Markets for Financial Capital

Having seen how markets for physical capital work, let us turn to the examination of markets for financial capital. As we discussed, firms that want to acquire physical capital need to obtain financial capital. They can obtain financial capital by issuing stocks and bonds. Stocks and bonds are traded on financial markets. Their prices are determined by the actions of buyers and sellers, like prices in any other market. Understanding what drives the prices of stocks and bonds is important for determining firms’ ability to acquire financial capital. It is also important for investors who buy stocks and bonds as a way to save for their future retirement or simply as a way to make money.

Stock Prices and Rates of Return

Prices of the stocks of most large firms can be found in daily newspapers. Investors are interested in buying those stocks whose prices are likely to rise and that are more likely to pay back their profits to shareholders in the form of dividends. We can define the annual return from holding a stock as the dividend plus the capital gain during the year. The capital gain during the year is the increase in the price of the stock during the year. A capital loss is a negative capital gain: a decrease in the price. When comparing dividends across companies, we typically look at the dividend yield, that is, the dividend stated as a percentage of the price. Similarly, in comparing returns across companies, we typically look at the rate of return, that is, the return stated as a percentage of the price of the stock.

A simple example can illustrate these terms. For example, the dividend for Hewlett-Packard in 2006 was $0.32 per year. At its year-end stock price of $41.19, the dividend yield was 0.8 percent. During 2006, the price of Hewlett-Packard stock rose from $29.28 to $41.19, a capital gain of $11.91. Combined with the dividend, the total return was $12.23, a rate of return of 41.8 percent. In this example, the capital gain is a much bigger portion of the rate of return than the dividend.

But stock market returns are not always as good as in this example. Consider the same company two years later: Hewlett-Packard’s stock price fell from $50.48 to $36.29 per share during 2008, a negative capital gain or a capital loss of $14.19. Including the $0.32 in dividends it paid during the year, Hewlett-Packard’s total rate of return was negative 27.5 percent. 2008 was not a good year for stocks. The stock price of Caterpillar, the famous maker of large-scale construction equipment, fell from $72.56 to $44.67 during the year. Including a $1.56 dividend payout, its return was negative 36.3 percent. Indeed, the average stock price of all the 500 major U.S. companies—as measured by the Standard and Poor’s (S&P) 500 Index—fell by 38.5 percent during 2008, which substantially cut into gains made in the previous two decades, as shown in Figure 16-1.

You can figure out which firms are the most profitable, and hence more likely to generate a high rate of return for their shareholders, by looking at firms’ accounting profits, also known as earnings. Firms pay out some of their profits as dividends; the rest of the profits are retained and invested in physical capital or research. Stock tables list the price-earnings ratio: the price of the stock divided by the annual earnings per share. The price-earnings ratio for Hewlett-Packard in 2006 was 17.1. With the price of the stock at $41.19, this means that earnings for the year were $2.4088 per share ($41.19/$2.4088 = 17.1). A firm’s earnings ultimately influence the return on the firm’s stock, so the price-earnings ratio is watched closely.

Bond Prices and Rates of Return

Bond prices for both corporate and government bonds also can be found in the financial pages of the newspaper. The Economics In Action box in this chapter shows you how to read the prices of different types of bonds.
A bond has four key characteristics: 

- **coupon**: the fixed amount that a borrower agrees to pay to the bondholder each year.
- **maturity date**: the date when the principal on a loan is to be paid back.
- **face value**: the principal that will be paid back when a bond matures.
- **yield**: the annual rate of return on a bond if the bond were held to maturity.

Here is a typical quote on bond yields:

“The price of the 30-year Treasury bond rose less than 1/8 point, or less than $1.25 for a bond with $1,000 face value, to 84 4/32. Its yield, which moves in the opposite direction of its price, dropped to 7.60 percent from 7.61 percent on Thursday.”

Why are bond yields different from the coupon rate? An inverse, or negative, relationship exists between the yield and the price. They have an inverse relationship because the payments of the bond are fixed—the borrower (bond issuer) agrees to pay back the lender (bondholder) the principal on the maturity date and make coupon payments in the interim—regardless of what the buyer paid for the bond. The higher the price you pay today to get this fixed stream of interest and principal payments in the future, the lower the rate of return (yield) you earn. So unlike the coupon rate, which stays fixed, the yield will fluctuate with price. Furthermore, as the price rises, the yield will fall, and vice versa.

Why do bond yields fluctuate? Consider a simple example. Suppose you just bought a one-year bond for $100 that says that the government will pay 5 percent of the face value, or $5, plus $100 at the end of the one-year period. Now suppose that just after you bought the bond, interest rates on bank deposits suddenly jumped to 10 percent. Your bond says that you earn 5 percent per year, so if you hold it for the entire year, your rate of return is less than you could get on a bank deposit. Suddenly the bond looks much less attractive.

You would not be able to get $100 for the bond. The price would decline until the rate of return on the bond was close to the interest rate at the bank. For example, if the price fell to $95.45, then the payment of $105 at the end of the year would result in a 10 percent rate of return [that is, 0.10 = (105 – 95.45)/95.45]. In other words, the yield on the bond would rise until it reached a value closer to 10 percent than to 5 percent.

If you look at the U.K. government bonds in the box, you will notice a bond maturing in 2017 with a coupon rate of 8.75 percent and a yield of 4.75. This bond must have been issued at a time when market interest rates were closer to 8.75 percent. As interest rates in the United Kingdom fell, people found that holding the bond was a more attractive proposition than keeping money in the bank, so they bid up the price of the bond, driving down the yield until it approached the new market interest rates in the United Kingdom. This implies that periods of falling interest rates are good for bondholders and bond issuers because the prices of their bonds rise, while periods of rising interest rates are bad for both bondholders and bond issuers.

On the basis of these considerations, we can use a formula to calculate the relationship between the price and the yield for bonds of any maturity. Let $P$ be the price of the...
Let $R$ be the coupon. Let $F$ be the face value. Let $i$ be the yield. The formula relating to the price and the yield in the case of a one-year bond is indicated in the first row of Table 16-1.

For a one-year bond, a coupon payment of $R$ is paid at the end of one year together with the face value of the bond. The price $P$ is what you would be willing to pay now, in the present, for these future payments. It is the present discounted value of the coupon payment plus the face value at the end of the year. By looking at the formula in the first row of Table 16-1, you can see the negative relationship between the price ($P$) of the bond and the yield ($i$) on the bond. The higher the yield, the lower the price; and conversely, the lower the yield, the higher the price.

A two-year-maturity bond is similar. You get $R$ at the end of the first year and $R$ plus the face value at the end of the second year. Now you want to divide the first-year payment by $1 + i$ and the second-year payment by $(1 + i)^2$. The formula still shows the inverse relationship between the yield and the price. A bond with a three-year or longer maturity is similar. Computers do the calculation for the news reports, so even 30-year bond yields can easily be found from their price.

We can use a convenient and simple approximation method to determine the price or yield on bonds with very long maturity dates. It says that the price is equal to the coupon divided by the yield: $P = R/i$. This formula is the easiest way to remember the inverse relationship between the price and the yield. It is a close approximation for long-term bonds like the 30-year bond.

**Table 16-1**

<table>
<thead>
<tr>
<th>Bond Price Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>One-year maturity:</strong> $P = \frac{R}{1+i} + \frac{F}{1+i^2}$</td>
</tr>
<tr>
<td><strong>Two-year maturity:</strong> $P = \frac{R}{1+i} + \frac{R}{(1+i)^2} + \frac{F}{(1+i)^3}$</td>
</tr>
<tr>
<td><strong>Three-year maturity:</strong> $P = \frac{R}{1+i} + \frac{R}{(1+i)^2} + \frac{R}{(1+i)^3} + \frac{F}{(1+i)^4}$</td>
</tr>
<tr>
<td><strong>For very long term:</strong> $P = \frac{R}{i}$</td>
</tr>
</tbody>
</table>

**REVIEW**

- Firms that want to purchase physical capital need financial capital to do so. They obtain financial capital by issuing stocks and bonds. Stocks and bonds are traded on financial markets.
- The return from holding stock is the dividend plus the change in the price. The rate of return is equal to the return measured as a percentage of the price of the stock.
- The return from holding bonds to maturity is the yield of the bond. Bond yields and bond prices move in opposite directions.
- Periods of falling interest rates are good for bondholders and bond issuers because the prices of bonds rise, while periods of rising interest rates are bad for both bondholders and bond issuers.
Newspaper stock tables, such as this one from the Financial Times (March 1, 2007), summarize information about firms and the stocks that they issue. The table here is part of a much bigger table in which all the stocks traded on the New York Stock Exchange are listed in alphabetical order. Other tables provide information about stocks traded on other stock exchanges, such as the Nasdaq or the London Stock Exchange, in exactly the same way.

To understand how to read this table, focus on one company, such as the computer firm Hewlett-Packard, which was started in a garage by David Packard and William Hewlett in the 1930s. The information in the table pertains to a single day, February 28, 2007 (which was why the data were reported on March 1, the following day). According to the table, the price of Hewlett-Packard stock decreased by $0.45 cents to $38.93 on that day. Key terms introduced in this chapter—such as dividend yield and price-earnings ratio—are highlighted. To check your understanding, see if you can find out each of the critical pieces of information for one of the other firms in the table, such as Hershey, the maker of Hershey's Kisses.

The Financial Times also reports the prices of bonds, which, once they have been issued by a firm or by a government, are actively traded in bond markets. The next table reports information on government-issued bonds from the United Kingdom and the United States. Focus on the highlighted bond; it has a coupon rate of 4.75 percent and matures in February 2037. Thus, in February 2007, this newly issued bond has 30 years left to maturity. Sometimes bond price tables report the price that is bid for bonds by bond traders and the price that is asked for bonds by the traders. Only the bid price is given in this table, but the bid and ask are close to each other. (The difference is sufficient to give the traders some profit; note that the price asked by the trader is always greater than the price bid.)

Notice that the reported yield is different from the coupon rate for all the bonds listed. Also notice that this difference is especially pronounced for some of the U.K. bonds.

### Stock Price Table

<table>
<thead>
<tr>
<th>Hi</th>
<th>Lo</th>
<th>Stock</th>
<th>Yld (%)</th>
<th>PE</th>
<th>Vol 1,000s</th>
<th>Close</th>
<th>Net Chg</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.84</td>
<td>19.26</td>
<td>HealthMgmt</td>
<td>1.2</td>
<td>26.3</td>
<td>18,476</td>
<td>19.87</td>
<td>−0.09</td>
</tr>
<tr>
<td>47.69</td>
<td>37.35</td>
<td>Heinz</td>
<td>3.1</td>
<td>25.1</td>
<td>1,406</td>
<td>45.67</td>
<td>−0.20</td>
</tr>
<tr>
<td>57.00</td>
<td>49.34</td>
<td>Hershey</td>
<td>2.0</td>
<td>22.6</td>
<td>1,146</td>
<td>52.99</td>
<td>+.11</td>
</tr>
<tr>
<td>56.02</td>
<td>38.50</td>
<td>Hess Cp</td>
<td>0.8</td>
<td>8.7</td>
<td>2,378</td>
<td>53.19</td>
<td>+.14</td>
</tr>
<tr>
<td>43.53</td>
<td>29.79</td>
<td>Hew.-Pack</td>
<td>0.8</td>
<td>17.1</td>
<td>10,833</td>
<td>38.93</td>
<td>−0.45</td>
</tr>
<tr>
<td>37.53</td>
<td>23.00</td>
<td>HiltonHotl</td>
<td>0.5</td>
<td>25.4</td>
<td>2,900</td>
<td>34.90</td>
<td>−0.40</td>
</tr>
<tr>
<td>43.81</td>
<td>33.13</td>
<td>HomeDep</td>
<td>2.3</td>
<td>14.2</td>
<td>10,254</td>
<td>39.45</td>
<td>−0.15</td>
</tr>
</tbody>
</table>

### Bond Price Table

<table>
<thead>
<tr>
<th>Hi</th>
<th>Lo</th>
<th>Stock</th>
<th>Yld (%)</th>
<th>PE</th>
<th>Vol 1,000s</th>
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Notice that the reported yield is different from the coupon rate for all the bonds listed. Also notice that this difference is especially pronounced for some of the U.K. bonds.
The Trade-off between Risk and Return

One of the hallmarks of financial markets is volatility. The prices of individual stocks and bonds rise and fall over time. Over the long run, stock prices show a positive trend, but there are periods of significant decline from time to time, and the prices of individual stocks traded in the financial markets are volatile. Similarly, even though you always can earn a rate of return equivalent to the yield by holding a bond issued by the U.S. government to maturity, in the interim, the price of the bond will vary.

In the example discussed earlier, the price of a share of Hewlett-Packard increased by almost 42 percent in 2006, but in 2008, the price fell by 27.5 percent. Even the broad S&P 500 Index fell by 38.5 percent in 2008. Because of such variability, buying stocks is a risky activity. The price of bonds can change by a large amount. For example, from mid-1996 to mid-1997, the price of government bonds rose by nearly 20 percent, but from mid-1993 to mid-1994, the price of government bonds fell by nearly 20 percent. Thus, government bonds are also a risky investment.

In this section, we show that the riskiness of stocks and bonds affects the decision of people to trade in financial markets. To do so, we first examine how individuals behave when they face risk.

Behavior under Uncertainty

Most people do not like uncertainty. They are risk averse in most of their activities. Given a choice between two jobs that pay the same wage, most people will be averse to choosing the riskier job where there is a good chance of being laid off. Similarly, given a choice between two investments that pay the same return, people will choose the less risky one.

Let us examine this idea of risk aversion further. To be more precise, suppose that Melissa has a choice between the two alternatives shown in Table 16-2. She must decide
what to do with her life savings of $10,000 for the next year. At the end of the year, she plans to buy a house, and she will need some money for a down payment. She can put her $10,000 in a bank account, where the interest rate is 5 percent, or she can buy $10,000 worth of a stock that pays a dividend of 5 percent and will incur either a capital gain or a capital loss. In the bank, the value of her savings is safe, but if she buys the stock, she has a 50 percent chance that the price of the stock will fall by 30 percent and a 50 percent chance that the price of the stock will rise by 30 percent. In other words, the risky stock will leave Melissa with the possibility of a return of negative $2,500 (a loss) or a return of $3,500 (a gain). The bank account leaves her with a guaranteed $500 return.

Both of the options in Table 16-2 have the same expected return. The expected return on an investment weights the different gains or losses according to how probable they are. In the case of the safe bank account, there is a 100 percent chance that the return is $500, so the expected return is $500. In the case of the stock, the expected return would be negative $2,500 times the probability of this loss (1/2) plus $3,500 times the probability of this gain (also 1/2). Thus, the expected return is $500 \left(-\frac{2,500}{2} + \frac{3,500}{2}\right) = -1,250 + 1,750 = 500$, the same as the return on the bank account.

The expected return is one way to measure how attractive an investment is. The word expected may appear misleading, because in the risky option $500 is not “expected” in the everyday use of the word. You do not expect $500; you expect either a loss of $2,500 or a gain of $3,500. If the term is confusing, think of the expected return as the average return that Melissa would get if she could take the second option year after year for many years. The losses of $2,500 and gains of $3,500 would average out to $500 per year after many years. (The term expected return has been carried over by economists and investment analysts from probability and statistics, in which case the term expected value is used to describe the mean, or the average, of a random variable.)

Given that the expected returns are the same, if Melissa is a risk-averse person (that is, if she would dread a capital loss more than she would cherish a capital gain of a similar magnitude), she will choose the less risky of these two options. Although it is clear that Melissa would choose the less risky of the two options in Table 16-2, perhaps Melissa would accept some compensation to offset her risk aversion. Although most people are averse to risk, they are willing to take on some risk if they are compensated for it. In the case of a risky financial investment, the compensation for higher risk could take the form of a higher expected return.

How could we make Melissa’s expected return higher in the risky investment? Suppose Melissa had the choice between the same safe option as in Table 16-2 and a high-risk stock that paid a dividend of 20 percent. This new choice is shown in Table 16-3; the difference is that the risky stock now offers a dividend of 20 percent, much greater than the 5 percent in the first example and much greater than the 5 percent on the bank account. With the greater chance of a higher return on the stock, Melissa might be willing to buy the stock. Even in the worst situation, she loses just $1,000, which may still...
leave her with enough for the down payment on her new house. The expected return for the high-risk option is now $2,000, much greater than the $500 for the bank account (\(-1,000/2 + 5,000/2 = -500 + 2,500 = 2,000\)).

In other words, Melissa probably would be willing to take on the risky investment. And if the 20 percent dividend in the example is not enough for her, some higher dividend (25 percent? 30 percent?) would be. This example illustrates the general point that risk-averse people are willing to take risks if they are paid for it.

Before we develop the implication of our analysis of individual behavior under uncertainty, we should pause to ask about the possibility that some people might be risk lovers rather than risk avoiders. The billions of dollars that are bet in state lotteries in the United States and in private gambling casinos in Las Vegas, Atlantic City, and Monte Carlo indicate that some people enjoy risk. With few exceptions, however, most of the gambling on lotteries, slot machines, and even roulette wheels represents a small portion of the income or wealth of the gambler. Thus, you might be willing to spend $0.50 or even $5 on lottery tickets or a slot machine for the chance of winning big, even if the odds are against you. Many people get enjoyment out of such wagers; but if the stakes are large compared with one’s income or wealth, then few people want to play. For small sums, some people are risk lovers, but for large sums, virtually everybody becomes a risk avoider to some degree or another.

### Risk and Rates of Return in Theory

What are the implications of our conclusion that investors will be willing to take risks if they are compensated with a higher return on the stock or bond? In the stock market, the prices of individual stocks are determined by the bidding of buyers and sellers. Suppose a stock, AOK, had a price that gave it the same expected rate of return as a bank account. Now AOK, being a common stock, clearly has more risk than a bank account because its price can change. Hence, no risk-averse investor will want to buy AOK. Just as Melissa will prefer to put her funds in a bank account in the example in Table 16-2 rather than into the risky option, investors will put their funds in a bank rather than buy AOK. People who own shares of AOK will sell and put their funds into a bank. With everybody wanting to sell AOK and no one wanting to buy it, the price of AOK will start to fall.

<table>
<thead>
<tr>
<th>Low-Risk Option</th>
<th>High-Risk Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>A bank deposit with 5 percent interest (return = $500)</td>
<td>A corporate stock with either</td>
</tr>
<tr>
<td>a. A 20 percent dividend and a 30 percent price decline ($2,000 - $3,000 = -$1,000)</td>
<td></td>
</tr>
<tr>
<td>b. A 20 percent dividend and a 30 percent price increase ($2,000 + $3,000 = $5,000)</td>
<td></td>
</tr>
</tbody>
</table>

Table 16-3

Playing It Safe?
Most people are risk-averse when it comes to large sums, but many are risk lovers when the stakes are low or when they can limit their potential losses—such as at casinos where people can choose to gamble a set amount or combine gambling with entertainment.
Now, the price and the expected rate of return are inversely related—recall that for a stock, the rate of return is the return divided by the price. Thus, if the price falls and the dividend does not change, the rate of return will rise. This fall in the price will drive up the expected rate of return on AOK. As the expected rate of return increases, it eventually will reach a point at which it is high enough to compensate risk-averse investors. In other words, when the expected rate of return rises far enough above the bank account rate to compensate people for the risk, the price fall will stop. We will have an equilibrium at which point the expected rate of return on the stock is higher than the interest rate on the safe bank account. The higher rate of return will be associated with the higher risk.

Now some stocks are more risky than others. For example, the risk on the stocks of small firms tends to be higher than the risk on the stocks of larger firms, because small firms tend to be those that are just starting up. Not having yet proved themselves, small firms have a higher risk. People like Melissa will sell the more risky stocks of smaller companies until the expected rate of return on those stocks is high enough compared with the less risky stocks of larger companies.

In equilibrium, we therefore expect to see a positive relationship between risk and the expected rate of return on securities. Securities with higher risks will have higher returns than securities with lower risks. Figure 16-6 shows the resulting equilibrium risk-return relationship.

There is probably no more important lesson about capital markets than this relationship. Individual investors should know it well. It says that to get a higher rate of return on average over the long run, you have to accept a higher risk. Again, the market forces at work are the same as the ones that led to the compensating wage differentials in the labor market. In the

**Figure 16-6**

The Equilibrium Relationship between Return and Risk

More risky securities tend to have higher returns on average over the long term. For example, bank deposits are low risk and have a low expected return. Corporate stocks are higher risk—their price fluctuates—but on average over the long term have a higher return. The higher return is like a compensating wage differential in the labor market. It compensates those who take on more risk.
labor market, the higher wage in some jobs is the price that workers accept to take on the greater risk, or, more generally, the less pleasant aspects of the job.

Risk and Return in Reality

In reality, this theoretical relationship works very well. A tremendous amount of data over long periods of time on the financial markets support this relationship. The most widely cited evidence was compiled by Roger Ibbotson of Yale University who tabulated data, shown in Table 16-4, on the average return over many years for the four important types of securities we have mentioned in the theoretical discussion. The most risky of the four—the stocks of small firms—has the highest rate of return. The next highest in risk are the common stocks of large firms. The least risky—short-term U.S. Treasury bills that are as safe as bank deposits—has the smallest rate of return. Long-term bonds, for which price changes can be large, have a rate of return greater than that of U.S. Treasury bills. Although the relative risks of these four types of securities may seem obvious, a measure of the differences in the sizes of their price volatility is shown in the second column and confirms the intuitive risk rankings. In general, Table 16-4 is a striking confirmation of this fundamental result of financial markets that higher expected rates of return are associated with higher risk.

Diversification Reduces Risk

The familiar saying “Don’t put all your eggs in one basket” is particularly relevant to stock markets. Rather than a basket of eggs, you have a portfolio of stocks. A portfolio is a collection of stocks. Putting your funds into a portfolio of two or more stocks, whose prices do not always move in the same direction, rather than one stock is called portfolio diversification. The risks from holding a single stock can be reduced significantly by putting half your funds in one stock and half in another. If one stock falls in price, the other stock may fall less, may not fall at all, or may even rise.

Holding two stocks in equal amounts is the most elementary form of diversification. With thousands of stocks to choose from, however, diversification is not limited to two. Figure 16-7 shows how sharply risk declines with diversification. By holding ten different stocks rather than one, you can reduce your risk to about 30 percent of what it would be with one stock. If you hold some international stocks, whose behavior will be even more different from that of any one U.S. stock, you can reduce the risk even further. Mutual fund companies provide a way for an investor with only limited funds to diversify by holding 500 or even 5,000 stocks along with other investors. Some mutual funds—called index funds—consist of all the stocks in an index like the S&P 500 Index.
Efficient Market Theory

The shares of firms’ stock on the market can be traded quickly at any time of day. For most large and medium-size companies, some people are always willing to buy and sell. If people hear that Intel has made a discovery that is expected to raise its profits, they rush to buy Intel stock. If people suddenly learn about a decline in a company’s profits or about losses, then people rush to sell that company’s stock. This rush to buy and sell changes prices instantaneously, so that the price adjusts rapidly to good news or bad news. The rapid adjustment means that unexploited profit opportunities are rare for regular investors without inside information or a special ability to anticipate news, whether good or bad. The efficient market hypothesis states that profit opportunities are eliminated in financial markets as stock prices adjust quickly to new information. Rates of return greater than those resulting from the price of risk disappear soon after any good news about a stock appears.

Many tests over the years have found the efficient market hypothesis to be a close approximation of security price determination. It has led to the growth in popularity of index funds, for which investors do not pay advisers to tell them when to buy and sell stock. They simply invest in a fund that includes a large number of stocks.
Corporate Governance Problems

When corporations issue stock to buy physical capital or to start up operations, a separation between the owners of the corporation—the stockholders—and the managers of the corporation is created. This separation leads to incentive problems—the manager might not act in the interest of the shareholder. Here we show how these problems can be analyzed with a theory called asymmetric information theory.

Asymmetric Information: Moral Hazard and Adverse Selection

Consider a start-up firm. When an entrepreneur at a start-up firm obtains financial capital by issuing stock, a special relationship is formed. Those who supplied the financial capital by buying the stock become owners or at least part owners of the company. If the entrepreneur does well and the company is successful, they reap large returns. But shareholders of a firm have less information than the managers about the firm. This difference in information, called asymmetric information, can cause several problems. First, the manager might not act in the interest of the owners. Taking unnecessary business trips on the company’s aircraft to exotic places or not working hard to find the right employees is harmful to the shareholders’ interests. This is sometimes called moral hazard, a term borrowed from research on the insurance industry, for which asymmetric information is also a problem. Moral hazard in insurance occurs when people are less careful about trying to prevent fires after they get fire insurance. In the case of the firm, the manager may be less careful about the firm after the shareholders’ funds have been obtained.

Another problem is that those entrepreneurs who have more risky projects would seek equity financing—for which dividend payments to shareholders would be optional—rather than debt financing, for which interest payments are required. This is called adverse selection, yet another term borrowed from insurance. In insurance, adverse selection occurs, for example, when people who are unhealthy select health insurance while healthy people do not. In this case, managers who have more risky projects elect equity financing more often than those who have less risky projects. This makes potential shareholders or investors less willing to supply funds to equity markets.

Incentives to Overcome Adverse Selection and Moral Hazard Problems

One way in which problems of moral hazard and adverse selection can be limited is through the use of profit-sharing agreements, whereby managers are given a share of the profits earned by the firm. That way, the managers of the firms have a financial stake in the

- Investors can reduce risk by diversifying their portfolio, that is, by holding many different stocks. Mutual funds and index funds offer diversification opportunities even to investors who have little money to put into the stock market.
- Earning stock returns in excess of those justified by the greater level of associated risk is difficult. The efficient market hypothesis predicts that stock prices adjust quickly to eliminate such lucrative return opportunities.

individual who is risk averse always will choose the safe asset.

- Risk-averse investors will hold risky assets only if they are compensated in the form of a higher expected return. Thus, when buyers and sellers trade stocks or bonds in the market, a relationship between return and risk emerges: Higher risk is associated with higher returns.

- asymmetric information different levels of information available to different people in an economic interaction or exchange.
- moral hazard in insurance markets, a situation in which a person buys insurance against some risk and subsequently takes actions that increase the risk; analogous situations arise when other markets have asymmetric information.
- adverse selection in insurance markets, a situation in which the people who choose to buy insurance will be the riskiest group in the population; analogous situations apply in other markets.
- profit sharing programs in which managers and employees receive a share of profits earned by the firm.