 |
| 20 | $258,445 | $16,607 | $2,584 | $14,023 | $244,422 |
| 21 | $244,422 | $16,607 | $2,444 | $14,163 | $230,259 |
| 22 | $230,259 | $16,607 | $2,303 | $14,305 | $215,955 |
| 23 | $215,955 | $16,607 | $2,160 | $14,448 | $201,507 |
| 24 | $201,507 | $16,607 | $2,015 | $14,592 | $186,915 |
| 25 | $186,915 | $16,607 | $1,869 | $14,738 | $172,177 |
| 26 | $172,177 | $16,607 | $1,722 | $14,885 | $157,291 |
| 27 | $157,291 | $16,607 | $1,573 | $15,034 | $142,257 |
| 28 | $142,257 | $16,607 | $1,423 | $15,185 | $127,073 |
| 29 | $127,073 | $16,607 | $1,271 | $15,336 | $111,736 |
| 30 | $111,736 | $16,607 | $1,117 | $15,490 | $96,246 |
| 31 | $96,246 | $16,607 | $962 | $15,645 | $80,602 |
| 32 | $80,602 | $16,607 | $806 | $15,801 | $64,801 |
| 33 | $64,801 | $16,607 | $648 | $15,959 | $48,841 |
| 34 | $48,841 | $16,607 | $488 | $16,119 | $32,723 |
| 35 | $32,723 | $16,607 | $327 | $16,280 | $16,443 |
| 36 | $16,443 | $16,607 | $164 | $16,443 | $0 |

**BONDS**

When organizations borrow large amounts of money, they often issue a bond. Bonds are agreements to borrow and repay money with specific stated, face or maturity values. The stated, face, or maturity value is the amount that will be repaid at the end of the loan period, called the maturity date. Suppose that Coffin Corporation wishes to borrow $100 million for 20 years for a major expansion. That $100 million is the maturity value and 20 years from now is the maturity date. Bonds typically pay interest every six months, in which case they are referred to as  semiannual bonds.

Many individuals each lend a portion of the total amount to the organization in exchange for the organization’s promise to repay the loan. That promise is evidenced by a formal document called a bond. For example, one person might lend money to the organization in exchange for a $5,000 bond. The organization promises to make regular interest payments and to repay the full $5,000 face value at the maturity date. Although we are lending money to the organization, we often speak of buying and selling bonds. This is because the bond obligation is often transferable. After lenders lend money to the organization and receive bonds in exchange, they can wait until the maturity date to get their money back. However, they do not have to wait. They can sell the bond to someone else. Then the borrowing organization will pay interest and principal to the person who purchased the bond obligation.

Organizations issue bonds rather than simply borrowing money from a bank for three major reasons: to spread risk, to eliminate a middleman, and in some cases to obtain a lower rate due to tax issues. First, if one lender were to lend a very large amount of money to one borrower, the lender would be taking a tremendous risk. No one bank would want to lend $100 million to Coffin. The firm’s failure to repay the loan could have a devastating impact on the bank. Lenders would prefer to lend smaller amounts to a larger number of borrowers. Second, lenders such as banks are lending other people’s money. People put money in bank accounts, and the bank lends the money to the borrower. The bank acts as an intermediary or middleman between the individual with the money and the borrower who needs the money. If the borrower can eliminate that middleman, it can save that cost. Finally, in the case of governments or not-for-profit organizations, bonds can sometimes be issued that pay interest which is tax-exempt. That means the recipient of the interest doesn’t have to pay federal and possibly state tax on that interest income. These so-called municipal bonds often are issued at a lower interest rate because of the tax benefit to the lender. That lower rate potentially saves the borrower a lot of money.

Why not use bonds for all loans? Why would we ever borrow from a bank if we are then paying an extra middleman? Issuing a bond is costly. It is expensive to find individual investors who are willing to lend money to the borrower. A large sales force is needed, and commissions must be paid. Lawyers are needed to protect the interests of the lender and borrowers. Accountants are needed to track the bond payments. Investment banking firms undertake and coordinate this costly process. It generally does not pay to incur all the costs related to issuing a bond if only a relatively small amount of money is borrowed. The lower interest on the bonds would not offset the high issuance costs.

#### Call Provisions

Many issuers of bonds are concerned by the long time-frame involved. If a corporation issues a bond for thirty years when interest rates are high, it would be obligated to pay those high interest rates for the full term of the loan, even if subsequent changes in the economy result in falling interest rates. To deal with this, many bond issuers insert a clause in their bond agreements that allows them to repay the bond early. This is called a call provision. When a bond is called, that means that the borrower chooses to repay the bond early.

Suppose that 10 years have gone by, and the borrowing rate for Coffin has fallen from 8 percent to 4 percent. The corporation might borrow money at 4 percent and use it to call in and pay off the outstanding 8 percent bond. This puts lenders in an unfavorable position. If market interest rates go up, lenders will not benefit from that rise because they have lent money for a long period at a fixed rate. But if market interest rates drop, the bond will be called and the lenders will be repaid at a time when they can only reinvest their money at a lower rate. Therefore, to make up for this unbalanced situation, lenders demand a higher interest rate payment for a bond with a call provision than for one without such a provision.

#### Calculating Bond Payments and Values

Bonds have a specific stated interest rate, such as 10 percent. The organization promises to pay interest at that rate on the bond obligation. Therefore, a 10 percent, $5,000 bond with annual interest payments would pay $500 of interest every year until the bond matures. At that point, the organization would make the last interest payment and also repay the $5,000 face value. Usually, interest payments on bonds are made semiannually. In that case, this bond would make a payment of $250 every six months until the maturity date.

However, bonds are not always issued or sold at their maturity value. In fact, they are usually issued and also subsequently bought and sold for a higher or lower price, because interest rates are constantly fluctuating. For example, assume a 20-year, 10 percent, semiannual bond. What if the bond is about to be issued, but interest rates rise in the general economy? No one will be willing to lend money to get 10 percent if they can get 12 percent elsewhere. The organization must offer to sell (issue) the bonds at a discount. (If interest rates have instead decreased, then the organization will be able to charge a premium for the bond, and will receive more than its face value.)

The actual amount to be paid for a bond is calculated using time value of money (TVM) computations. A bond represents a promise to make periodic interest payments and a repayment of principal. If we know the current interest rate in the marketplace, the number of compounding periods, and the future interest and principal payments, we can find the PV, which is the amount an investor would give to get the bond, and its promised payments.

What would Coffin receive today if it issued a $100 million bond offering at a 10 percent stated interest rate with interest paid semiannually and the maturity in 20 years? Assume that interest rates in the general marketplace have risen to 12 percent.

First, since the bond pays interest semiannually, there are two compounding periods per year. A 20-year bond would have 40 compounding periods. Bonds typically pay interest semiannually, and semiannual compounding is the usual convention. The number of compounding periods is used to compute the PV of both the interest and the principal payments.

Second, note that the stated interest rate is used to determine the interest payments that will take place over time. A $100 million bond at 10 percent would pay interest of $10 million per year, or $5 million every six months.

Next, we need to find the PV of an annuity of $5 million each period for 40 periods at a current market interest rate of 6 percent per period (i.e. 12% per year divided by two compounding periods per year = 6% per half year period), plus the PV of the single future payment of $100 million paid 40 periods from now with an market interest rate of 6 percent. The value of the bond is determined by the current market rate rather than the stated rate. The stated interest rate only is used to determine the specific amount of the semiannual interest payments.

By taking the PV of the periodic interest payments and the future principal payment, we find the value of the bond today at current interest rate conditions. For the Coffin bond mentioned previously, the future value, FV, is the $100,000,000 maturity payment; the periodic interest payments, PMT, are the semiannual $5,000,000 payments; the number of compounding periods is 40 six-month periods; and the interest rate is the 6 percent semiannual current market rate:

=PV(rate, nper, pmt, fv, type)

=PV(6%, 40, 5000000, 100000000, 0)

= ($84,953,703.13)

Coffin will receive $84,953,703.13 from the lenders when they issue the bond. Note that this is shown as a negative number in the computation because it is the amount that lenders would be willing to pay (cash outflow) in order to later receive (cash inflow) the interest payments of $5 million every six months and the maturity payment of $100 million at the end. Notice that even though the lenders are only lending about $85 million, they will receive $100 million at maturity. That is because the $5 million interest payments are inadequate to provide a 12% yield on the money they lent. By paying $5 million every six months and $100 million at the end it works out that the lenders are just earning exactly 12% on the $84,953,703.13 that they are lending to Coffin.

Note that the difference in the interest rates in this example are extreme. Interest rates vary by one 100th of a percent. A 10 percent face value bond might be issued when interest rates are 10.02 percent or 9.97 percent. A jump from 10 percent to 12 percent is fairly large. Thus, the value of a bond at the time of issuance is not likely to vary nearly as much from the face value as in this example. Over time, however, after 5 or 10 years have passed, wider variations in interest rates are common. If the bond is sold by the original lender to a different investor, a new PV calculation is essential to determine a price for the bond that will yield the current market rate at the time the bond is being sold.

Keep in mind one critical point. The stated interest rate on a bond is only used to compute the interest payments that will be made. So if a bond is an 8%, $5,000, semiannual bond, we use the 8% to find the interest per year of $400 (i.e. 8% × $5,000 = $400), then divide that by 2 since it is a semiannual bond. We now know the interest to be paid every six months is $200. We do not use the 8% to find the PV of the bond. A bond’s value is determined using the current market interest rate.

### LEASES

A lease is an arrangement where the owner of an asset, called the lessor, allows someone else (the lessee) to use the asset for a period of time in exchange for monthly payments, called lease payments.

#### Management Considerations for Leasing

Many financial managers are strong supporters of leasing due to the added flexibility it provides. If you know you’ll need a piece of equipment for only half of its useful life, a lease can eliminate the effort required to dispose of the asset after you no longer need it. If you’re afraid that technology will make the item obsolete, a cancelable lease can protect you.

A lease also provides a greater degree of financing. Purchases financed by a mortgage typically require a down payment of perhaps 20 percent or more. Banks are quite reluctant to lend 100 percent of the cost for any item they use as collateral. Therefore, the firm with a great idea but no cash may not be able to get started. A lease provides an alternative way to start production with less equity financing.

Leases, however, tend to cost more than mortgages. We would expect that, considering the risk and return issues. Certainly the leasing company bears more risk than a mortgagor does, if only because it bears all of the normal risks of ownership, such as assuring that fire insurance is maintained. Further, while the lessee has more flexibility to avoid technological obsolescence, the lessor charges a higher rent because of added risk. The same thing is true with respect to 100 percent financing. The potential loss due to lessee default is greater to the lessor than to the mortgagor because there is no sizable down payment to absorb losses on foreclosure sales.

In some cases, leasing may be more efficient. Consider the firm that needs two autos. If it leases the autos, it may pay more for the autos than if it bought them outright, but it might get a wholesale service contract with the lease. The leasing company is willing to give a discount on service to get the lease. On the other hand, if the firm needs 2,000 autos, all in one geographic area, it might pay to buy them and open its own auto repair shop, thus maintaining the autos at cost, rather than wholesale or retail rates.

One final consideration: Who owns the property at the end of the lease? Well, unless it is specified one way or the other in the lease contract, the property belongs to the lessor. The lessor stands to gain from any increase in the value of the property. Frequently, the right of ownership upon termination of the lease is given to the lessee for “free.” In such leases, the monthly or annual lease payments are higher than they would have to be if the lessor retained ownership of the property.

None of these managerial considerations provide absolute weight in favor of or against leasing. There are some benefits for the lessee, but they tend to raise the risk to the lessor, who therefore charges a higher price. Clearly, by adding a lessor instead of buying direct, we have brought in a participant who will want to earn a profit. This profit must come from the lease payments. As we turn to our next section, however, it will become apparent that tax considerations can provide a situation in which the lessor and the lessee may both clearly benefit from a lease arrangement.

#### Tax Considerations for Leasing

##### *Tax Bracket Shifting*

Suppose that a taxpayer in a low tax bracket—perhaps 15 percent—was anticipating buying a machine directly versus leasing it from a taxpayer in the 35 percent tax bracket. Every dollar of depreciation taken as a deduction by the taxpayer in a 15 percent tax bracket would reduce taxes paid by him  or her to the government by 15 cents. If the taxpayer in the 35 percent bracket takes that same dollar of depreciation as a tax deduction, it will reduce his or her taxes by 35 cents. Therefore, there is a tax savings if a high tax bracket taxpayer buys property and leases it to a lower tax bracket taxpayer. The high tax bracket taxpayer gets the depreciation deduction, and can share the benefit with the low tax bracket payer through lower lease rental charges. (Note that the value of this approach has been lessened substantially by IRS Passive Activity Loss rules, which limit allowable deductions.)

##### *Sale and Leaseback*

Developed real estate is commonly sold and then leased back by the seller. This “sale and leaseback” technique allows for effective depreciation of land for tax purposes. If we simply own an office building, we can depreciate the building, but not the land it sits on. If we sell the building and lease it back, all of the lease payments are deductible. In areas where land is expensive, this can result in substantial tax savings.

Care must be exercised, however. First, if the real estate is sold at a profit, taxes are paid on the gain. Second, once sold, any subsequent increases in value belong to the new owner.

##### *Alternative Minimum Tax*

The Alternative Minimum Tax (AMT) also has interesting implications for leasing. The AMT is designed to ensure that taxpayers pay at least some minimum tax on their income. Deductions, which may be generated by leases, can trigger the AMT. However, it is an extremely complicated area, and is beyond the scope of this book. In general, tax issues with respect to leasing are extremely complex. There are a number of potential pitfalls. The discussion here should alert you to the fact that even if a lease doesn’t have strong managerial rationale, the tax consequences may make it attractive. However, you must seek out the advice of a tax expert to review the specifics of any potential lease. The tax law in this area is extremely volatile. Congress closes loopholes as fast as it opens them. You cannot be advised strongly enough that a lease should not be undertaken without a tax expert specifically reviewing the tax consequences of the lease.

### KEY TERMS

Unsecured loans—a loan where the organization owes the money, but there is no one specific item that the organization pledges as collateral to ensure repayment.

Collateral—a specific asset the lender can claim if the borrower fails to make payment of amounts due.

Secured creditor—a creditor whose loan to the organization is secured by collateral.

Mortgage—loans secured by real property.

Real property—land and anything attached to it.

Bond—agreement to borrow and repay money with specific stated, face or maturity values and a specific interest rate.

Stated, face or maturity value of a bond—the amount that will be repaid at the end of the loan period, called the maturity date.

Call provision—a clause in the bond contract between the borrower and the lender that allows the borrower to repay (call in) the bond early.

Discount—the amount a bond sells for below its face value because the market place demands a higher interest rate than the bond’s stated interest rate.

Premium—the amount a bond sells for above its face value because the market place is willing to accept a lower interest rate than the bond’s stated interest rate.

**QUESTIONS FOR REVIEW**

1. What is the difference between a secured and unsecured loan?
2. Over time, does the interest portion of each mortgage payment go up or down?
3. How would you find the amount that would be paid monthly on a 30-year mortgage?
4. What is the stated rate of interest on a bond used to compute?
5. Assume that a 30 year, 5%, semiannual, $10,000 bond was issued ten years ago. Today current market rates are 4.5%. How much could that bond be sold for today?
6. What are some of the non-tax related advantages of leasing?
7. What are some disadvantages of leasing?
8. What are some tax considerations of leasing?