

PAYOUT POLICY AND CAPITAL STRUCTURE

Payout Policy

► **Corporations can return** cash to their shareholders by paying a dividend or by repurchasing shares. In this chapter we explain how financial managers decide on the amount and form of payout, and we discuss the controversial question of how payout policy affects shareholder value.

Suppose you own stock in a corporation that has \$1 per share of unneeded cash. It can hold on to the cash or it can pay an extra cash dividend of \$1 per share. Does the decision matter? Your first instinct should be to say no. The dividend puts \$1 per share in your pocket but, at the same time, each share should be worth \$1 less. Your wealth should be unaffected.

But corporations usually hold cash for a reason. What if that \$1 per share is not redundant money? Suppose that it was set aside for capital investment. Then paying the extra dividend could mean cancelation of investment projects. The payout decision could also be an investment decision.

Suppose the firm pays out \$1 per share, but replaces the cash by borrowing. Then the payout decision would also be a borrowing decision.

To fully understand payout policy, we must separate payout decisions from investment and borrowing decisions. If we hold investment and borrowing fixed, changes in cash dividends must be offset by issues or retirements of shares. For example, a company might pay generous cash dividends, knowing that it will have to schedule stock issues to raise cash for investment. Another company might pay no dividends, but instead use cash to repurchase shares.

Therefore we will take care to analyze the trade-off between higher or lower cash dividends and the issue or repurchase of common stock. The trade-off is more interesting than you might at first think, for at least three reasons. First, changes in dividends convey information about the firm's profitability to investors. Second, dividends are taxed at higher rates than capital gains. Third, investors worry that cash-cow corporations will run out of positive-NPV investments and waste cash on perks or poor projects. Generous cash payouts are one way of relieving such worries.

We start the chapter with facts about payout and a description of how dividends and repurchases happen.

16-1 Facts about Payout

Corporations can pay out cash to their shareholders in two ways. They can pay a dividend or they can buy back some of the outstanding shares. In recent years dividend payments and stock repurchases have amounted to a high proportion of earnings.

Although dividends remain the principal channel for returning cash to shareholders, many corporations pay no dividends at all. In the U.S., the percentage of dividend-paying

FIGURE 16.1

Dividends and stock repurchases in the United States, 1980–2008 (figures in \$ billions).

Source: Standard & Poor's Compustat.



firms fell from 64% in 1980 to 52% in 2007.¹ Some of the non-dividend payers did pay a dividend in the past but then fell on hard times and were forced to conserve cash. Further, a large number of new growth companies have gone public in recent years and do not pay a dividend. In the U.S. these include such household names as Sun Microsystems, Cisco, Amazon, and Google, as well as many small, rapidly growing firms that have not yet reached full profitability.

Figure 16.1 shows that before 1983 stock repurchases were fairly rare, but since then they have become increasingly common. In 2007, a record year for stock repurchases, 28 U.S. companies each bought back more than \$5 billion of stock. Exxon Mobil bought back \$31 billion, Microsoft bought back \$28 billion, IBM \$19 billion, and GE \$14 billion.

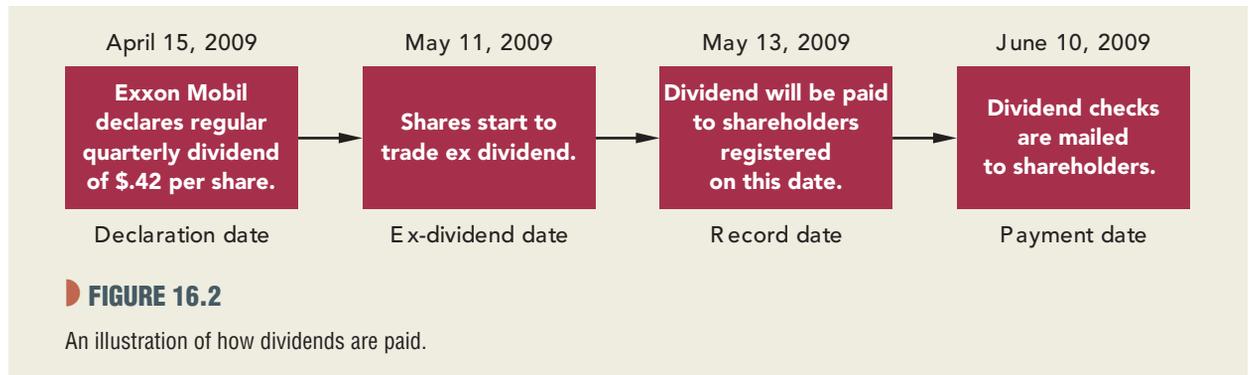
16-2 How Firms Pay Dividends and Repurchase Stock

Before we look at the choice between dividends and stock repurchases, we need to review how these payments to shareholders take place.

A company's dividend is set by the board of directors. The announcement of the dividend states that the payment will be made to all stockholders who are registered on a particular *record date*. Then a week or so later dividend checks are mailed to stockholders. Stocks are normally bought or sold *with dividend* (or *cum dividend*) until two business days before the record date, and then they trade *ex dividend*. If you buy stock on the ex-dividend date, your purchase will not be entered on the company's books before the record date and you will not be entitled to the dividend.

Figure 16.2 illustrates this sequence of events. On April 15, 2009, Exxon Mobil declared a quarterly dividend of \$.42 per share. The dividend was paid on June 10 to all shareholders who were registered on the company's books on May 13. Two days earlier on May 11 the shares began to trade ex dividend. Any investor who bought shares on that date would not have had his purchase registered by the record date and would not have been entitled to the dividend.

¹ The proportion of dividend payers among U.S. industrial companies is even lower. See E. Fama and K. French, "Disappearing Dividends: Changing Firm Characteristics or Lower Propensity to Pay?" *Journal of Financial Economics* 60 (2001), pp. 3–43. In Europe the decline in the proportion of dividend payers has been particularly marked in Germany. See D. J. Denis and I. Osobov, "Why Do Firms Pay Dividends? International Evidence on the Determinants of Dividend Policy," *Journal of Financial Economics* 89 (July 2008), pp. 62–82.



The company is not free to declare whatever dividend it chooses. In some countries, such as Brazil and Chile, companies are obliged by law to pay out a *minimum* proportion of their earnings. Conversely, some restrictions may be imposed by lenders, who are concerned that excessive dividend payments would not leave enough in the kitty to repay their loans. In the U.S., state law also helps to protect the firm's creditors against excessive dividend payments. For example, companies are not allowed to pay a dividend out of legal capital, which is generally defined as the par value of outstanding shares.²

Most U.S. companies pay a *regular* cash dividend each quarter, but occasionally this is supplemented by a one-off *extra* or *special dividend*. Many companies offer shareholders automatic dividend reinvestment plans (DRIPs). Often the new shares are issued at a 5% discount from the market price. Sometimes 10% or more of total dividends will be reinvested under such plans.³

Dividends are not always in the form of cash. Frequently companies also declare *stock dividends*. For example, if the firm pays a stock dividend of 5%, it sends each shareholder 5 extra shares for every 100 shares currently owned. A stock dividend is essentially the same as a stock split. Both increase the number of shares but do not affect the company's assets, profits, or total value. So both reduce value *per share*.⁴ In this chapter we focus on *cash* dividends.

How Firms Repurchase Stock

Instead of paying a dividend to its stockholders, the firm can use the cash to repurchase stock. The reacquired shares are kept in the company's treasury and may be resold if the company needs money. There are four main ways to repurchase stock. By far the most common method is for the firm to announce that it plans to buy its stock in the open market, just like any other investor.⁵ However, companies sometimes use a tender offer where they offer to buy back a stated number of shares at a fixed price, which is typically set at about 20% above the current market level. Shareholders can then choose whether to accept this offer. A third procedure is to employ a *Dutch auction*. In this case the firm states a series of

² Where there is no par value, legal capital is defined as part or all of the receipts from the issue of shares. Companies with wasting assets, such as mining companies, are sometimes permitted to pay out legal capital.

³ Sometimes companies not only allow shareholders to reinvest dividends but also allow them to buy additional shares at a discount. For an amusing and true rags-to-riches story, see M. S. Scholes and M. A. Wolfson, "Decentralized Investment Banking: The Case of Dividend-Reinvestment and Stock-Purchase Plans," *Journal of Financial Economics* 24 (September 1989), pp. 7-36.

⁴ The distinction between a stock dividend and a stock split is technical. A stock dividend is shown in the accounts as a transfer from retained earnings to equity capital. A split is shown as a reduction in the par value of each share.

⁵ The U.S. Securities and Exchange Commission's rule 10b-18 protects repurchasing firms from accusations of share-price manipulation. Adoption of this rule was one reason why repurchases have grown so rapidly. Open-market repurchases are subject to several restrictions, however. For example, repurchases cannot exceed a small fraction of daily trading volume.

prices at which it is prepared to repurchase stock. Shareholders submit offers declaring how many shares they wish to sell at each price and the company calculates the lowest price at which it can buy the desired number of shares.⁶ Finally, repurchase sometimes takes place by direct negotiation with a major shareholder.

16-3 How Do Companies Decide on Payouts?

In 2004 a survey of senior executives asked about their firms' dividend policies.⁷ Figure 16.3 paraphrases the executives' responses. Three features stand out:

1. Managers are reluctant to make dividend changes that may have to be reversed. They are particularly worried about having to rescind a dividend increase and, if necessary, would choose to raise new funds to maintain the payout.
2. To avoid the risk of a reduction in payout, managers "smooth" dividends. Consequently, dividend changes follow shifts in long-run sustainable earnings. Transitory earnings changes are unlikely to affect dividend payouts.
3. Managers focus more on dividend changes than on absolute levels. Thus paying a \$2.00 dividend is an important financial decision if last year's dividend was \$1.00, but no big deal if last year's dividend was \$2.00.

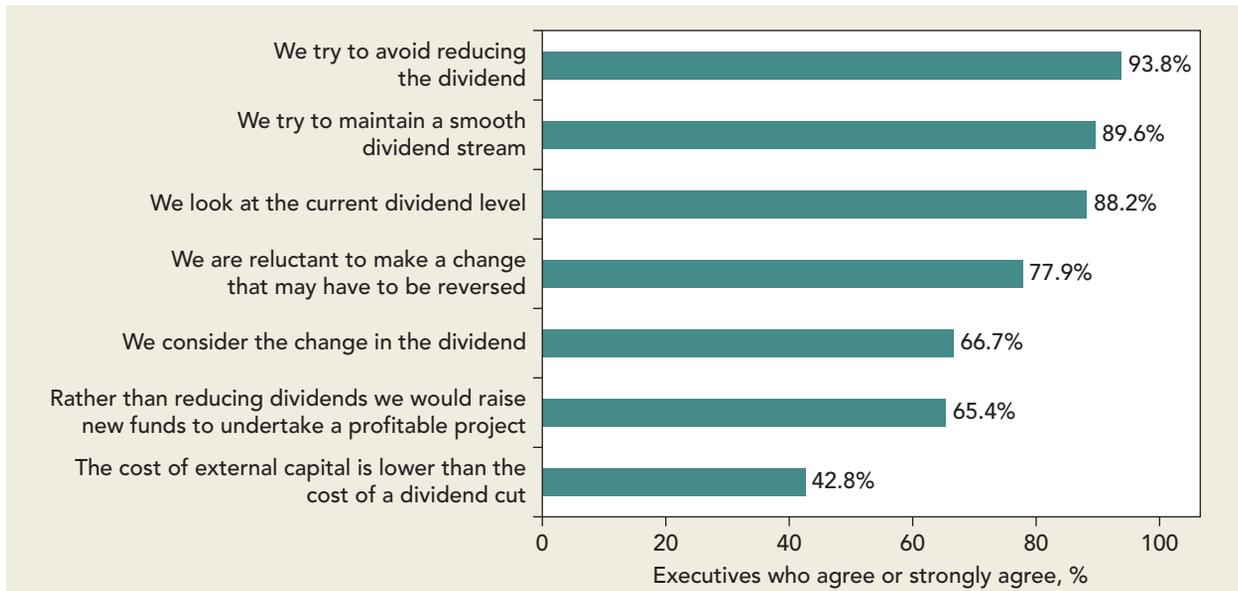


FIGURE 16.3

A 2004 survey of financial executives suggested that their firms were reluctant to cut the dividend and tried to maintain a smooth series of payments.

Source: A. Brav, J. R. Graham, C. R. Harvey, and R. Michaely, "Payout Policy in the 21st Century," *Journal of Financial Economics* 77 (September 2005), pp. 483–527. © 2005 Elsevier Science, used with permission.

⁶ This is another example of the uniform-price auction described in Section 15.3.

⁷ See A. Brav, J. R. Graham, C. R. Harvey, and R. Michaely, "Payout Policy in the 21st Century," *Journal of Financial Economics* 77 (September 2005), pp. 483–527. This paper revisits an earlier classic series of interviews on dividend policy described in J. Lintner, "Distribution of Incomes of Corporations among Dividends, Retained Earnings, and Taxes," *American Economic Review* 46 (May 1956), pp. 97–113.

While stock repurchases are like bumper dividends, they do not typically *substitute* for dividends. Over two-thirds of the companies that paid a dividend in 2007 also repurchased stock. Firms are likely to buy back stock when they have accumulated a large amount of unwanted cash or wish to change their capital structure by replacing equity with debt.

Unlike a stock repurchase, dividends are not regarded as an appropriate way to pay out transitory earnings. Therefore, many firms that repurchase stock would not contemplate using the cash to raise the dividend and so incur a commitment to maintain the payout.⁸

Given these differences in the way that dividends and repurchases are used, it is not surprising to find that repurchases are much more volatile than dividends. Repurchases generally mushroom during boom times as firms accumulate excess cash but wither in recessions. You can see this from Figure 16.1, which shows that repurchases fell sharply during the early 1990s and then again between 2000 and 2002. In 2008, as the depth of the financial crisis became clear, repurchases were again cut back sharply. (Even Exxon Mobil, the all-time repurchase champion, announced in May 2009 that it was cutting back repurchases to \$5 billion per quarter, down from \$8 billion per quarter a year earlier.) Dividends were also reduced, but not by nearly as much.

Until recently many countries banned or severely restricted the use of stock repurchases. As a result, firms that had amassed large amounts of cash were tempted to invest it at very low rates of return rather than hand it back to shareholders, who could have reinvested it in firms that were short of cash. But many of these limitations have now been removed. For example, Japan permitted repurchases in 1995 and Sweden in 2000, while Germany relaxed its restrictions in 1998.⁹ Many multinational giants now repurchase huge amounts of stock. For example, in 2007 the Spanish bank BBVA, BP, Royal Dutch Shell, and Glaxo Smith Kline all spent huge sums on buying back their stock.

16-4 The Information in Dividends and Stock Repurchases

In some countries you cannot rely on the information that companies provide. Passion for secrecy and a tendency to construct multilayered corporate organizations produce asset and earnings figures that are next to meaningless. Some people say that, thanks to creative accounting, the situation is little better for some companies in the U.S.

How does an investor in such a world separate marginally profitable firms from the real money makers? One clue is dividends. Investors can't read managers' minds, but they can learn from managers' actions. They know that a firm that reports good earnings and pays a generous dividend is putting its money where its mouth is. We can understand, therefore, why investors would value the *information content of dividends* and would refuse to believe a firm's reported earnings unless they were backed up by an appropriate dividend policy.

Of course, firms can cheat in the short run by overstating earnings and scraping up cash to pay a generous dividend. But it is hard to cheat in the long run, for a firm that is not making enough money will not have enough cash to pay out. If a firm chooses a high dividend payout without the cash flow to back it up, that firm will ultimately have to reduce its investment plans or turn to investors for additional debt or equity financing. All of these consequences are costly. Therefore, most managers don't increase dividends until they are confident that sufficient cash will flow in to pay them.

⁸ See, for example, R. Dittmar and A. Dittmar, "Stock Repurchase Waves: An Examination of the Trends in Aggregate Corporate Payout Policy," working paper, University of Michigan at Ann Arbor, February 2004.

⁹ For a survey of repurchase practices in different countries, see International Organization of Securities Commissions (IOSCO), "Report on Stock Repurchase Programs," February 2004, www.iosco.org.

Do dividend changes convey information about future as well as current profitability? The evidence is mixed. Several researchers find that dividend increases do not predict increased earnings growth. However, Healy and Palepu, who focus on companies that paid a dividend for the first time, find that on average earnings jumped 43% in the year a dividend was paid. If managers thought that this was a temporary windfall, they might have been cautious about committing themselves to paying out cash. But it looks as if these managers had good reason to be confident about prospects, for earnings continued to rise in the following years.¹⁰

Investors certainly appear to take comfort from an increase in dividends. When the increase is announced, analysts generally up their forecast of the current year's earnings.¹¹ It is no surprise, therefore, to find that a higher dividend prompts a rise in the stock price, whereas a dividend cut results in a fall in price. For example, in the case of the dividend initiations studied by Healy and Palepu, the dividend announcement resulted in a 4% stock-price increase on average.¹²

Notice that investors do not get excited about the *level* of a company's dividend; they worry about the *change*, which they view as an important indicator of the sustainability of earnings.

It seems that in some other countries investors are less preoccupied with dividend changes. For example, in Japan there is a much closer relationship between corporations and major stockholders, and therefore information may be more easily shared with investors. Consequently, Japanese corporations are more prone to cut their dividends when there is a drop in earnings, but investors do not mark the stocks down as sharply as in the U.S.¹³

Do not assume that all dividend cuts are bad news, however. The nearby box explains how investors endorsed a drastic dividend cut announced in 2009 by J.P. Morgan.

The Information Content of Share Repurchases

Share repurchases, like dividends, are a way to hand cash back to shareholders. But unlike dividends, share repurchases are frequently a one-off event. So a company that announces a repurchase program is not making a long-term commitment to distribute more cash. The information in the announcement of a share repurchase program is therefore different from the information in a dividend payment.

Corporations repurchase shares when they have accumulated excess cash or when they want to substitute debt for equity. Shareholders applaud payout of excess cash when they worry that the firm would otherwise fritter the money away on perks or unprofitable empire building. Shareholders also know that firms with large quantities of debt to service are less likely to squander cash. A study by Comment and Jarrell, who looked at the announcements of open-market repurchase programs, found that on average they resulted in an abnormal price rise of 2%.¹⁴

¹⁰ P. Healy and K. Palepu, "Earnings Information Conveyed by Dividend Initiations and Omissions," *Journal of Financial Economics* 21 (1988), pp. 149–175. For an example of a study that finds no information in dividend changes, see G. Grullon, R. Michaely, and B. Swaminathan, "Are Dividend Changes a Sign of Firm Maturity?" *Journal of Business* 75 (July 2002), pp. 387–424.

¹¹ A. R. Ofer and D. R. Siegel, "Corporate Financial Policy, Information, and Market Expectations: An Empirical Investigation of Dividends," *Journal of Finance* 42 (September 1987), pp. 889–911.

¹² The 4% average return was adjusted for market returns. Healy and Palepu also looked at companies that *stopped* paying a dividend. In this case the stock price on average declined by 9.5% on the announcement and earnings fell over the next four quarters.

¹³ The dividend policies of Japanese *keiretsus* are analyzed in K. L. Dewenter and V. A. Warther, "Dividends, Asymmetric Information, and Agency Conflicts: Evidence from a Comparison of the Dividend Policies of Japanese and U.S. Firms," *Journal of Finance* 53 (June 1998), pp. 879–904.

¹⁴ R. Comment and G. Jarrell, "The Relative Signalling Power of Dutch-Auction and Fixed Price Self-Tender Offers and Open-Market Share Repurchases," *Journal of Finance* 46 (September 1991), pp. 1243–1271. There is also evidence of continuing superior performance during the years following a repurchase announcement. See D. Ikenberry, J. Lakonishok, and T. Vermaelen, "Market Underreaction to Open Market Share Repurchases," *Journal of Financial Economics* 39 (October 1995), pp. 181–208.

Good News: J.P. Morgan Cuts Its Dividend to a Nickel

On February 23, 2009, J.P. Morgan cut its quarterly dividend from 38¢ to a nickel (5¢) per share. The cut was a surprise to investors, but the bank's share price *increased* by about 5%.

Usually dividend cuts or omissions are bad news, because investors infer trouble. Investors take the cut as a signal of a cash or earnings shortfall—and they are usually right. Managers know that cuts will be treated as bad news, so they usually put off cuts until enough bad news accumulates to force them to act. For example, General Motors, which lost \$39 billion in 2007 and \$31 billion in 2008, continued paying quarterly dividends of 25¢ per share until June 2008, when it cut its dividend to zero.

J.P. Morgan Chase, however, acted from a position of relative strength. It remained profitable when

other large U.S. banks were announcing horrific losses. Its CEO James Dimon explained that the dividend cut would save \$5 billion a year and prepare it for a worst-case recession. It would also “put the bank in a position to pay back more quickly the \$25 billion that it took from the government under the Troubled Asset Relief Program.” J.P. Morgan has said it was encouraged to take the money and didn't need it.

Thus investors interpreted the dividend cut as a signal of confidence, not of distress.

Source: R. Sidel and M. Rieker, “J.P. Morgan Makes 87% Cut in its Dividend to a Nickel,” *The New York Times*, February 24, 2009, pp. C1, C3.

Stock repurchases may also be used to signal a manager's confidence in the future. Suppose that you, the manager, believe that your stock is substantially undervalued. You announce that the company is prepared to buy back a fifth of its stock at a price that is 20% above the current market price. But (you say) you are certainly not going to sell any of your own stock at that price. Investors jump to the obvious conclusion—you must believe that the stock is a good value even at 20% above the current price.

When companies offer to repurchase their stock at a premium, senior management and directors usually commit to hold on to their stock.¹⁵ So it is not surprising that researchers have found that announcements of offers to buy back shares above the market price have prompted a larger rise in the stock price, averaging about 11%.¹⁶

16-5 The Payout Controversy

We have seen that a change in payout may provide information about management's confidence in the future and so affect the stock price. But eventually this change in the stock price would happen anyway as information seeps out through other channels. But does payout policy change the value of the firm's common stock, rather than just sending a signal about value?

One endearing feature of economics is its ability to accommodate not just two, but three, opposing points of view. And so it is with payout policy. On the right, a conservative

¹⁵ Not only do managers hold on to their stock; on average they also add to their holdings *before* the announcement of a repurchase. See D. S. Lee, W. Mikkelsen, and M. M. Parth, “Managers' Trading around Stock Repurchases,” *Journal of Finance* 47 (December 1992), pp. 1947–1961.

¹⁶ See R. Comment and G. Jarrell, *op. cit.*

group argues that investors prefer higher dividend payouts. On the left, another group argues that higher dividends decrease value, because dividends are taxed more heavily than capital gains. And in the center, there is a middle-of-the-road party that claims that payout policy makes no difference.

Dividend Policy Is Irrelevant in Perfect Capital Markets

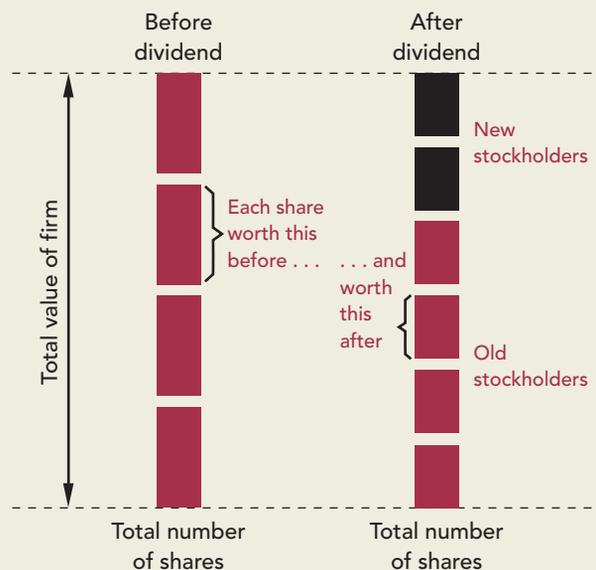
The middle-of-the-road party was founded in 1961 by Miller and Modigliani (always referred to as “MM”), when they published a proof that dividend policy is irrelevant in a world without taxes, transaction costs, or other market imperfections.¹⁷ MM argued as follows. Suppose your firm has settled on its investment program. You have a plan to finance the investments with cash on hand, additional borrowing, and reinvestment of future earnings. Any surplus cash is to be paid out as dividends.

Now think what happens if you want to increase the total payout by upping the dividend without also changing the investment and financing policy. The extra money must come from somewhere. If the firm fixes its borrowing, the only way it can finance the extra dividend is to print some more shares and sell them. The new stockholders are going to part with their money only if you can offer them shares that are worth as much as they cost. But how can the firm sell more shares when its assets, earnings, investment opportunities, and, therefore, market value are all unchanged? The answer is that there must be a *transfer of value* from the old to the new stockholders. The new ones get the newly printed shares, each one worth less than before the dividend change was announced, and the old ones suffer a capital loss on their shares. The capital loss borne by the old shareholders just offsets the extra cash dividend they receive.

Figure 16.4 shows how this transfer of value occurs. Our hypothetical company pays out a third of its total value as a dividend and it raises the money to do so by selling new shares.

FIGURE 16.4

This firm pays out a third of its worth as a dividend and raises the money by selling new shares. The transfer of value to the new stockholders is equal to the dividend payment. The total value of the firm is unaffected.



¹⁷ M. H. Miller and F. Modigliani, “Dividend Policy, Growth and the Valuation of Shares,” *Journal of Business* 34 (October 1961), pp. 411–433. MM’s arguments were anticipated in 1938 in J. B. Williams, *The Theory of Investment Value* (Cambridge, MA: Harvard University Press, 1938). Also, a proof similar to MM’s was developed in J. Lintner, “Dividends, Earnings, Leverage and Stock Prices and the Supply of Capital to Corporations,” *Review of Economics and Statistics* 44 (August 1962), pp. 243–269.

The capital loss suffered by the old stockholders is represented by the reduction in the size of the red boxes. But that capital loss is exactly offset by the fact that the new money raised (the black boxes) is paid over to them as dividends.

Does it make any difference to the old stockholders that they receive an extra dividend payment plus an offsetting capital loss? It might if that were the only way they could get their hands on cash. But as long as there are efficient capital markets, they can raise the cash by selling shares. Thus the old shareholders can cash in either by persuading the management to pay a higher dividend or by selling some of their shares. In either case there will be a transfer of value from old to new shareholders. The only difference is that in the former case this transfer is caused by a dilution in the value of each of the firm's shares, and in the latter case it is caused by a reduction in the number of shares held by the old shareholders. The two alternatives are compared in Figure 16.5.

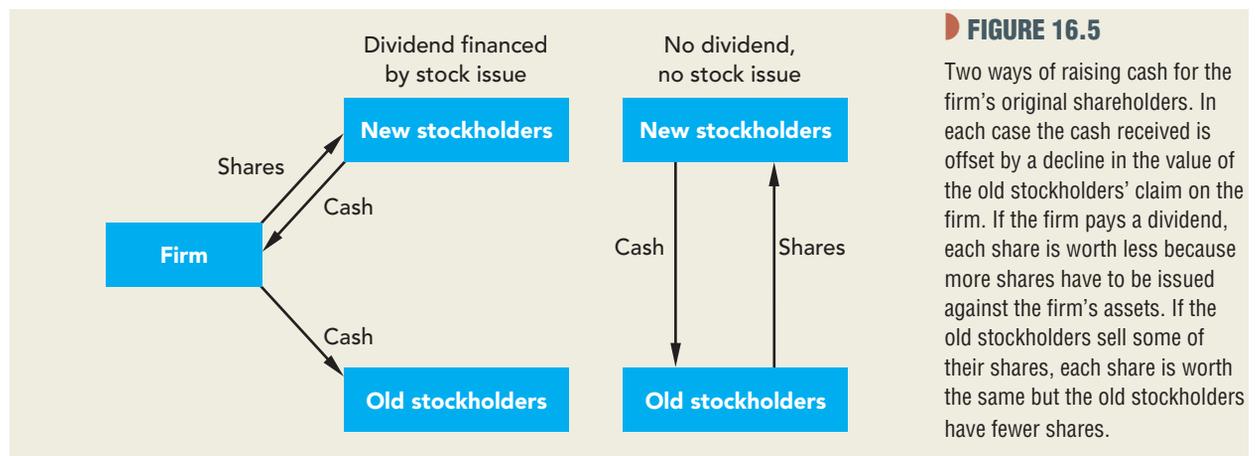
Because investors do not need dividends to get their hands on cash, they will not pay higher prices for the shares of firms with high payouts. Therefore firms ought not to worry about dividend policy. They can let dividends fluctuate as a by-product of their investment and financing decisions.

Dividend Irrelevance—An Illustration

Consider the case of Rational Demiconductor, which at this moment has the following balance sheet:

Cash (\$1,000 held for investment)	1,000	0	Debt
Fixed assets	9,000	10,000 + NPV	Equity
Investment opportunity (\$1,000 investment required)	NPV		
Total asset value	\$10,000 + NPV	\$10,000 + NPV	Value of firm

Rational Demiconductor has \$1,000 cash earmarked for a project requiring a \$1,000 investment. We do not know how attractive the project is, and so we enter it at NPV; after the project is undertaken it will be worth \$1,000 + NPV. Note that the balance sheet is



constructed with market values; equity equals the market value of the firm's outstanding shares (price per share times number of shares outstanding). It is not necessarily equal to their book value.

Now Rational Demiconductor uses the cash to pay a \$1,000 dividend to its stockholders. The benefit to them is obvious: \$1,000 of spendable cash. It is also obvious that there must be a cost. The cash is not free.

Where does the money for the dividend come from? Of course, the immediate source of funds is Rational Demiconductor's cash account. But this cash was earmarked for the investment project. Since we want to isolate the effects of dividend policy on shareholders' wealth, we assume that the company *continues* with the investment project. That means that \$1,000 in cash must be raised by new financing. This could consist of an issue of either debt or stock. Again, we just want to look at dividend policy for now, and we defer discussion of the debt-equity choice until Chapters 17 and 18. Thus Rational Demiconductor ends up financing the dividend with a \$1,000 stock issue.

Now we examine the balance sheet after the dividend is paid, the new stock is sold, and the investment is undertaken. Because Rational Demiconductor's investment and borrowing policies are unaffected by the dividend payment, its *overall* market value must be unchanged at $\$10,000 + \text{NPV}$.¹⁸ We know also that if the new stockholders pay a fair price, their stock is worth \$1,000. That leaves us with only one missing number—the value of the stock held by the original stockholders. It is easy to see that this must be

$$\begin{aligned}\text{Value of original stockholders' shares} &= \text{value of company} - \text{value of new shares} \\ &= (\$10,000 + \text{NPV}) - \$1,000 \\ &= \$9,000 + \text{NPV}\end{aligned}$$

The old shareholders have received a \$1,000 cash dividend and incurred a \$1,000 capital loss. Dividend policy doesn't matter.

By paying out \$1,000 with one hand and taking it back with the other, Rational Demiconductor is recycling cash. To suggest that this makes shareholders better off is like advising a cook to cool the kitchen by leaving the refrigerator door open.

Of course, our proof ignores taxes, issue costs, and a variety of other complications. We turn to those items in a moment. The really crucial assumption in our proof is that the new shares are sold at a fair price. The shares sold to raise \$1,000 must actually be *worth* \$1,000.¹⁹ In other words, we have assumed efficient capital markets.

Calculating Share Price

We have assumed that Rational Demiconductor's new shares can be sold at a fair price, but what is that price and how many new shares are issued?

Suppose that before this dividend payout the company had 1,000 shares outstanding and that the project had an NPV of \$2,000. Then the old stock was worth in total $\$10,000 + \text{NPV} = \$12,000$, which works out at $\$12,000/1,000 = \12 per share. After the company has paid the dividend and completed the financing, this old stock is worth $\$9,000 + \text{NPV} = \$11,000$. That works out at $\$11,000/1,000 = \11 per share. In other words, the price of the old stock falls by the amount of the \$1 per share dividend payment.

Now let us look at the new stock. Clearly, after the issue this must sell at the same price as the rest of the stock. In other words, it must be valued at \$11. If the new stockholders

¹⁸ All other factors that might affect Rational Demiconductor's value are assumed constant. This is not a necessary assumption, but it simplifies the proof of MM's theory.

¹⁹ The "old" shareholders get all the benefit of the positive-NPV project. The new shareholders require only a fair rate of return. They are making a zero-NPV investment.

get fair value, the company must issue $\$1,000/\11 or 91 new shares in order to raise the $\$1,000$ that it needs.

Stock Repurchase

We have seen that any increased cash dividend payment must be offset by a stock issue if the firm's investment and borrowing policies are held constant. In effect the stockholders finance the extra dividend by selling off part of their ownership of the firm. Consequently, the stock price falls by just enough to offset the extra dividend.

This process can also be run backward. With investment and borrowing policy given, any *reduction* in dividends must be balanced by a reduction in the number of shares issued or by repurchase of previously outstanding stock. But if the process has no effect on stockholders' wealth when run forward, it must likewise have no effect when run in reverse. We will confirm this by another numerical example.

Suppose that a technical discovery reveals that Rational Demiconductor's new project is not a positive-NPV venture but a sure loser. Management announces that the project is to be discarded and that the $\$1,000$ earmarked for it will be paid out as an extra dividend of $\$1$ per share. After the dividend payout, the balance sheet is

Cash	\$ 0	\$ 0	Debt
Existing fixed assets	9,000	9,000	Equity
New project	0		
Total asset value	\$ 9,000	\$ 9,000	Total firm value

Since there are 1,000 shares outstanding, the stock price is $\$10,000/1,000 = \10 before the dividend payment and $\$9,000/1,000 = \9 after the payment.

What if Rational Demiconductor uses the $\$1,000$ to repurchase stock instead? As long as the company pays a fair price for the stock, the $\$1,000$ buys $\$1,000/\$10 = 100$ shares. That leaves 900 shares worth $900 \times \$10 = \$9,000$.

As expected, we find that switching from cash dividends to share repurchase has no effect on shareholders' wealth. They forgo a $\$1$ cash dividend but end up holding shares worth $\$10$ instead of $\$9$.

Note that when shares are repurchased the transfer of value is in favor of those stockholders who do not sell. They forgo any cash dividend but end up owning a larger slice of the firm. In effect they are using their share of Rational Demiconductor's $\$1,000$ distribution to buy out some of their fellow shareholders.

Stock Repurchase and Valuation

Valuing the equity of a firm that repurchases its own stock can be confusing. Let's work through a simple example.

Company X has 100 shares outstanding. It earns $\$1,000$ a year, all of which is paid out as a dividend. The dividend per share is, therefore, $\$1,000/100 = \10 . Suppose that investors expect the dividend to be maintained indefinitely and that they require a return of 10%. In this case the value of each share is $PV_{\text{share}} = \$10/.10 = \100 . Since there are 100 shares outstanding, the *total* market value of the equity is $PV_{\text{equity}} = 100 \times \$100 = \$10,000$. Note that we could reach the same conclusion by discounting the *total* dividend payments to shareholders ($PV_{\text{equity}} = \$1,000/.10 = \$10,000$).²⁰

²⁰ When valuing the entire equity, remember that if the company is expected to issue additional shares in the future, we should include the dividend payments on these shares only if we also include the amount that investors pay for them. See Chapter 19.

Now suppose the company announces that instead of paying a cash dividend in year 1, it will spend the same money repurchasing its shares in the open market. The total expected cash flows to shareholders (dividends and cash from stock repurchase) are unchanged at \$1,000. So the total value of the equity also remains at $\$1,000/.10 = \$10,000$. This is made up of the value of the \$1,000 received from the stock repurchase in year 1 ($PV_{\text{repurchase}} = \$1,000/1.1 = \$909.1$) and the value of the \$1,000-a-year dividend starting in year 2 [$PV_{\text{dividends}} = \$1,000/ (.10 \times 1.1) = \$9,091$]. Each share continues to be worth $\$10,000/100 = \100 just as before.

Think now about those shareholders who plan to sell their stock back to the company. They will demand a 10% return on their investment. So the expected price at which the firm buys back shares must be 10% higher than today's price, or \$110. The company spends \$1,000 buying back its stock, which is sufficient to buy $\$1,000/\$110 = 9.09$ shares.

The company starts with 100 shares, it buys back 9.09, and therefore 90.91 shares remain outstanding. Each of these shares can look forward to a dividend stream of $\$1,000/90.91 = \11 per share. So after the repurchase shareholders have 10% fewer shares, but earnings and dividends per share are 10% higher. An investor who owns one share today that is not repurchased will receive no dividends in year 1 but can look forward to \$11 a year thereafter. The value of each share is therefore $11/ (.1 \times 1.1) = \$100$.

Our example illustrates several points. First, other things equal, company value is unaffected by the decision to repurchase stock rather than to pay a cash dividend. Second, when valuing the entire equity you need to include both the cash that is paid out as dividends and the cash that is used to repurchase stock. Third, when calculating the cash flow *per share*, it is double counting to include both the forecasted dividends per share *and* the cash received from repurchase (if you sell back your share, you don't get any subsequent dividends). Fourth, a firm that repurchases stock instead of paying dividends reduces the number of shares outstanding but produces an offsetting increase in subsequent earnings and dividends per share.

16-6 The Rightists

MM said that dividend policy is irrelevant because it does not affect shareholder value. MM did not say that payout should be random or erratic; for example, it may change over the life cycle of the firm. A young growth firm pays out little or nothing, to maximize the cash flow available for investment. As the firm matures, positive-NPV investment opportunities are harder to come by and growth slows down. There is cash available for payout to shareholders. At some point the firm commits to pay a regular dividend. It may also repurchase shares. In old age, profitable growth opportunities disappear, and payout may become much more generous.

Of course MM assumed absolutely perfect and efficient capital markets. In MM's world, everyone is a rational optimizer. The right-wing payout party points to real-world imperfections that could make high dividend payout ratios better than low ones. There is a natural clientele for high-payout stocks, for example. Some financial institutions are legally restricted from holding stocks lacking established dividend records.²¹ Trusts and endowment funds may prefer high-dividend stocks because dividends are regarded as spendable "income," whereas capital gains are "additions to principal."

There is also a natural clientele of investors, such as the elderly, who look to their stock portfolios for a steady source of cash to live on.²² In principle, this cash could be easily

²¹ Most colleges and universities are legally free to spend capital gains from their endowments, but they usually restrict spending to a moderate percentage that can be covered by dividends and interest receipts.

²² See, for example, J. R. Graham and A. Kumar, "Do Dividend Clienteles Exist? Evidence on Dividend Preferences of Retail Investors," *Journal of Finance* 61 (June 2006), pp. 1305-1336; and M. Baker, S. Nagel and J. Wurgler, "The Effect of Dividends on Consumption," *Brookings Papers on Economic Activities* (2007), pg 277-291.

Microsoft's Payout Bonanza

There is a point at which hoarding money becomes embarrassing. . . . Microsoft, which grew into the world's largest software company . . . and which has been generating cash at the rate of \$1 billion a month passed that point years ago. On July 20th, it finally addressed the issue.

Its solution was to give back to its shareholders, in various forms, an unprecedented \$75 billion. One dollop, to the tune of \$32 billion, will be a one-time dividend to be paid in December. Another will be share buybacks worth \$30 billion over four years.

The third will be a doubling of Microsoft's ongoing dividend to 32 cents a share annually, payable in quarterly instalments. Not bad for a company that has not even turned 30 yet, and that only declared its first dividend in January 2003.

The decision is impressive for the mature analysis by Microsoft of its role in the industry and the prospects for the future that it implies.

Source: "An End to Growth?" *The Economist*, July 24, 2004, p. 61. © 2004 The Economist Newspaper Group, Inc. Reprinted with permission. Further reproduction prohibited (www.economist.com).

generated from stocks paying no dividends at all; the investor could just sell off a small fraction of his or her holdings from time to time. But it is simpler and cheaper for the company to send a quarterly check than for its shareholders to sell, say, one share every three months. Regular dividends relieve many of its shareholders of transaction costs and considerable inconvenience.²³

Some observers have appealed to behavioral psychology to explain why we may prefer to receive those regular dividends rather than sell small amounts of stock.²⁴ We are all, they point out, liable to succumb to temptation. Some of us may hanker after fattening foods, while others may be dying for a drink. We could seek to control these cravings by willpower, but that can be a painful struggle. Instead, it may be easier to set simple rules for ourselves ("cut out chocolate," or "wine with meals only"). In just the same way, we may welcome the self-discipline that comes from spending only dividend income, and thereby sidestep the difficult decision of how much we should dip into capital.

Payout Policy, Investment Policy, and Management Incentives

Perhaps the most persuasive argument in favor of the rightist position is that paying out funds to shareholders prevents managers from misusing or wasting funds.²⁵ Suppose a company has plenty of free cash flow but few profitable investment opportunities. Shareholders may not trust the managers to spend retained earnings wisely and may fear that the money will be plowed back into building a larger empire rather than a more profitable one. In such cases investors may demand higher dividends or a stock repurchase not because these are valuable in themselves, but because they encourage a more careful, value-oriented investment policy.

²³ Those advocating generous dividends might go on to argue that a regular cash dividend relieves stockholders of the risk of having to sell shares at "temporarily depressed" prices. Of course, the firm will have to issue shares eventually to finance the dividend, but (the argument goes) the firm can pick the *right time* to sell. If firms really try to do this and if they are successful—two big *ifs*—then stockholders of high-payout firms might indeed get something for nothing.

²⁴ See H. Shefrin and M. Statman, "Explaining Investor Preference for Cash Dividends," *Journal of Financial Economics* 13 (June 1984), pp. 253–282.

²⁵ See M. Rozeff, "Growth, Beta and Agency Costs as Determinants of Dividend Payout Ratios," *Journal of Financial Research* 5 (1982), pp. 249–259; F. Easterbrook, "Two Agency Cost Explanations of Dividends," *American Economic Review* 74 (1984), pp. 650–659; and especially M. Jensen, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review* 76 (May 1986), pp. 323–329.

The nearby box describes how Microsoft announced the largest cash distribution in corporate history. By 2004 the company's investment opportunities had diminished, and investors were, therefore, happy to see Microsoft distribute its cash mountain.

Microsoft paid out its gigantic special dividend willingly. Other cash-cow corporations may let go of cash grudgingly under pressure from investors. Stock price falls when investors sense excessive perks or empire building. The threat of a falling stock price is an excellent motivator, particularly for top managers holding valuable stock options.

The willingness of mature corporations to make generous payouts shows that corporate governance works in the U.S. and other developed economies. But governance is less effective in many emerging economies, and managers' and stockholders' interests are not as closely aligned. Payout ratios are smaller where governance is weak.²⁶

16-7 Taxes and the Radical Left

The left-wing dividend creed is simple: Whenever dividends are taxed more heavily than capital gains, firms should pay the lowest cash dividend they can get away with. Available cash should be retained or used to repurchase shares.

By shifting their distribution policies in this way, corporations can transmute dividends into capital gains. If this financial alchemy results in lower taxes, it should be welcomed by any taxpaying investor. That is the basic point made by the leftist party when it argues for low-dividend payout.

If dividends are taxed more heavily than capital gains, investors should pay more for stocks with low dividend yields. In other words, they should accept a lower *pretax* rate of return from securities offering returns in the form of capital gains rather than dividends. Table 16.1 illustrates this. The stocks of firms A and B are equally risky. Investors expect A to be worth \$112.50 per share next year. The share price of B is expected to be only \$102.50, but a \$10 dividend is also forecasted, and so the total pretax payoff is the same, \$112.50.

	Firm A (No Dividend)	Firm B (High Dividend)
Next year's price	\$112.50	\$102.50
Dividend	\$0	\$10.00
Total pretax payoff	\$112.50	\$112.50
Today's stock price	\$100	\$97.78
Capital gain	\$12.50	\$4.72
Before-tax rate of return	$100 \times \left(\frac{12.5}{100}\right) = 12.5\%$	$100 \times \left(\frac{14.72}{97.78}\right) = 15.05\%$
Tax on dividend at 40%	\$0	$.40 \times 10 = \$4.00$
Tax on capital gains at 20%	$.20 \times 12.50 = \$2.50$	$.20 \times 4.72 = \$.94$
Total after-tax income (dividends plus capital gains less taxes)	$(0 + 12.50) - 2.50 = \$10.00$	$(10.00 + 4.72) - (4.00 + .94) = \9.78
After-tax rate of return	$100 \times \left(\frac{10}{100}\right) = 10.0\%$	$100 \times \left(\frac{9.78}{97.78}\right) = 10.0\%$

TABLE 16.1 Effects of a shift in dividend policy when dividends are taxed more heavily than capital gains. The high-payout stock (firm B) must sell at a lower price to provide the same after-tax return.

²⁶ See R. La Porta, F. Lopez-de-Silanes, A. Shleifer, and R. W. Vishny, "Agency Problems and Dividend Policies around the World," *Journal of Finance* 55 (February 2000), pp. 1-34.

Yet we find B's stock selling for less than A's and therefore offering a higher pretax rate of return. The reason is obvious: Investors prefer A because its return comes in the form of capital gains. Table 16.1 shows that A and B are equally attractive to investors who, we assume, pay a 40% tax on dividends and a 20% tax on capital gains. Each offers a 10% return after all taxes. The difference between the stock prices of A and B is exactly the present value of the extra taxes the investors face if they buy B.²⁷

The management of B could save these extra taxes by eliminating the \$10 dividend and using the released funds to repurchase stock instead. Its stock price should rise to \$100 as soon as the new policy is announced.

Why Pay Any Dividends at All?

It is true that when companies make very large one-off distributions of cash to shareholders, they generally choose to do so by share repurchase rather than by a large temporary hike in dividends. But if dividends attract more tax than capital gains, why should any firm ever pay a cash dividend? If cash is to be distributed to stockholders, isn't share repurchase always the best channel for doing so? The leftist position seems to call not just for low payouts but for *zero* payouts whenever capital gains have a tax advantage.

Few leftists would go quite that far. A firm that eliminates dividends and starts repurchasing stock on a regular basis may find that the Internal Revenue Service recognizes the repurchase program for what it really is and taxes the payments accordingly. That is why financial managers do not usually announce that they are repurchasing shares to save stockholders taxes; they give some other reason.²⁸

The low-payout party has nevertheless maintained that the market rewards firms that have low-payout policies. They have claimed that firms that paid dividends and as a result had to issue shares from time to time were making a serious mistake. Any such firm was essentially financing its dividends by issuing stock; it should have cut its dividends at least to the point at which stock issues were unnecessary. This would not only have saved taxes for shareholders but it would also have avoided the transaction costs of the stock issues.²⁹

Empirical Evidence on Dividends and Taxes

It is hard to deny that taxes are important to investors. You can see that in the bond market. Interest on municipal bonds is not taxed, and so municipals usually sell at low pretax yields. Interest on federal government bonds is taxed, and so these bonds sell at higher pretax yields. It does not seem likely that investors in bonds just forget about taxes when they enter the stock market.

There is some evidence that in the past taxes have affected U.S. investors' choice of stocks.³⁰ Lightly taxed institutional investors have tended to hold high-yield stocks and retail investors have preferred low-yield stocks. Moreover, this preference for low-yield stocks has been somewhat more marked for high-income individuals. Nevertheless, it seems that taxes have been only a secondary consideration with these investors, and have not deterred individuals in high-tax brackets from holding substantial amounts of dividend-paying stocks.

²⁷ Michael Brennan has modeled what happens when you introduce taxes into an otherwise perfect market. He found that the capital asset pricing model continues to hold, but on an *after-tax* basis. Thus, if A and B have the same beta, they should offer the same after-tax rate of return. The spread between pretax and post-tax returns is determined by a weighted average of investors' tax rates. See M. J. Brennan, "Taxes, Market Valuation and Corporate Financial Policy," *National Tax Journal* 23 (December 1970), pp. 417–427.

²⁸ They might say, "Our stock is a good investment," or, "We want to have the shares available to finance acquisitions of other companies." What do you think of these rationales?

²⁹ These costs can be substantial. Refer back to Chapter 15, especially Figure 15.5.

³⁰ See, for example, Y. Grinstein and R. Michaely, "Institutional Holdings and Payout Policy," *Journal of Finance* 60 (June 2005), pp. 1389–1426; and J. R. Graham and A. Kumar, "Do Dividend Clienteles Exist? Evidence on Dividend Preferences of Retail Investors," *Journal of Finance* 61 (June 2006), pp. 1305–1336.

If investors are concerned about taxes, we might also expect that, when the tax penalty on dividends is high, companies would think twice about increasing the payout. Only about a fifth of U.S. financial managers cite investor taxes as an important influence when the firm makes its dividend decision. On the other hand, firms have sometimes responded to major shifts in the way that investors are taxed. For example, when Australia introduced a tax change in 1987 that effectively eliminated the tax penalty on dividends for Australian investors, firms became more willing to increase their payout.³¹

If tax considerations are important, we would expect to find a historical tendency for high-dividend stocks to sell at lower prices and therefore to offer higher returns, just as in Table 16.1. Unfortunately, there are difficulties in measuring this effect. For example, suppose that stock A is priced at \$100 and is expected to pay a \$5 dividend. The *expected* yield is, therefore, $5/100 = .05$, or 5%. The company now announces bumper earnings and a \$10 dividend. Thus with the benefit of hindsight, A's *actual* dividend yield is $10/100 = .10$, or 10%. If the unexpected increase in earnings causes a rise in A's stock price, we will observe that a high actual yield is accompanied by a high actual return. But that would not tell us anything about whether a high *expected* yield was accompanied by a high *expected* return. To measure the effect of dividend policy, we need to estimate the dividends that investors expected.

A second problem is that nobody is quite sure what is meant by high dividend yield. For example, utility stocks have generally offered high yields. But did they have a high yield all year, or only in months or on days that dividends were paid? Perhaps for most of the year, they had zero yields and were perfect holdings for the highly taxed individuals.³² Of course, high-tax investors did not want to hold a stock on the days dividends were paid, but they could sell their stock temporarily to a security dealer. Dealers are taxed equally on dividends and capital gains and therefore should not have demanded any extra return for holding stocks over the dividend period.³³ If shareholders could pass stocks freely between each other at the time of the dividend payment, we should not observe any tax effects at all.

A number of researchers have attempted to tackle these problems and to measure whether investors demand a higher return from high-yielding stocks. Their findings offer some limited comfort to the dividends-are-bad school, for most of the researchers have suggested that high-yielding stocks have provided higher returns. However, the estimated tax rates differ substantially from one study to another. For example, while Litzenger and Ramaswamy concluded that investors have priced stocks as if dividend income attracted an extra 14% to 23% rate of tax, Miller and Scholes used a different methodology and came up with a negligible 4% difference in the rate of tax.³⁴

The Taxation of Dividends and Capital Gains

Many of these attempts to measure the effect of dividends are of more historical than current interest, for they look back at the years before 1986 when there was a dramatic

³¹ K. Pattenden and G. Twite, "Taxes and Dividend Policy under Alternative Tax Regimes," *Journal of Corporate Finance* 14 (2008), pp. 1–16.

³² Suppose there are 250 trading days in a year. Think of a stock paying quarterly dividends. We could say that the stock offers a high dividend yield on 4 days but a zero dividend yield on the remaining 246 days.

³³ The stock could also be sold to a corporation, which could "capture" the dividend and then resell the shares. Corporations are natural buyers of dividends, because they pay tax only on 30% of dividends received from other corporations. (We say more on the taxation of intercorporate dividends later in this section.)

³⁴ See R. H. Litzenger and K. Ramaswamy, "The Effects of Dividends on Common Stock Prices: Tax Effects or Information Effects," *Journal of Finance* 37 (May 1982), pp. 429–443; and M. H. Miller and M. Scholes, "Dividends and Taxes: Some Empirical Evidence," *Journal of Political Economy* 90 (1982), pp. 1118–1141. Merton Miller provides a broad review of the empirical literature in "Behavioral Rationality in Finance: The Case of Dividends," *Journal of Business* 59 (October 1986), pp. S451–S468.

difference between the taxation of dividends and capital gains.³⁵ As we write this in 2009, the top rate of tax on both dividends and capital gains is 15%.³⁶

There is, however, one way that tax law continues to favor capital gains. Taxes on dividends have to be paid immediately, but taxes on capital gains can be deferred until shares are sold and the capital gains are realized. Stockholders can choose when to sell their shares and thus when to pay the capital gains tax. The longer they wait, the less the present value of the capital gains tax liability.³⁷

The distinction between dividends and capital gains is not important for many financial institutions, which operate free of all taxes and therefore have no reason to prefer capital gains to dividends or vice versa. For example, pension funds are untaxed. These funds hold roughly \$3 trillion in common stocks, so they have enormous clout in the U.S. stock market. Only corporations have a tax reason to *prefer* dividends. They pay corporate income tax on only 30% of any dividends received. Thus the effective tax rate on dividends received by large corporations is 30% of 35% (the marginal corporate tax rate), or 10.5%. But they have to pay a 35% tax on the full amount of any realized capital gain.

The implications of these tax rules for dividend policy are pretty simple. Capital gains have advantages to many investors, but they are far less advantageous than they were 20 or 30 years ago.³⁸ Thus, the leftist case for minimizing cash dividends is weaker than it used to be.

Alternative Tax Systems

In the U.S. shareholders' returns are taxed twice. They are taxed at the corporate level (corporate tax) and in the hands of the shareholder (income tax or capital gains tax). These two tiers of tax are illustrated in Table 16.2, which shows the after-tax return to the shareholder if the company distributes all its income as dividends. We assume the company earns \$100 a share before tax and therefore pays corporate tax of $.35 \times 100 = \$35$. This leaves \$65

Operating income	100	
Corporate tax at 35%	<u>35</u>	← Corporate tax
After-tax income (paid out as dividends)	65	
Income tax paid by investor at 15%	<u>9.75</u>	← Second tax paid by investor
Net income to shareholder	55.25	

TABLE 16.2 In the United States returns to shareholders are taxed twice. This example assumes that all income after corporate taxes is paid out as cash dividends to an investor in the top income tax bracket (figures in dollars per share).

³⁵ The Tax Reform Act of 1986 equalized the tax rates on dividends and capital gains. A gap began to open up again in 1992.

³⁶ These rates were established by the *Jobs and Growth Tax Relief Reconciliation Act* of 2003 and have been extended to 2010. Note that capital gains realized within a year of purchase and dividends on stocks held for less than 61 days are taxed as ordinary income.

³⁷ When securities are sold, capital gains tax is paid on the difference between the selling price and the initial purchase price or *basis*. Thus, shares purchased in 2004 for \$20 (the basis) and sold for \$30 in 2009 would generate \$10 per share in capital gains and a tax of \$1.50 at a 15% tax rate.

Suppose the investor now decides to defer sale for one year. Then, if the interest rate is 5%, the present value of the tax, viewed from 2009, falls to $1.50/1.05 = \$1.43$. That is, the *effective* capital gains rate is 14.3%. The longer sale is deferred, the lower the effective rate will be.

The effective rate falls to zero if the investor dies before selling, because the investor's heirs get to "step up" the basis without recognizing any taxable gain. Suppose the price is still \$30 when the investor dies. The heirs could sell for \$30 and pay no tax, because they could claim a \$30 basis. The \$10 capital gain would escape tax entirely.

³⁸ We described above how Microsoft in 2004 declared a special dividend of \$32 billion. Would the company have done so if there had still been a substantial tax disadvantage to dividend payments? We doubt it.

a share to be paid out as a dividend, which is then subject to a second layer of tax. For example, a shareholder who is taxed at 15% pays tax on this dividend of $.15 \times 65 = \$9.75$. Only a tax-exempt pension fund or charity would retain the full \$65.

Of course, dividends are regularly paid by companies that operate under very different tax systems. For example, Germany partly compensates for the corporate layer of tax by levying income tax on only half an individual's dividend income.

In some other countries, such as Australia and New Zealand, shareholders' returns are not taxed twice. For example, in Australia shareholders are taxed on dividends, but they may deduct from this tax bill their share of the corporate tax that the company has paid. This is known as an *imputation tax system*. Table 16.3 shows how the imputation system works. Suppose that an Australian company earns pretax profits of A\$100 a share. After it pays corporate tax at 30%, the profit is A\$70 a share. The company now declares a net dividend of A\$70 and sends each shareholder a check for this amount. This dividend is accompanied by a tax credit saying that the company has already paid A\$30 of tax on the shareholder's behalf. Thus shareholders are treated as if each received a total, or gross, dividend of $70 + 30 = \text{A}\$100$ and paid tax of A\$30. If the shareholder's tax rate is 30%, there is no more tax to pay and the shareholder retains the net dividend of A\$70. If the shareholder pays tax at the top personal rate of 45%, then he or she is required to pay an additional \$15 of tax; if the tax rate is 15% (the rate at which Australian pension funds are taxed), then the shareholder receives a *refund* of $30 - 15 = \text{A}\$15$.³⁹

Under an imputation tax system, millionaires have to cough up the extra personal tax on dividends. If this is more than the tax that they would pay on capital gains, then millionaires would prefer that the company does not distribute earnings. If it is the other way around, they would prefer dividends.⁴⁰ Investors with low tax rates have no doubts about the matter. If the company pays a dividend, these investors receive a check from the revenue service for the excess tax that the company has paid, and therefore they prefer high payout rates.

	Rate of Income Tax		
	15%	30%	45%
Operating income	100	100	100
Corporate tax ($T_c = .30$)	<u>30</u>	<u>30</u>	<u>30</u>
After-tax income	70	70	70
Grossed-up dividend	100	100	100
Income tax	15	30	45
Tax credit for corporate payment	<u>-30</u>	<u>-30</u>	<u>-30</u>
Tax due from shareholder	-15	0	15
Available to shareholder	85	70	55

TABLE 16.3 Under imputation tax systems, such as that in Australia, shareholders receive a tax credit for the corporate tax that the firm has paid (figures in Australian dollars per share).

³⁹ In Australia, shareholders receive a credit for the full amount of corporate tax that has been paid on their behalf. In other countries the tax credit is less than the corporate tax rate. You can think of the tax system in these countries as lying between the Australian and U.S. systems.

⁴⁰ In the case of Australia the tax rate on capital gains is the same as the tax rate on dividends. However, for securities that are held for more than 12 months only half of the gain is taxed.

Look once again at Table 16.3 and think what would happen if the corporate tax rate were zero. The shareholder with a 15% tax rate would still end up with A\$85, and the shareholder with the 45% rate would still receive A\$55. Thus, under an imputation tax system, when a company pays out all its earnings, there is effectively only one layer of tax—the tax on the shareholder. The revenue service collects this tax through the company and then sends a demand to the shareholder for any excess tax or makes a refund for any overpayment.⁴¹

16-8 The Middle-of-the-Roaders

The middle-of-the-road party, which is principally represented by Miller, Black, and Scholes,⁴² maintains that a company's value is not affected by its dividend policy. Unlike the other two parties, they emphasize that the supply of dividends is free to adjust to the demand. Therefore, if companies could increase their stock price by changing their dividend payout, they would surely have done so. Presumably, dividends are where they are because no company believes that it could add value simply by upping or reducing its dividend payout.

This “supply argument” is not inconsistent with the existence of a clientele of investors who prefer low-payout stocks. If necessary, these investors would be prepared to pay a premium for low-payout stocks. But perhaps they do not have to. Enough firms may have already noticed the existence of this clientele and switched to low-payout policies. If so, there is no incentive for *additional* firms to switch to low-payout policies. Similarly, there may well be some investors who prefer high dividends, but these investors too already have a wide choice of suitable stocks. A third group of investors, such as pension funds and other tax-exempt institutions, may have no reason to prefer dividends to capital gains. These investors will be happy to hold both low- and high-payout stocks, and the value that they place on each stock will be unaffected by the company's dividend policy. In that case we are back in an MM world where dividend policy does not affect value.⁴³

The middle-of-the-roaders stress that companies would not supply such a large quantity of dividends unless they believed that this was what investors wanted. But that still leaves a puzzle. Even in the days when there was a large tax disadvantage to dividends, many investors were apparently happy to hold high-payout stocks. Why? The response of the middle-of-the-roaders has been to argue that there are always plenty of wrinkles in the tax system that shareholders can use to avoid paying taxes on dividends. For example, instead of investing directly in common stocks, they can do so through a pension fund or insurance company, which receives more favorable tax treatment. However, it is not clear that this is the whole story, for a high proportion of dividends is regularly paid out to wealthy individuals and included in their taxable income.⁴⁴

⁴¹ This is only true for earnings that are paid out as dividends. Retained earnings are subject to corporate tax. Shareholders get the benefit of retained earnings in the form of capital gains.

⁴² F. Black and M. S. Scholes, “The Effects of Dividend Yield and Dividend Policy on Common Stock Prices and Returns,” *Journal of Financial Economics* 1 (May 1974), pp. 1–22; M. H. Miller and M. S. Scholes, “Dividends and Taxes,” *Journal of Financial Economics* 6 (December 1978), pp. 333–364; and M. H. Miller, “Behavioral Rationality in Finance: The Case of Dividends,” *Journal of Business* 59 (October 1986), pp. S451–S468.

⁴³ Baker and Wurgler argue that the demand for dividends may change. When this is reflected in stock prices, firms adjust their dividend policy to cater for the shift in demand. Thus a shift in clienteles shows up in a change in firms' propensity to pay dividends. See M. Baker and J. Wurgler, “A Catering Theory of Dividends,” *Journal of Finance* 59 (June 2004), pp. 1125–1165.

⁴⁴ See, for example, F. Allen and R. Michaely, “Payout Policy,” in *Handbook of the Economics of Finance: Corporate Finance*, G. Constantinides, M. Harris, and R. Stulz, (eds.), (Amsterdam: North-Holland, 2003).

There is another possible reason that U.S. companies may pay dividends even when these dividends result in higher tax bills. Companies that pay *low* dividends will be more attractive to highly taxed individuals; those that pay *high* dividends will have a greater proportion of pension funds or other tax-exempt institutions as their stockholders. These financial institutions are sophisticated investors; they monitor carefully the companies that they invest in and they bring pressure on poor managers to perform. Successful, well-managed companies are happy to have financial institutions as investors, but their poorly managed brethren would prefer unsophisticated and more docile stockholders.

You can probably see now where the argument is heading. Well-managed companies want to signal their worth. They can do so by having a high proportion of demanding institutions among their stockholders. How do they achieve this? By paying high dividends. Those shareholders who pay tax do not object to these high dividends as long as the effect is to encourage institutional investors who are prepared to put the time and effort into monitoring the management.⁴⁵

Payout Policy and the Life Cycle of the Firm

MM said that dividend policy does not affect shareholder value. Shareholder value is driven by the firm's investment policy, including its future growth opportunities. Financing policy, including the choice between debt and equity, can also affect value, as we will see in Chapter 18.

In MM's analysis, payout is a residual, a by-product of other financial policies. The firm should make investment and financing decisions, and then pay out whatever cash is left over. Therefore payout should change over the life cycle of the firm.

MM assumed a perfect and rational world, but many of the complications discussed in this chapter actually reinforce the life cycle of payout. Let's review the life-cycle story.⁴⁶

Young growth firms have plenty of profitable investment opportunities. During this time it is efficient to retain and reinvest all operating cash flow. Why pay out cash to investors if the firm then has to replace the cash by borrowing or issuing more shares? Retaining cash avoids costs of issuing securities and minimizes shareholders' taxes. Investors are not worried about wasteful overinvestment, because investment opportunities are good, and managers' compensation is tied to stock price.

As the firm matures, positive-NPV projects become scarcer relative to cash flow. The firm begins to accumulate cash. Now investors begin to worry about overinvestment or excessive perks. The investors pressure management to start paying out cash. Sooner or later, managers comply—otherwise stock price stagnates. The payout may come as share repurchases, but initiating a regular cash dividend sends a stronger and more reassuring signal of financial discipline. The commitment to financial discipline can outweigh the tax costs of dividends. (The middle-of-the-road party argues that the tax costs of paying cash dividends may not be that large, particularly in recent years, when U.S. personal tax rates on dividends and capital gains have been low.) Regular dividends may also be attractive to some types of investors, for example, retirees who depend on dividends for living expenses.

As the firm ages, more and more payout is called for. The payout may come as higher dividends or large repurchases. Sometimes the payout comes as the result of a takeover. Shareholders are bought out, and the firm's new owners generate cash by selling assets and restructuring operations. We discuss takeovers in Chapter 32.

⁴⁵ This signaling argument is developed in F. Allen, A. E. Bernardo, and I. Welch, "A Theory of Dividends Based on Tax Clienteles," *Journal of Finance* 55 (December 2000), pp. 2499–2536.

⁴⁶ Here we are following a life-cycle theory set out in H. DeAngelo, L. DeAngelo, and D. Skinner, "Corporate Payout Policy," *Foundations and Trends in Finance* 3 (2008), pp. 95–287.



SUMMARY

When managers decide on the dividend, their primary concern seems to be to give shareholders a “fair” payment on their investment. However, most managers are very reluctant to reduce dividends and will not increase the payout unless they are confident it can be maintained.

As an alternative to dividend payments, the company can repurchase its own stock. In recent years companies have bought back their stock in large quantities, but repurchases do not generally substitute for dividends. Instead they are used to return unwanted cash to shareholders or to retire equity and replace it with debt.

If we hold the company’s investment decision and capital structure constant, then payout policy is a trade-off between cash dividends and the issue or repurchase of common stock. Should firms retain whatever earnings are necessary to finance growth and pay out any residual as cash dividends? Or should they increase dividends and then (sooner or later) issue stock to make up the shortfall of equity capital? Or should they reduce dividends and use the released cash to repurchase stock?

If we lived in an ideally simple and perfect world, there would be no problem, for the choice would have no effect on market value. The controversy centers on the effects of dividend policy in our flawed world. Many investors believe that a high dividend payout enhances share price. Perhaps they welcome the self-discipline that comes from spending only dividend income rather than having to decide whether they should dip into capital. We suspect also that investors often pressure companies to increase dividends when they do not trust management to spend free cash flow wisely. In this case a dividend increase may lead to a rise in the stock price not because investors like dividends as such but because they want managers to run a tighter ship.

The most obvious and serious market imperfection has been the different tax treatment of dividends and capital gains. In the past, dividends in the United States have often been much more heavily taxed than capital gains. In 2003 the maximum tax rate was set at 15% on both dividends and gains, though capital gains continued to enjoy one advantage—the tax payment is not due until any gain was realized. If dividends are more heavily taxed, highly taxed investors should hold mostly low-payout stocks, and we would expect high-payout stocks to offer investors the compensation of greater pretax returns.

This view has a respectable theoretical basis. It is supported by some evidence that, when dividends were at a significant tax disadvantage in the U.S., gross returns did reflect the tax differential. The weak link is the theory’s silence on the question of why companies continued to distribute such large dividends when they landed investors with such large tax bills.

The third view of dividend policy starts with the notion that the actions of companies do reflect investors’ preferences; thus the fact that companies pay substantial dividends is the best evidence that investors want them. If the supply of dividends exactly meets the demand, no single company could improve its market value by changing its payout policy.

It is difficult to be dogmatic over these controversies. If investment policy and borrowing are held constant, then the arguments over payout policy are largely about shuffling money from one pocket to another. Unless there are substantial tax consequences to these shuffles, it is unlikely that firm value is greatly affected either by the total amount of the payout or the choice between dividends and repurchase. Investors’ concern with payout decisions seems to stem mainly from the information that they read into managers’ actions.

The bottom-line conclusion, if there is one, is that payout varies over the life cycle of the firm. Young growth firms pay no cash dividends and rarely repurchase stock. These firms have profitable investment opportunities. They finance these investments as much as possible from internally generated cash flow. As firms mature, profitable investment opportunities shrink relative to cash flow. The firm comes under pressure from investors, because investors worry that managers will overinvest if there is too much idle cash available. The threat of a lagging stock price pushes managers to distribute cash by repurchases or cash dividends. Committing to a regular cash dividend sends the more credible signal of financial discipline.

**FURTHER
READING**

For comprehensive reviews of the literature on payout policy, see:

F. Allen and R. Michaely, "Payout Policy," in G. Constantinides, M. Harris, and R. Stulz, (eds.), *Handbook of the Economics of Finance: Corporate Finance* (Amsterdam: North-Holland, 2003).

H. DeAngelo, L. DeAngelo, and D. Skinner, "Corporate Payout Policy," *Foundations and Trends in Finance* 3 (2008), pp. 95–287.

For a recent survey of managers' attitudes to the payout decision, see:

A. Kalay and M. Lemmon, "Payout Policy," in B. E. Eckbo (ed.), *Handbook of Empirical Corporate Finance* (Amsterdam: Elsevier/North-Holland, 2007), Chapter 10.

A. Brav, J. R. Graham, C. R. Harvey, and R. Michaely, "Payout Policy in the 21st Century," *Journal of Financial Economics* 77 (September 2005), pp. 483–527.



Select problems are available in McGraw-Hill Connect. Please see the preface for more information.

PROBLEM SETS

BASIC

1. In 2009 J. M. Smucker paid a regular quarterly dividend of \$.35 a share.
 - a. Match each of the following sets of dates:

(A1) 17 July 2009	(B1) Record date
(A2) 11 August 2009	(B2) Payment date
(A3) 12 August 2009	(B3) Ex-dividend date
(A4) 14 August 2009	(B4) Last with-dividend date
(A5) 1 September 2009	(B5) Declaration date
 - b. On one of these dates the stock price is likely to fall by about the value of the dividend. Which date? Why?
 - c. Smucker's stock price in August 2009 was \$52. What was the dividend yield?
 - d. If earnings per share for 2009 are \$4.56, what is the percentage payout rate?
 - e. Suppose that in 2009 the company paid a 10% stock dividend. What would be the expected fall in price?
2. Here are several "facts" about typical corporate dividend policies. Which are true and which false?
 - a. Companies decide each year's dividend by looking at their capital expenditure requirements and then distributing whatever cash is left over.
 - b. Managers and investors seem more concerned with dividend changes than with dividend levels.
 - c. Managers often increase dividends temporarily when earnings are unexpectedly high for a year or two.
 - d. Companies undertaking substantial share repurchases usually finance them with an offsetting reduction in cash dividends.
3. a. Wotan owns 1,000 shares of a firm that has just announced an increase in its dividend from \$2.00 to \$2.50 a share. The share price is currently \$150. If Wotan does not wish to spend the extra cash, what should he do to offset the dividend increase?

- b. Brunhilde owns 1,000 shares of a firm that has just announced a dividend cut from \$8.00 a share to \$5.00. The share price is currently \$200. If Brunhilde wishes to maintain her consumption, what should she do to offset the dividend cut?
4. Patriot Games has 5 million shares outstanding. The president has proposed that, given the firm's large cash holdings, the annual dividend should be increased from \$6.00 a share to \$8.00. If you agree with the president's plans for investment and capital structure, what else must the company do as a consequence of the dividend increase?
5. House of Haddock has 5,000 shares outstanding and the stock price is \$140. The company is expected to pay a dividend of \$20 per share next year and thereafter the dividend is expected to grow indefinitely by 5% a year. The President, George Mullet, now makes a surprise announcement: He says that the company will henceforth distribute half the cash in the form of dividends and the remainder will be used to repurchase stock.
- What is the total value of the company before and after the announcement? What is the value of one share?
 - What is the expected stream of dividends per share for an investor who plans to retain his shares rather than sell them back to the company? Check your estimate of share value by discounting this stream of dividends per share.
6. Here are key financial data for House of Herring, Inc.:

Earnings per share for 2015	\$5.50
Number of shares outstanding	40 million
Target payout ratio	50%
Planned dividend per share	\$2.75
Stock price, year-end 2015	\$130

House of Herring plans to pay the entire dividend early in January 2016. All corporate and personal taxes were repealed in 2014.

- Other things equal, what will be House of Herring's stock price after the planned dividend payout?
 - Suppose the company cancels the dividend and announces that it will use the money saved to repurchase shares. What happens to the stock price on the announcement date? Assume that investors learn nothing about the company's prospects from the announcement. How many shares will the company need to repurchase?
 - Suppose the company increases dividends to \$5.50 per share and then issues new shares to recoup the extra cash paid out as dividends. What happens to the with- and ex-dividend share prices? How many shares will need to be issued? Again, assume investors learn nothing from the announcement about House of Herring's prospects.
7. Answer the following question twice, once assuming current tax law and once assuming zero tax on capital gains.

Suppose all investments offered the same expected return *before* tax. Consider two equally risky shares, Hi and Lo. Hi shares pay a generous dividend and offer low expected capital gains. Lo shares pay low dividends and offer high expected capital gains. Which of the following investors would prefer the Lo shares? Which would prefer the Hi shares? Which should not care? (Assume that any stock purchased will be sold after one year.)

- A pension fund.
- An individual.
- A corporation.
- A charitable endowment.
- A security dealer.

INTERMEDIATE

8. Look in a recent issue of *The Wall Street Journal* at “Dividend News” and choose a company reporting a regular dividend.
 - a. How frequently does the company pay a regular dividend?
 - b. What is the amount of the dividend?
 - c. By what date must your stock be registered for you to receive the dividend?
 - d. How much later is the dividend paid?
 - e. Look up the stock price and calculate the annual yield on the stock.
9. Which types of companies would you expect to distribute a relatively high or low proportion of current earnings? Which would you expect to have a relatively high or low price-earnings ratio?
 - a. High-risk companies.
 - b. Companies that have experienced an unexpected decline in profits.
 - c. Companies that *expect* to experience a decline in profits.
 - d. Growth companies with valuable future investment opportunities.
10. Little Oil has outstanding 1 million shares with a total market value of \$20 million. The firm is expected to pay \$1 million of dividends next year, and thereafter the amount paid out is expected to grow by 5% a year in perpetuity. Thus the expected dividend is \$1.05 million in year 2, \$1.105 million in year 3, and so on. However, the company has heard that the value of a share depends on the flow of dividends, and therefore it announces that next year’s dividend will be increased to \$2 million and that the extra cash will be raised immediately by an issue of shares. After that, the total amount paid out each year will be as previously forecasted, that is, \$1.105 million in year 2 and increasing by 5% in each subsequent year.
 - a. At what price will the new shares be issued in year 1?
 - b. How many shares will the firm need to issue?
 - c. What will be the expected dividend payments on these new shares, and what therefore will be paid out to the *old* shareholders after year 1?
 - d. Show that the present value of the cash flows to current shareholders remains \$20 million.
11. We stated in Section 16-5 that MM’s proof of dividend irrelevance assumes that new shares are sold at a fair price. Look back at problem 10. Assume that new shares are issued in year 1 at \$10 a share. Show who gains and who loses. Is dividend policy still irrelevant? Why or why not?
12. Respond to the following comment: “It’s all very well saying that I can sell shares to cover cash needs, but that may mean selling at the bottom of the market. If the company pays a regular cash dividend, investors avoid that risk.”
13. Refer to the first balance sheet prepared for Rational Demiconductor in Section 16-5. Again it uses cash to pay a \$1,000 cash dividend, planning to issue stock to recover the cash required for investment. But this time catastrophe hits before the stock can be issued. A new pollution control regulation increases manufacturing costs to the extent that the value of Rational Demiconductor’s existing business is cut in half, to \$4,500. The NPV of the new investment opportunity is unaffected, however. Show that dividend policy is still irrelevant.
14. “Many companies use stock repurchases to increase earnings per share. For example, suppose that a company is in the following position:

Net profit	\$10 million
Number of shares before repurchase	1 million
Earnings per share	\$10
Price-earnings ratio	20
Share price	\$200

The company now repurchases 200,000 shares at \$200 a share. The number of shares declines to 800,000 shares and earnings per share increase to \$12.50. Assuming the price-earnings ratio stays at 20, the share price must rise to \$250.” Discuss.

15. Hors d’Age Cheeseworks has been paying a regular cash dividend of \$4 per share each year for over a decade. The company is paying out all its earnings as dividends and is not expected to grow. There are 100,000 shares outstanding selling for \$80 per share. The company has sufficient cash on hand to pay the next annual dividend.

Suppose that Hors d’Age decides to cut its cash dividend to zero and announces that it will repurchase shares instead.

 - a. What is the immediate stock price reaction? Ignore taxes, and assume that the repurchase program conveys no information about operating profitability or business risk.
 - b. How many shares will Hors d’Age purchase?
 - c. Project and compare future stock prices for the old and new policies. Do this for at least years 1, 2, and 3.
16. An article on stock repurchase in the *Los Angeles Times* noted: “An increasing number of companies are finding that the best investment they can make these days is in themselves.” Discuss this view. How is the desirability of repurchase affected by company prospects and the price of its stock?
17. Comment briefly on each of the following statements:
 - a. “Unlike American firms, which are always being pressured by their shareholders to increase dividends, Japanese companies pay out a much smaller proportion of earnings and so enjoy a lower cost of capital.”
 - b. “Unlike new capital, which needs a stream of new dividends to service it, retained earnings have zero cost.”
 - c. “If a company repurchases stock instead of paying a dividend, the number of shares falls and earnings per share rise. Thus stock repurchase must always be preferred to paying dividends.”
18. Formaggio Vecchio has just announced its regular quarterly cash dividend of \$1 per share.
 - a. When will the stock price fall to reflect this dividend payment—on the record date, the ex-dividend date, or the payment date?
 - b. Assume that there are no taxes. By how much is the stock price likely to fall?
 - c. Now assume that *all* investors pay tax of 30% on dividends and nothing on capital gains. What is the likely fall in the stock price?
 - d. Suppose, finally, that everything is the same as in part (c), except that security dealers pay tax on *both* dividends and capital gains. How would you expect your answer to (c) to change? Explain.
19. Refer back to Problem 18. Assume no taxes and a stock price immediately after the dividend announcement of \$100.
 - a. If you own 100 shares, what is the value of your investment? How does the dividend payment affect your wealth?
 - b. Now suppose that Formaggio Vecchio cancels the dividend payment and announces that it will repurchase 1% of its stock at \$100. Do you rejoice or yawn? Explain.
20. The shares of A and B both sell for \$100 and offer a pretax return of 10%. However, in the case of company A the return is entirely in the form of dividend yield (the company pays a regular annual dividend of \$10 a share), while in the case of B the return comes entirely as capital gain (the shares appreciate by 10% a year). Suppose that dividends and capital gains are both taxed at 30%. What is the after-tax return on share A? What is the after-tax return on share B to an investor who sells after two years? What about an investor who sells after 10 years?

21. a. The Horner Pie Company pays a quarterly dividend of \$1. Suppose that the stock price is expected to fall on the ex-dividend date by \$.90. Would you prefer to buy on the with-dividend date or the ex-dividend date if you were (i) a tax-free investor, (ii) an investor with a marginal tax rate of 40% on income and 16% on capital gains?
- b. In a study of ex-dividend behavior, Elton and Gruber⁴⁷ estimated that the stock price fell on the average by 85% of the dividend. Assuming that the tax rate on capital gains was 40% of the rate on income tax, what did Elton and Gruber's result imply about investors' marginal rate of income tax?
- c. Elton and Gruber also observed that the ex-dividend price fall was different for high-payout stocks and for low-payout stocks. Which group would you expect to show the larger price fall as a proportion of the dividend?
- d. Would the fact that investors can trade stocks freely around the ex-dividend date alter your interpretation of Elton and Gruber's study?
- e. Suppose Elton and Gruber repeated their tests for 2009, when the tax rate was the same on dividends and capital gains. How would you expect their results to have changed?
22. The middle-of-the-road party holds that dividend policy doesn't matter because the *supply* of high-, medium-, and low-payout stocks has already adjusted to satisfy investors' demands. Investors who like generous dividends hold stocks that give them all the dividends that they want. Investors who want capital gains see ample low-payout stocks to choose from. Thus, high-payout firms cannot gain by transforming to low-payout firms, or vice versa.

Suppose the government reduces the tax rate on dividends but not on capital gains. Suppose that before this change the supply of dividends matched investor needs. How would you expect the tax change to affect the total cash dividends paid by U.S. corporations and the proportion of high- versus low-payout companies? Would dividend policy still be irrelevant after any dividend supply adjustments are completed? Explain.

CHALLENGE

23. Consider the following two statements: "Dividend policy is irrelevant," and "Stock price is the present value of expected future dividends." (See Chapter 4.) They *sound* contradictory. This question is designed to show that they are fully consistent.

The current price of the shares of Charles River Mining Corporation is \$50. Next year's earnings and dividends per share are \$4 and \$2, respectively. Investors expect perpetual growth at 8% per year. The expected rate of return demanded by investors is $r = 12\%$.

We can use the perpetual-growth model to calculate stock price:

$$P_0 = \frac{\text{DIV}}{r - g} = \frac{2}{.12 - .08} = 50$$

Suppose that Charles River Mining announces that it will switch to a 100% payout policy, issuing shares as necessary to finance growth. Use the perpetual-growth model to show that current stock price is unchanged.

24. "If a company pays a dividend, the investor is liable for tax on the total value of the dividend. If instead the company distributes the cash by stock repurchase, the investor is liable for tax only on any capital gain rather than on the entire amount. Therefore, even if the tax rates on dividend income and capital gains are the same, stock repurchase is always preferable to a dividend payment." Explain with a simple example why this is not the case. (Ignore the fact that capital gains may be postponed.)

⁴⁷ E. J. Elton and M. J. Gruber, "Marginal Stockholders' Tax Rates and the Clientele Effect," *Review of Economics and Statistics* 52 (1970), pp. 68-74.

25. Adherents of the “dividends-are-good” school sometimes point to the fact that stocks with high yields tend to have above-average price-earnings multiples. Is this evidence convincing? Discuss.
26. Suppose that there are just three types of investors with the following tax rates:

	Individuals	Corporations	Institutions
Dividends	50%	5%	0%
Capital gains	15	35	0

Individuals invest a total of \$80 billion in stock and corporations invest \$10 billion. The remaining stock is held by the institutions. All three groups simply seek to maximize their after-tax income.

These investors can choose from three types of stock offering the following pretax payouts:

	Low Payout	Medium Payout	High Payout
Dividends	\$5	\$5	\$30
Capital gains	15	5	0

These payoffs are expected to persist in perpetuity. The low-payout stocks have a total market value of \$100 billion, the medium-payout stocks have a value of \$50 billion, and the high-payout stocks have a value of \$120 billion.

- Who are the marginal investors that determine the prices of the stocks?
- Suppose that this marginal group of investors requires a 12% after-tax return. What are the prices of the low-, medium-, and high-payout stocks?
- Calculate the after-tax returns of the three types of stock for each investor group.
- What are the dollar amounts of the three types of stock held by each investor group?