

Chapter 15 Payout Policy

Chapter Overview

The *What Companies Do* opening feature examines Starbucks' first dividend payment. Many companies paid dividends in 2010 and these payouts were attributed to the large cash build-up relative to the market values of many firms. Starbucks was an example of this phenomenon. After two years of poor performance and store closings, in the first quarter of 2010, Starbucks announced its first dividend payout. They announced not only a 10 cent dividend per share but also announced they would begin to buy back their own shares. Most analysts believe Starbucks has passed the fast-growth stage and are entering a maturity period.

What Companies Do Discussion Questions

1. What did Starbucks' share repurchase and enhanced dividend say about its future prospects?

This chapter relates the dividend decision to the overall capital structure/financing decision through:

- 15-1. Payout Policy Fundamentals
- 15-2. Factors Affecting Dividend and Share Repurchase Decisions
- 15-3. Dividends in Perfect and Imperfect Worlds
- 15-4. Real-World Influences on Payout Policy
- 15-5. Payout Policy: Key Lessons

Technology

1. **Smart Video.** Scott Lee of Texas A&M University talks about the strong, positive market reaction to announcements of company share repurchases.
2. **Smart Video.** John Graham of Duke University talks about firms initiating dividends and increasing already-existing dividends.
3. **Smart Video.** Kenneth Eades of the University of Virginia notes that it is the earnings that support dividends that are important.
4. **Smart Video.** Frank Popoff, retired chairman of the board of Dow Chemical, discusses the role of the board of directors in determining dividends.
5. **Smart Video.** Andy Bryant, CFO for Intel, explains that dividends are an effective way to return cash to shareholders.
6. **Smart Video.** Cynthia Lucchese, CFA Hillenbrand Industries discusses the decision whether to return cash as dividends or share repurchases
7. **Smart Concepts.** A step-by-step explanation of dividend irrelevance.

After studying this chapter you should be able to:

- discuss the fundamentals of payout policy, including cash dividend payment procedures, types of policies and share repurchases
- describe some of the key factors affecting dividend and share repurchase decisions
- understand why payout policy is irrelevant in a world with perfect capital markets

- review the arguments for dividend relevance in the imperfect (real) world, including agency and signalling models
- review real-world influences on payout policy such as taxes, transactions costs and uncertainty
- summarise key lessons regarding payout policy.

Lecture Guide

Dividend policy is an important part of the firm's financing decision. If a firm chooses to pay out a higher percentage of its net income as dividends, then it may need to raise more money in the external markets in order to fund its investment projects.

15-1 Payout Policy Fundamentals

This section explains basic dividend terminology and concepts.

15-1a Cash Dividend Payment Procedures

Note that laws do not prohibit firms from paying more in dividends than their current earnings. If bondholders want to protect themselves, they must write such restrictions into bond covenants. This relates back to the previous chapter. A firm in financial distress may wish to distribute as much of its value as possible to shareholders before the bondholders take over the firm. Bondholders may wish to protect themselves by preventing management from making distributions out of anything except current earnings and new equity.

Figure 15.1 US Payouts 1990 to 2009: Dividends, Repurchases and Earnings

Figure 15.2 A Timeline Illustrating Important Dates in the Dividend Process

15-1b Types of Dividend Payout Policies

- Constant Payout Ratio Policy
- Constant Dollar Payout Policy
- Low-Regular and Extra Payout Policy

15-1c Bonus Shares and Share Splits

Note that share splits are like large bonus share payments. (Or, bonus share payments are small share splits). In the US, bonus share issues are referred to as stock dividend issues. While, from an accounting standpoint, share splits and bonus share payments do not impact share value, they may contain information about the firm. Paying bonus shares in place of a cash dividend is generally perceived as bad news – the firm doesn't have enough funds to pay the dividend. A *share split* is generally perceived as good news. This may be because firms that split their shares often later increase the dividend. A *reverse share split* may be considered bad news, particularly if the firm's shares have lost a great deal in value, and the firm performs the reverse share split to shore up share price.

15-1d Share Repurchases

Share repurchases are increasingly popular among Australian and US companies. Undervaluation is the most commonly cited reason for repurchase. A repurchase is an indicator of management confidence in the company, and their willingness to support that opinion with an investment in the company's shares. Not only does the share price generally rise on the announcement of a share repurchase, but earnings forecast by analysts tend to be revised upward. There is also evidence that open market share repurchases made by a company are a form of legal insider trading. A NYSE specialist in a firm's shares holds inventory in that stock and matches buyers and sellers or takes the other side of the trade. The specialists' costs are the inventory cost of holding shares, the information cost of trading with investors who know more about the firm than they do. The specialist

profits from the bid-ask spread, buying shares at a lower cost than that at which he/she resells those shares to another buyer. If specialists have reason to believe that more traders know more than they do, their risk increases, and they will raise the bid-ask spread. This does indeed happen after a company announces a share repurchase. The specialist (and the market) assumes the company management knows more about the company than they do and that uninformed investors are more likely to be at the losing end of the trade. The reaction to this increased risk is to increase returns. This is accomplished in the specialists' case by raising the bid-ask spread.

15-2 Factors Affecting Dividend and Share Repurchase Decisions

15-2a CFO Views on Dividends and Repurchases

The findings from a 2005 survey of 384 CFOs and treasurers along with extensive one-on-one interviews with two dozen additional CFOs and treasurers yield a great deal of insight into the behaviours of US firms. For example, many CFOs agree that there are negative consequences to a reduction in dividends but share repurchases are not viewed in the same light.

There have also been startling changes in US firms' dividend practices – a steep decline in the number of firms paying dividends. While this might be expected of young, high tech NASDAQ companies, this trend was also observed among NYSE firms. Part of the explanation is that there are many more companies today than in the past, and these brand new companies rarely pay dividends.

Figure 15.3 CFOs' Views on Dividends and Repurchases

15-2b Further Evidence on Dividend and Share Repurchase Practices

This section discusses the effects of dividends and repurchases on the firm value. For example, when a firm buys back shares, EPS will rise after a share repurchase. This can be a major factor in a firm's decision in repurchasing shares. Dividend effects are also seen in a different light. Dividends are changed or implemented more cautiously due to the impact to the firm value if dividends are lowered or stopped.

Firms in the same industry tend to have similar dividend patterns. Firms that are more mature, have stable cash flows; they generate cash with fewer investment opportunities and tend to have the highest dividend payout ratios.

- *Student Involvement:* Ask students to speculate on which industry characteristics make the listed firms tend to have higher or lower dividend payout ratios. For example, electric utilities have very steady income and high capital expenditures – their customers are not likely to cut out electric service even in recessionary times. The biotech industry is relatively new and risky, and biotech companies tend to use their internally generated funds for further investment, not for dividends.

Figure 15.4 CFOs' Views on Why Companies Repurchase Shares

15-3 Dividends in Perfect and Imperfect Worlds

15-3a Payout Policy Irrelevance in a World with Perfect Capital Markets

The process of proving dividend irrelevance is similar to proving capital structure irrelevance. Note the assumptions to make this work, in particular that dividends are equivalent to capital gains as far as investors are concerned.

- *Student Involvement:* Ask students what real world factors may invalidate theoretical dividend irrelevance.

- **Example: Payout Company and Retention Company**
 - Provides a numerical example of the differences in firm value for a firm that pays dividends and one that retains its earnings.

15-3b Miller and Modigliani Meet the (Imperfect) Real World

This section discusses the impact of dividend behaviour on Modigliani and Miller's Irrelevance Theory. The various imperfections of the real world cause issues with this pivotal financial theory. This section also discusses the impact of agency costs and various theories that result from these real world facts.

Figure 15.5 Dividends and Repurchases in the European Union, 1989-2006

15-4 Real World Influences on Payout Policies

Investors may be attracted to companies that have dividend payouts that suit their personal preferences. For example, retirees might prefer a portfolio of high dividend paying shares so they can spend their dividend income. They might choose to invest in utilities and other companies that traditionally pay high dividends. While in theory capital gains and dividends are perfect substitutes, in reality, an individual faces transactions costs in selling shares. On the other hand, dividends are fully taxed at the individual's marginal personal income tax rate, while capital gains are taxed at a lower marginal rate. Companies may develop tax clients, based on preferences for current income vs capital gains, which are taxed at lower rates. Ask students to fill in the following grid. Suppose a company has a high dividend payout, and has a high need for investment funds. What are its options?

Firm Need for Investment Funds	Shareholder Preferences	
	Current Income	Capital Gains
Low need	High dividend payout	Share repurchase
High need	Low payout and attract a new clientele OR High payout and have new debt and equity issues	Low dividend payout

Note that low dividend payouts may be a predictor of weak future earnings growth. On average real S&P 500 earnings declines by .75% a year in the decade following years with very low dividend payout ratios. The decade following years with very high payout rates had average annual real earnings gains of 3.2%. A possible explanation for this is that managers, who believe earnings growth will be strong in the future, feel they have room to increase dividends. Low payout ratios may signal that earnings are not sustainable. Note also that US dividend yields were at an all time low of 1.2% in the beginning of 2000, the peak of a US stock market boom.

Transactions costs may work towards either high or low dividend payouts. Individuals and companies that wish to reinvest their earnings may prefer low payouts. Investors who prefer current income will face lower transactions costs when the companies they invest in pay high dividends – they will not have to sell stock to obtain current income.

Advantages of a stable dividend policy include: developing a clientele that prefers the company's existing dividend payout policy, appealing to institutional investors who might want investments that provide current income (that they can spend like dividends) and demonstrated that the company has a steady, stable income. (Many institutions can only invest in shares with a dividend paying history.)

15-4a Personal Income Taxes

When the personal income tax rate on dividends is higher than the tax rate on capital gains, firms should repurchase and not issue dividends.

15-4b Trading and Other Transactions Costs

If the cost of cashing in shares is too high to generate cash for investors, they will begin to look for shares that issue dividends. And on the other side of the coin, if issuing securities is very costly, then firms should retain funds – not issue dividends.

15-4c The Residual Theory of Dividends

15-4d Paying Dividends as a Means of Communicating Information

Dividends can convey information to shareholders because only firms in a strong financial position – or the maturity phase of financial cycle – can afford to pay dividends.

15-4e What Type of Information Is Being Communicated?

15-4f Dividend Payments as Solutions to Agency Problems

15-5 Payout Policy: Key Lessons

Chapter 15 Resource Articles

'Cisco Shareholders Strongly Reject Dividend Proposal,' *Wall Street Journal*, 20 November 2002. Cisco shareholders, by a wide margin, voted against a dividend. Shareholders said they would prefer stock buybacks, but would favour dividends if they were tax-free. In the year before the vote, Cisco had repurchased \$3 billion of its shares and the board had authorised repurchases of up to \$8 billion.

'So Much Cash, So Few Dividends,' *Business Week*, 20 January 2003. This article is a commentary on the cash stores of some major companies like Microsoft and Cisco that do not pay dividends.

'Will Stock Dividends Get Back their Respect,' *Wall Street Journal*, 10 December 2002. This article looks at the proposed tax cut on dividends, declining yields and companies' increasing use of stock buybacks.

'Collect, Reinvest, Repeat for Decades,' *Wall Street Journal*, 9 September 2011. This article discusses the view of investors toward dividends during a weak economic time period. Investors tend to flock toward stocks with dividends during economic downturn.

Answers to Concept Review Questions

1. A company's *payout policy* refers to its choice of whether to pay out cash to shareholders, in what fashion, and in what amount. The most obvious and important aspect of this policy is the firm's decision whether to pay a cash dividend, how large the cash dividend should be, and how frequently it should be distributed. In a broader sense, dividend policy also encompasses decisions such as whether to distribute cash to investors via share repurchases or specially designated dividends rather than regular dividends, and whether to rely on shares rather than cash distributions. Non-traditional forms of dividend payments, especially share repurchases are much more commonly used today, and so the dividend decision is much more complex and difficult than in the past. Also, there are many more important categories of shareholders who must be satisfied today – especially institutional investors – whereas managers once merely had to satisfy individual shareholders.

2. The firm has removed an amount of cash equal to the amount of the dividend from the firm. Its total assets have declined, so its market capitalisation and, in turn, the share price should decline by this amount as well.

A bonus share issue is an issue of shares to all shareholders as a dividend (possibly instead of, or in conjunction with, a cash dividend). The share price will decrease to maintain the same market capitalisation (share price \times number of shares) that existed prior to the bonus share issue. A share split redefines the share price and the number of shares outstanding (e.g. a 2 for 1 split takes 100 shares trading for \$40.00 and redefines it as 200 shares at \$20.00). Again, the market capitalisation of the firm is not changed, however, the goal of a share split is to lower the share price to a preferred level and the newly created additional shares are not considered a dividend or payout from the firm.

3. Share repurchases are an alternative to cash dividends because both have the same effect on the shareholders as a whole. With a cash dividend, the share price decreases by the amount of the per share dividend making all shares in total reduce in value by the entire amount paid in dividends. With a share repurchase, the share price does not decrease, but the number of shares owned by shareholders as a whole decreases by the amount of the shares repurchased. Shares maintain the same price, but there are fewer shares outstanding as a result. In both cases, assuming equivalent cash disbursements under either policy, shareholders as a whole receive cash and have the total value of the shares reduced by the same amount as the cash disbursed. From a tax perspective, currently, receiving a cash dividend or an equivalent amount of cash from a repurchase (considered a capital gain) has the same effect. However, with a share repurchase, the shareholder can choose to not participate and delay recognising the capital gain and associated tax to a future period when the shares are eventually sold.
4. Dividends are not viewed as a discretionary payout, but as a commitment to distribute cash. Managers will use external funding for a project before considering cutting a dividend to fund a project. Further, managers are wary to change a dividend so as not to change the nature of the commitment to shareholders. Share repurchases are viewed as discretionary and can be scaled back or increased with little effect. Consequently, a share repurchase program can be scaled back to move funds to a project rather than having to seek external funding for the project. It is this 'discretionary' view of share repurchasing that gives it an advantage over paying dividends.
5. It is certainly possible that some investors value a steady dividend stream. However, investors who desire steady cash flow from their share portfolio can achieve that objective by selling a few shares periodically. Selling shares is a substitute for receiving dividends. If investors value dividends, there must be something special about dividends that are important beyond the fact that dividends are steady. For instance, perhaps a steady dividend provides investors with a signal about the firm's financial strength and future profitability.
6. From 1950 until 1983, US firms generally paid 1/3 of their earnings in dividends and generally adjusted dividends within three years if dividend payouts deviated from the desired target. More recently (1984–2002), US firms have lowered dividend payouts to 20% of earnings and take much longer to adjust dividends (i.e. increased dividend smoothing). It is believed that the emergence of share repurchasing programs has encouraged this behaviour because share repurchasing allows for more flexibility distributing cash to shareholders.
7. Shareholders could unwind the firm's dividend policy in two ways. First, suppose shareholders preferred that the company reinvest dividends rather than paying them out. Shareholders could simply reinvest their dividends on their own, buying more shares. Alternatively, suppose shareholders preferred a higher dividend payout. They could generate homemade dividends by selling a few shares periodically.

8. These firms could also conduct a share repurchase, which would give a similar signal to the market if done with cash.
9. As long as the firm accepts all positive NPV investment opportunities and has 'costless' access to capital markets, then it can pay whatever dividends it desires. But if a firm pays out its dividends, then it will have to issue new shares to raise cash for ongoing investments. So it can either retain profits or pay dividends. In either way, the cash flows determine the shareholder's returns – not dividends.
10. In cases where shareholders generally face higher personal income tax rates applicable to dividends than capital gains tax rates applicable to share sales, there is an incentive for the company to return capital to shareholders via share repurchase programs.
11. The signalling and agency theories both support the empirical evidence because the market interprets the decline in dividends that (a) the firm is not doing well and must not be worth its current market value, and (b) agency problems cannot be controlled by the dividend and that the managers are not working in the shareholders' best interest. Both are sending the market a negative signal.
12. Cash dividend payments have an inherent credibility that words do not have. Therefore, investors will be more willing to believe managers who say that their firms have great prospects when the managers back these statements up with high cash dividend payments than when the managers use words alone. In the language of accounting, dividends have 'cash validity.' There is some empirical support for the informational role of dividend payments, but it is far from overwhelming. In fact, recent research suggests that dividend payments may convey more information about the past (we are increasing dividends because we had a profitable quarter) rather than the future.
13. A company with weaker cash flows may temporarily be able to mimic a dividend increase undertaken by a firm with stronger cash flows, but in the long run its lesser cash position would catch up with it. If it is not generating sufficient internal funds to pay dividends, it will have to raise money by issuing new debt or equity. If it has weak cash flows, lenders will be reluctant to lend more money. If it has weak cash flows, its share price may be depressed, making the issuance of new equity costly.
14. According to the residual theory of dividends, the actual dividend amount paid out by a company to shareholders each quarter would be the amount of cash 'left over' after the firm's fixed payments had been paid in full and the company had financed new investments as desired from retained earnings. Dividends would then truly be a residual, what remains after all fixed charges and positive-NPV investments had been funded, and as such would be highly variable amounts from one quarter to the next. Contrary to this theory's predictions, cash dividend payments are extremely stable from quarter to quarter, so the theory is empirically refuted.

Answers to Self-Test Problems

ST15-1. What do *record date*, *ex-dividend date*, and *payment date* mean, related to dividends? Why would you expect the price of a share to drop by the amount of the dividend on the ex-dividend date? What rationale has been offered for why this does not actually occur?

A: When corporations announce dividend payments, they state that the dividend will be paid to shareholders of record on a certain date, with payment to be made several days later. This means the check will be made out to shareholders on the corporation's registry as of, say 5 July, with payment actually being made on 15 July. About four days before the

record date, the company's shares will trade ex dividend, meaning that someone who purchases a share before this ex dividend date will be recorded on the company's books before the record date and will receive the dividend payment. Someone who purchases a share on or after the ex dividend date will not receive the dividend payment (it will go to the previous owner), as there will be insufficient time to record the new owner on the shareholders' registry before payment is made. The share price should therefore drop by about the amount of the dividend payment on the ex-dividend date, because the new purchaser must be compensated for the fact that the upcoming cash payment will be made to the previous owner. Historically, the average price drop on the ex-dividend day for US companies has been 50-65% of the amount of the dividend paid, and this has been interpreted as a personal income tax effect. Since personal tax rates on dividend income have traditionally been taxed at a higher rate than on realised capital gains, most individual investors eager to sell shares would prefer to sell before the ex-dividend date – receiving their return as capital gains – rather than wait to receive the highly taxed cash dividend. For some expected ex-dividend day price drop investors will be indifferent between receiving \$1 worth of capital gains rather than \$0.50-\$0.65 worth of cash dividends.

In Australia, franking credits can mitigate or reduce this effect.

ST15-2. What does it mean to say that corporate managers 'smooth' cash dividend payments? Why do managers do this?

A: Most firms will maintain a constant nominal dividend payment until the company's managers are convinced that corporate earnings have permanently changed. If the firm's 'permanent earnings' increase, then managers will increase the nominal dividend payment a little each quarter or year until a new equilibrium level of dividend payments close to the target payout ratio is reached. The company will then maintain the quarterly or annual dividend at this nominal level until the firm's permanent earnings change again. This pattern of stable nominal dividend payments, followed by slow and steady increases as the firm's managers adjust to new levels of permanent earnings, gives the observed dividend series a smooth pattern, so managers are said to smooth dividends if they follow a constant nominal dividend payment policy with a partial adjustment strategy – as most do.

ST15-3. What are the key assumptions and predictions of the signalling model of dividends? Are these predictions supported by empirical research findings?

A: The signalling model of dividends predicts that managers will begin paying dividends in order to differentiate their 'strong' firms from weaker firms (with lower cash flows) in a market characterised by information asymmetries between managers and shareholders. In such an environment, investors cannot distinguish strong from weak companies, so managers of strong firms will incur all the costs (taxes, foregone investment, transactions costs of issuing new securities) of paying high dividends because their firms can afford to bear these costs while weaker firms cannot. Signalling with dividends is comparable to burning \$100 bills in public; only the wealthiest individuals can afford to commit such a wasteful act, so the signal is credible to all who witness it. The signalling model predicts that the most profitable and most promising firms will pay the highest dividends. The prediction that more profitable firms will pay the highest dividends is partially supported by empirical research, but the most promising firms (high-tech and entrepreneurial companies) have low payouts, which contradicts the signalling model's predictions.

ST15-4. What is the expected relationship between dividend payout levels and the growth rate and availability of positive-NPV projects, under the agency cost model of dividends?

What about the expected relationship between dividend payout and the diverseness of the company's shareholders? Consider a company such as Microsoft, awash in excess cash flow and available positive-NPV projects, and having a relatively diverse shareholder base in an industry with increasing competition. Does either the agency model or the signalling model adequately predict the dividend policy of Microsoft? Which does the better job?

- A:** The agency cost model predicts that companies with many positive-NPV investment projects will have less need to pay out cash as dividends in order to overcome agency costs than will firms with few positive-NPV projects. Thus high-growth firms will have low dividend payouts. Firms with a tight ownership structure have few agency problems between managers and shareholders, so have less need to make large dividend payments. Most economists agree that Microsoft should pay out more of its cash holdings (horde?) as dividends, and the firm recently has raised its payout level – though the current payments will not seriously reduce Microsoft's cash mountain in the foreseeable future.

Answers to End-of-Chapter Questions

- Q15-1.** What is a company's dividend yield? How does it compare to that company's dividend payout ratio?
- A15-1.** Dividend yield is computed by dividing the annual dividend per share by share price, whereas payout ratio is computed as cash dividend payments (in aggregate or per share) by the firm's net income (aggregate or per share).
- Q15-2.** Compare and contrast the following dividend policies: *constant payout ratio dividend policy* and the *constant dollar payout dividend policy*. Which policy do most public companies actually follow? Why?
- A15-2.** A firm pursuing a constant payout ratio dividend policy would pay a set fraction of its quarterly or annual profits out to shareholders as cash dividends every period, and the actual dividend payments per share would be as volatile as the underlying earnings. Firms pursuing a constant nominal dividend payment policy pay a set amount (say \$0.50 per share) every period for long stretches of time, regardless of variability in the level of quarterly or annual earnings per share – though these companies also have a rough target dividend payout ratio that they shoot for over time. These firms only change their dollar dividend payments when their managers are convinced that earnings have *permanently* changed, so the dividend series becomes by far the most stable of all the firm's cash inflows or outflows. They will then change dividends slowly so that the new nominal payment amount is closer to the desired dividend payout ratio (fraction of the firm's earnings paid out as dividends). The vast majority of the world's public companies that pay dividends regularly pursue a constant dollar dividend payment policy.
- Q15-3.** What is a *low-regular and extra dividend payout policy*? Why do firms pursuing this policy explicitly label some cash dividend payments as 'extra'?
- A15-3.** Firms with volatile earnings, or those that have received a one-time cash windfall (perhaps from an asset sale or a legal award) will often distribute some or all of this extra cash to shareholders in the form of a specially-labelled 'extra' dividend, in addition to the regular quarterly or annual cash dividend. By labelling the extra cash dividend as 'special,' the firm tells investors not to expect this to happen again, so the fact that it is not repeated the following quarter will not be interpreted as a dividend cut or omission.

Q15-4. What is a bonus share issue? How does this differ from a share split?

A15-4. A bonus share issue is a distribution of new shares to existing investors, usually instead of a cash dividend. Shareholders who originally owned say, 100 shares, might receive an extra five shares as bonus shares, giving them 105 shares in total. Since everyone receives the same proportional distribution, however, this 'dividend' has no real value and the firm's share price should decline by roughly the amount of the bonus shares issued (5% in the example above), leaving the overall market value of the firm's shares unchanged. In a two-for-one share split, the number of shares outstanding is doubled and every shareholder receives one new share for each they already owned. The firm's share price should fall by half (say from \$100 per share to \$50), though empirical evidence shows that it typically falls by less than half (perhaps only to \$52 per share). In a four-for-one split, the number of shares is quadrupled and each investor receives three new shares for each one they originally owned, so he or she owns four shares where previously they owned one. In this case, the share price should fall by three-fourths (from \$100 to \$25 per share), though again empirical evidence shows that the average fall is less than this (perhaps to \$26/share). Share splits and bonus share issues also differ in their accounting treatment, with the per share par value of the firm's shares being unaffected in the shareholders equity accounts after a bonus issue, but with par value being cut in half by a two-for-one share split. Companies usually split their stock once the price has increased out of a preferred target range, and the managers wish to reduce the per share price back to a level that will attract more individual investors.

Q15-5. What factors have contributed to the growth in share repurchase?

A15-5. In situations that have income tax rates that are higher than capital gains tax rates, investors may prefer to receive their investment returns in the form of capital gains than as cash dividends. Routine share repurchases have also helped propel share prices higher, since these programs removed a large fraction of existing shares from the market each year. Shareholders could also choose whether or not to participate in repurchase programs. Those who chose to sell their shares were liable for personal tax on their realised capital gains – but at a lower rate than on dividends – whereas those investors who chose not to sell their shares saw their fractional ownership in the firm increase, and escaped paying taxes altogether until they actually sold shares. Thus one probable explanation for the surge in share repurchases is that managers substituted these for cash dividend payments in order to minimise tax liabilities for their firms' shareholders.

However, recent research has indicated a much less value-maximising explanation for the rise in repurchase programs. This body of research indicates that managers implemented repurchase programs primarily to offset the enormous increase in shares outstanding that resulted from their own share option compensation programs. In other words, these option distributions were so large that managers had to repurchase shares in order to prevent a dramatic and dilutive increase in the number of shares outstanding.

Another factor has been the lack of value accretive investment opportunities for managers to pursue. When this is the case, returning capital to shareholders can provide a better return on equity.

Q15-6. What is the average share market reaction to: (a) a dividend initiation; (b) a dividend increase; (c) a dividend termination; and (d) a dividend decrease? Are these reactions logically consistent?

A15-6. The average share market reaction to a dividend initiation or increase is a 1-3% rise in stock price on the announcement date. When firms announce dividend cuts or

terminations, however, the market reaction is sharply negative. On average cuts are associated with a share price decline of around 25%, and terminations – though rare – lead to even larger share price declines. Since the reactions are symmetrical (good for an increase, bad for a decrease), they are internally consistent.

Q15-7. What are the key assumptions and predictions of the *agency cost/contracting model of dividend payments*? Are these predictions supported by research findings?

A15-7. The agency cost contracting model of dividend payments predicts that managers initiate dividend payments primarily to overcome the agency costs that arise once a publicly traded firm's ownership structure becomes diffuse. While ownership is tightly concentrated (when the firm is private or closely held but publicly traded), there is little divergence between ownership and control, so there are few agency problems to overcome. As ownership becomes dispersed, agency costs between managers and outside shareholders become increasingly important and managers begin paying dividends as a way to commit to paying out free cash flow rather than wasting it through excessive investment or consumption of 'perquisites.' These predictions are largely supported by empirical research, so the agency cost model is widely accepted as the best available explanation for observed dividend payment patterns.

Q15-8. Around the world, utilities generally have the highest dividend payouts of any industry, yet they also tend to have massive investment programs which they finance using external sources. How do you reconcile high payouts and large-scale security issuance?

A15-8. Regulated firms have a clear incentive to commit to paying out almost all of their net income each period, since if they did not regulators would find it easy to transfer wealth from shareholders to rate-payers by setting allowable rates very low. In this case, utilities would have to use net profits to cover their cost of providing service. If the utility commits to paying out its net income each period, regulators cannot force them to accept too low rates because this will force the utility into financial distress as they lose money on providing services. This need to pay out most or all of their cash flow, coupled with a utility's need to make large capital investments in new plant and equipment each period, is why one observes utilities routinely paying out high fractions of their profits while also selling large amounts of new securities each period.

Q15-9. Why do companies with diverse shareholder bases typically pay higher dividends than private firms or public firms with more-concentrated ownership structures? How are fixed dividends used as a bonding (commitment) mechanism by managers of firms with dispersed ownership structures and large amounts of excess cash flow?

A15-9. Firms with more diverse ownership most likely have higher agency costs. If a firm is closely held – in other words, the people running the firm are also its owners – then agency issues are not a severe problem. This is more difficult when a firm has a large, diverse body of shareholders. It is also more difficult for a large number of shareholders to monitor the firm. Therefore, there is more benefit to external monitoring of firms with large, diverse shareholders. Fixed dividends are a bonding mechanism – like debt payments, helping to demonstrate that the firm has steady cash flows and forcing management to work hard to maintain those cash flows.

Q15-10. How is the *residual theory of dividends* used to explain observed dividend payments? How is this theory in conflict with evidence suggesting that corporate managers smooth dividends?

- A15-10.** According to the residual theory of dividends, the actual dividend amount paid out by a firm to shareholders each quarter would be the amount of cash 'left over' after the firm's fixed payments had been paid in full and the firm had financed new investments as desired from retained earnings. Dividends would then truly be a residual, what remains after all fixed charges and positive-NPV investments had been funded, and as such would be highly variable amounts from one quarter to the next. Contrary to this theory's predictions, cash dividend payments are extremely stable from quarter to quarter, so the theory is empirically refuted.

Solutions to End-of-Chapter Problems

Payout Policy Fundamentals

- P15-1.** What are alternative ways in which investors can receive a cash return from their investment in the equity of a company? From a tax standpoint, which of these would be preferred, assuming that investors the same 30% tax rate on income and capital gains? What are the pros and cons of paying out cash dividends?
- A15-1.** Investors can receive cash returns from their equity investments from cash dividends or share repurchases. From a tax standpoint, shareholders would prefer the share repurchase if dividends are taxed more heavily than capital gains. They must only pay capital gains taxes on the amount of their capital gain – the amount they received for the repurchased share minus their basis in the shares (the amount they paid for the shares, including transactions costs). If dividends and capital gains face equal tax rates, investors would be indifferent between realised capital gains and dividends – though the option to not participate in share repurchases would still allow investors to defer payment of capital gains taxes until these were realised (the shares sold). The pros of paying cash dividends include: sending a signal that the company has sufficient cash flows to pay a dividend, becoming attractive to institutions who can only invest in firms that pay regular dividends, providing a 'certain' return to shareholders in a risky share market. The disadvantages of dividends include double taxation (on both the corporate and personal level), and higher transactions costs if paying the dividend means the firm will need to raise more external capital.
- However, in Australia, this issue might be mitigated by the presence of franking credits.
- P15-2.** Delta Corporation earned \$2.50 per share during fiscal year 2011 and paid cash dividends of \$1.00 per share. During the fiscal year that just ended on 30 June 2012, Delta earned \$3.00 per share, and the firm's managers expect to earn this amount per share during fiscal years 2013 and 2014 as well.
- What was Delta's payout ratio for fiscal year 2011?
 - If Delta's managers wish to follow a constant dollar payout dividend policy, what dividend per share will they declare for fiscal year 2012?
 - If Delta's managers wish to follow a constant payout ratio dividend policy, what dividend per share will they declare for fiscal year 2012?
 - If Delta's managers wish to follow a partial-adjustment strategy, with a target payout ratio equal to fiscal year 2011's, how could they change dividend payments during 2012, 2013, and 2014?
- A15-2.**
- Delta's payout ratio for 2011 was 40% ($\$1.00 \div \2.50)
 - The same as in 2011, \$1.00 per share.

- c. Delta's dividend payment in 2012 will be \$1.20 per share ($0.40 \times \$3.00/\text{share}$) under a constant payout ratio policy.
- d. Delta's managers might increase dividends from \$1.00 to \$1.06 in 2012, then from \$1.06 to \$1.13 in 2013 and finally to the long-term equilibrium level of \$1.20/share in 2014.

- P15-3.** Advanced Vehicle Enterprises (AVE) follows a policy of paying out 50% of its net income as cash dividends to its shareholders each year. The company plans to do so again this year, during which AVE earned \$100 million in net profits after tax. The company has 40 million shares outstanding and pays dividends annually.
- a. What is the company's dollar dividend payment per share each year?
 - b. Assuming that AVE's share price is \$54 per share immediately before its ex-dividend date, what is the expected price of AVE shares on the ex-dividend date if there are no personal taxes on dividend income received?

- A15-3.**
- a. AVE's nominal dividend payment per share is \$1.250/per share for the year. The total dividend payment, based on a 50% payout ratio, is \$50,000,000. This is dispersed to 40,000,000 shares once per year, so each share receives \$1.25.
 - b. AVE's share price should drop by the amount of the dividend payment (\$1.25/share) on the ex-dividend date, so it should fall from \$54/share to \$52.75/share.

- P15-4.** General Manufacturing Company (GMC) follows a policy of paying out 50% of its net income as cash dividends to its shareholders each year. The company plans to do so again this year, during which GMC earned \$100 million in net profits after tax. The company has 40 million shares outstanding and pays dividends annually. Assume that an investor purchased GMC shares a year ago at \$45 per share. The investor, who faces a personal tax rate of 15% on both dividend income and on capital gains, plans to sell the stock soon. Transactions costs are negligible.
- a. Calculate the after-tax return this investor will earn if she sells GMC shares at the current \$54 share price prior to the ex-dividend date.
 - b. Calculate the after-tax return the investor will earn if she sells GMC shares on the ex-dividend date, assuming that the price of GMC shares falls by the dividend amount on the ex-dividend date.
 - a. Calculate the after-tax return the investor will earn if she sells GMC shares on the ex-dividend date, assuming that the price of GMC shares falls by one-half the dividend amount on the ex-dividend date.

- A15-4.**
- a. If she purchased the shares for \$45/share one year ago and sells it for \$54/share prior to the ex-dividend date, she will earn a pre-tax profit of \$9.00/share, or a return of 20% ($\$9.00 \div \45) on her investment. She will have to pay \$1.35/share in tax ($0.15 \text{ tax rate} \times \$9.00/\text{share profit}$), leaving her with an after-tax profit of \$7.65/share, and an after-tax return of 17.0% ($\$7.65 \div \45).
 - b. If she sells on the ex-dividend day at the expected ex-day price of \$52.75/share, her return will come in two forms. She will receive a \$1.25/share dividend, and also earn a capital gain of \$7.75/share ($\$52.75/\text{share} - \$45/\text{share}$), so her total pre-tax return will be \$9.00/share, or 20% if expressed as a percentage return. She would then pay personal tax at a 15% rate on both dividends and realised capital gains. Her after-tax return is 17% ($\$7.65/\45).
 - c. If she sells on the ex-dividend day and the share price only declines by one-half (\$0.625) the dividend amount, her return will still come in two forms. She will receive

\$1.25/share dividend, and also earn a capital gain of \$8.375 (\$53.375 – \$45). Her total pre-tax return will be \$9.625/share or 21.4%. Her after-tax return is $18.18\% = (\$9.625/\$45)(1 - 0.15)$.

P15-5. Specialty Chemicals Company (SCC) pays out 50% of its net income as cash dividends to its shareholders once each quarter. The company plans to do so again this year, during which SCC earned \$100 million in net profits after tax. If the company has 40 million shares outstanding and pays dividends quarterly, what is the company's dollar dividend payment per share each quarter?

A15-5. SCC's dollar dividend payment per share is \$0.3125/share each quarter, or \$1.250/per share for the year. The total dividend payment, based on a 50% payout ratio, is \$50,000,000. This is dispersed to 40,000,000 shares (\$1.25 per share per year) in four equal quarterly dividends of \$0.3125 per share per quarter.

P15-6. Twilight Company's shares are selling for \$60.25 per share, and the firm's managers have just announced a \$1.50 per share dividend payment.

- What should happen to Twilight Company's share price on the ex-dividend date, assuming that investors do not have to pay taxes on dividends or capital gains and do not incur any transactions costs in trading shares?
- What should happen to Twilight Company's share price on the ex-dividend date, assuming that it follows the historical performance of US stock prices on ex-dividend days and is not subject to the Australian dividend imputation system?

A15-6.

- If there are no taxes or transactions costs, Twilight's shares should decline by the exact amount (\$1.50/share) of the dividend on the ex-dividend date, from \$60.25 to \$58.75/share.
- Historically, US share prices fall by 50-65% of the dividend amount on the ex date. If we assume that Twilight's shares falls by, say, 60% of the dividend, or by \$0.90/share ($\1.50×0.6), then the shares would decline from \$60.25 to \$59.35/share on the ex-dividend day.

P15-7. Global Financial Corporation (GFC) has 10 million shares outstanding, each currently worth \$80 per share. The company's managers are considering a plan to split the company's shares 2-for-1, but they are concerned about the impact this split announcement will have on the company's share price.

- If GFC's managers announce a 2-for-1 share split, what exactly will the company do and what will GFC's share price likely be after the split?
- How many total shares of GFC will be outstanding after the share split?
- If GFC's managers believe that the 'ideal' share price for the firm's shares is \$20 per share, what should they do? How many shares would be outstanding after this action?
- Why do you think GFC's managers are considering a share split?

A15-7.

- If the two-for-one split is approved, GFC will distribute 10 million new shares to shareholders, and each investor will receive one new share for each one they already own. The share price should fall roughly in half, to about \$40/share.
- There will be 20 million shares outstanding after the split.
- GFC's managers should implement a four-for-one share split to bring GFC's share price down to around \$20/share. This would involve quadrupling the number of

shares outstanding by distributing 30 million new shares (three new share for each one held) to shareholders.

- d. Managers typically adopt share splits in order to reduce the share price down to a range that would attract more individual investors.

P15-8. The net income for a company is currently \$1,000,000 and is projected to grow annually for the next four years as follows: \$1,200,000, \$1,300,000, \$1,500,000, and \$1,700,000. Assuming the dividend payout ratio is 20% and there are 1,000,000 shares outstanding, what is the current dividend per share? Further assuming that the company does not change its stated dividend, what is the dividend payout ratio for the next four years? (Note: All figures are in thousands.)

A15-8. The current dividend per share is: $20\% \times \$1,000,000 \div 1,000,000 = \$200,000 \div 1,000,000$ shares = \$0.20/share.

Year 1 payout ratio: $\$200,000 \div \$1,200,000 = 16.67\%$

Year 2 payout ratio: $\$200,000 \div \$1,300,000 = 15.38\%$

Year 3 payout ratio: $\$200,000 \div \$1,500,000 = 13.33\%$

Year 4 payout ratio: $\$200,000 \div \$1,700,000 = 11.76\%$

P15-9. A company's shares currently sell for \$32.48, with 5 million shares outstanding. The company is considering a 20% bonus share issue, in which 100 shares become 120 shares. After the bonus share issue, at what price will the shareholders' value be unchanged? (Hint: Consider shareholder value to be the market capitalisation, which equals the number of shares outstanding multiplied by the share price.) If the stock price became \$27.50 after the bonus share issue, do the shareholders benefit?

A15-9. The price that keeps shareholder value unchanged is: $(\$32.48 \times 5 \text{ million shares}) \div (5 \text{ million shares} \times \{1 + 20\%\}) = \27.07 . A price of \$27.50 would indicate that shareholder value has increased because it is in excess of \$27.07.

P15-10. A company's shares currently sell for \$3.50 with 4 million shares outstanding. The company plans to reverse split its shares by combining two shares into one share. If the price after this reverse split is \$6.52, have shareholders gained or lost value? How much value is gained or lost? (Hint: Consider shareholder value to be the market capitalisation, which equals the number of shares outstanding multiplied by the share price.)

A15-10. Market capitalisation prior to split: $\$3.50 \times 4 \text{ million shares} = \14 million

Market capitalisation after the split: $\$6.52 \times 2 \text{ million shares} = \13.04 million

The reverse split loses \$960,000.00 (\$14 million – \$13.04 million) in shareholder value.

P15-11. Sunshine Pageants decides that it will use a Dutch auction to repurchase 2 million shares. Investors have submitted the following bids on the price and quantity they are willing to sell shares to the firm:

Price (\$)	Shares
24.45	100,000
24.50	200,000
24.60	600,000
24.75	1,100,000
24.95	2,000,000
25.15	2,500,000

Price (\$)	Shares
25.50	5,000,000

Determine the lowest price at which the company is able to purchase 2 million shares.
(Note: If the firm is willing to purchase shares for \$25.50, then it must purchase all shares at this price; the goal is to find the lowest price at which the company can purchase the 2 million shares.) Given the purchase price of the shares, how much extra money do the shareholders receive compared to the schedule of acceptable bids?

- A15-11.** At a price of \$24.75, 2 million shares can be purchased according to the schedule. 1,100,000 shares will receive the \$24.75 price as per the price in the schedule. 600,000 shares will receive \$0.15 (\$24.75 – \$24.60) above the schedule price (\$90,000.00 total). 200,000 shares receive \$0.25 (\$24.75 – \$24.50) above the schedule price (\$50,000.00 total). 100,000 shares receive \$0.30 (\$24.75 – \$24.45) above the schedule price (\$30,000.00 total). Overall, \$170,000.00 has been paid in excess of the schedule prices.
- P15-12.** Investor A recognises \$100 in dividend income that is taxed at a rate of 20%. Investor B also wants to recognise the same after-tax revenue as investor A, but investor B owns shares that do not pay dividends. If investor B's shares sell for \$12 a share (originally purchased for \$7 a share) and if the capital gains tax is 40%, then how many shares must investor B sell?
- A15-12.** Investor A's after-tax profit on dividends: $\$100.00 \times (1 - 20\%) = \80.00
Investor B's after-tax cash flow per share is: $\$7.00 + (\$12.00 - \$7.00) \times (1 - 40\%) = \10.00 .
Notice, only the capital gain portion is taxable. Consequently, Investor B will need to sell eight shares ($\$80.00 \div \10.00) to have the same after-tax profit as Investor A.
- P15-13.** Maggie Fiduciary is a shareholder in the Superior Service Company (SSC). The current price of SSC's shares is \$33 per share, and there are 1 million shares outstanding. Maggie owns 10,000 shares, or 1% of the equity, which she purchased one year ago for \$30 per share. Assume that SSC makes a surprise announcement that it plans to repurchase 100,000 shares of its own shares at a price of \$35 per share. In response to this announcement, SSC's share price increases \$1 per share, from \$33 to \$34, but this price is expected to fall back to \$33.50 per share after the repurchase is completed. Assume that Maggie faces marginal personal tax rates of 15% on both dividend income and capital gains.
- Calculate Maggie's (realised) after-tax return from her investment in SSC shares, assuming that she chooses to participate in the repurchase program and all of the shares she tenders are purchased at \$35 per share.
 - How many shares will Maggie be able to sell if all SSC's shareholders tender their shares to the company as part of this repurchase program and the company purchases shares on a pro rata basis?
 - What fraction of SSC's total ordinary equity will Maggie own after the repurchase program is completed if she chooses not to tender her shares?
- A15-13.**
- If Maggie is able to sell all of her shares for \$35/share, she would earn a pre-tax profit of \$5.00/share (\$35/share sale price – \$30/share purchase price), or a pre-tax return of 16.67% (\$5.00 profit ÷ \$30 purchase price). If she must pay a 15% tax, this would reduce her per share profit by \$0.75/share ($0.15 \times \$5.00/\text{share}$), to \$4.25/share and her after-tax return to 14.17%.
 - If all SSC shareholder tender their shares in the offering, and the company does not increase its tender offer past 100,000 shares – equal to 10% of the total number of shares outstanding – then the company will purchase a proportional 10% of each

investor's shares tendered. So SSC would purchase 1,000 of the shares Maggie tendered.

- c. Maggie will own 1.11% of SSC's ordinary equity (10,000 shares owned \div 900,000 outstanding) after the tender offer if she retains all her shares.

P15-14. Go to the home page for Dogs of the Dow (<http://www.dogsofthedow.com>), look at the year-to-date figures, and observe the dividend yields of the thirty shares of the Dow Jones Industrial Average. Which industries contain the higher-dividend-yielding stocks, and which contain the lower-yielding shares? Are there differences in the growth prospects between the high- and low-yielding shares? Is this what you expected? Explain.

A15-14. This is an internet problem, so we cannot predict exact answer ahead of time. However, the basic findings should be that slowly growing and asset rich companies (e.g., transportation, real estate) and regulated firms will have high dividend payouts and yields, while rapidly growing high-tech and service companies will have low payouts and yields.

P15-15. Stately Building Company's shares are selling for \$75 each and its dividend yield is 2.0%. What is the amount of Stately's dividend per share?

A15-15. Since dividend yield is computed as dividend amount divided by share price (yield = $\$div \div price$), we can use the yield and share price to determine the dividend amount. Since yield = 0.02 and price = \$75/share, the dividend amount = \$1.50/share ($0.02 \times \75).

P15-16. The shares of Up-and-Away Pty Ltd. are selling for \$80 per share and are currently paying a quarterly dividend of \$0.25 per share. What is the dividend yield on Up-and-Away shares?

A15-16. Our first step is to calculate the annual dividend amount, since yield is calculated as annual dividend divided by price. Thus we find that the annual dividend is \$1.00/share ($\$0.25/\text{quarter} \times 4 \text{ quarters/year}$). Then, the dividend yield is computed as 1.25% ($\$1.00 \div \$80.00/\text{share}$).

P15-17. Well-Bred Service Company earned \$50,000,000 during 2012 and paid \$20,000,000 in dividends to the holders of its 40 million shares. If the current market price of Well-Bred's shares is \$31.25, calculate the following: (a) the company's dividend payout ratio; (b) the stated dividend per share, assuming Well-Bred pays dividends annually; (c) the stated dividend per share, assuming Well-Bred pays dividends in four equal quarterly payments; and (d) the current dividend yield on Well-Bred shares.

- A15-17.**
- Payout ratio is computed as the dividend paid divided by the firm's net income, either for the firm as a whole or on a per share basis. Since we know total dividends are \$20 million and net income is \$50 million, it is easiest to calculate for the firm. Well-Bred's payout ratio is 40% ($\$20 \text{ million dividends} \div \$50 \text{ million net profits}$).
 - If dividends are paid annually, the dividend will be \$0.50/share ($\$20 \text{ million dividends} \div 40 \text{ million shares outstanding}$).
 - If dividends are paid quarterly, the dividend will be \$0.125/share ($\$0.50/\text{share} \div 4 \text{ quarters}$).
 - The current yield is 1.60% ($\$0.50 \text{ annual dividend/share} \div \$31.25 \text{ price/share}$).

Dividends in Perfect and Imperfect Worlds

P15-18. It is 1 January 2013, and Boomer Equipment Company (BEC) currently has assets of \$250 million and expects to earn a 10% return on assets during the 2013. There are 20 million shares of BEC stock outstanding. The company has an opportunity to invest in a (minimally) positive-NPV project that will cost \$25 million over the course of 2013, and is trying to determine if it should finance this investment by retaining profits over the course of the year or by issuing new shares while paying the profits earned as dividends. Show that the decision is irrelevant in a world of perfect and frictionless markets.

A15-18. There are currently 20 million BEC shares outstanding with a market price of \$12.50/share (\$250 million assets ÷ 20 million shares). If the company retains its profits during 2013 and re-invests these in the new project, the total market value of BEC at year-end 2013 will be \$275 million (\$250 million + \$25 million retained profits + project NPV [assumed negligible]) and the per share price will be \$13.75/share (\$275 million ÷ 20 million shares), and investors will have earned a 10% return on their investment during 2013.

Now assume that BEC decides instead to pay out its \$25 million in profits as dividends (\$1.25/share) during 2012, and to fund the \$25 million investment project by issuing new stock. Since the current stock price is \$12.50/share, BEC would need to sell 2 million new shares to raise \$25 million. After this sale, there will be 22 million BEC shares outstanding (the original 20 million + 2 million newly-issued shares) and the total market value of BEC at year-end 2012 will be \$275 million (\$250 million initial value + \$25 million in proceeds from new shares issued + project NPV [assumed negligible]). Each outstanding share will have a value of \$12.50/share at year-end 2013 (\$275 million ÷ 22 million shares) and the original shareholders will have earned a 10% return on their investment during 2012, all in the form of dividends received (\$1.25/share dividend ÷ \$12.50/share initial share price).

This shows that dividend policy will be irrelevant for BEC under the assumption of no taxes or transactions costs, because the firm will have the same overall market value at year-end 2013 and investors will earn the same return regardless of whether the company retains all of its earnings or pays out the earnings as dividends and issues new shares.

P15-19. Swelter Manufacturing Company (SMC) currently has assets of \$200 million and a required return of 10% on its 10 million shares outstanding. The company has an opportunity to invest in minimally positive NPV projects that will cost \$20 million, and is trying to determine if it should withhold this amount from dividends payable to finance the investments or pay out the dividends and issue new shares to finance the investments. Show that the decision is irrelevant in a world of perfect and frictionless markets. How is the result affected if a personal income tax of 15% is introduced into the model?

A15-19. There are currently 10 million SMC shares outstanding with a market price of \$20.00/share (\$200 million assets ÷ 10 million shares). If the company retains its profits during the coming year and re-invests these in the new project, the total market value of SMC at year-end will be \$220 million (\$200 million + \$20 million retained profits + project NPV [assumed negligible]), the per share price will be \$22.00/share (\$220 million ÷ 10 million shares), and investors will have earned a 10% return on their investment.

Now assume that SMC decides instead to pay out its \$20 million in profits as dividends (\$2.00/share), and to fund the \$20 million investment project by issuing new stock. Since the current share price is \$20.00/share, SMC would need to sell 1 million new shares to raise \$20 million. After this sale, there will be 11 million SMC shares outstanding (the original 10 million + 1 million newly-issued shares) and the total market value of SMC at year-end will be \$220 million (\$200 million initial value + \$20 million in

proceeds from new shares issued + project NPV [assumed negligible]). Each outstanding share will have a value of \$20.00/share at year-end ($\$220 \text{ million} \div 11 \text{ million shares}$) and the original shareholders will have earned a 10% return on their investment during the year, all in the form of dividends received ($\$2.00/\text{share dividend} \div \$20.00/\text{share initial share price}$).

This shows that dividend policy will be irrelevant for SMC under the assumption of no taxes or transactions costs, because the firm will have the same overall market value at year-end and investors will earn the same return regardless of whether the company retains all of its earnings or pays out the earnings as dividends and issues new shares.

If income from dividends is taxed at a 15% rate, but capital gains remain untaxed, then dividend policy ceases to be irrelevant. In this case, Swelter's shareholders would receive after-tax dividends of only \$1.70/share [$\$2.00 \times (1 - 0.15)$] rather than \$2.00/share and an investor's after-tax return would be reduced from 10% to only 8.50% ($\$1.70 \div \$20.00 \text{ initial share price}$). With such a tax structure, Swelter would create more value for shareholders by retaining profits and using these to finance new investments, as in the original example, rather than paying dividends and selling new shares.

P15-20. Assume it is now 1 January 2013, and you are examining two unlevered firms that operate in the same industry that have identical assets worth \$80 million that yield a net profit of 12.5% per year, and that have 10 million shares outstanding. During 2013 and all subsequent years, each firm has the opportunity to invest an amount equal to its net income in (slightly) positive-NPV investment projects. The Beta Company wants to finance its capital spending through retained earnings. The Gamma Company wants to pay out 100% of its annual earnings as cash dividends and to finance its investments with a new share offering each year. There are no taxes or transactions costs to issuing securities.

- a. Calculate the overall and per-share market value of the Beta Company at the end of 2013 and each of the two following years (2014 and 2015). What return on investment will this firm's shareholders earn?
- b. Describe the specific steps that the Gamma Company must take today (1/1/2013) and at the end of each of the next three years (year-end 2013, 2014, and 2015) if it pays out all of its net income as dividends and still grows its assets at the same rate as that of the Beta Company.
- c. Calculate the number and per-share price of shares that the Gamma Company must sell today, and at the end of 2013, 2014, and 2015, if it pays out all of its net income as dividends and still grow its assets at the same rate as that of the Beta Company.
- c. Assuming that you currently own 100,000 shares (1%) of Gamma Company, compute the fraction of the company's total outstanding equity that you will own three years from now if you do not participate in any of the share offerings the firm will make during this holding period.

A15-20. a. Currently, Beta has assets worth \$80 million and 10 million of its shares are outstanding, so each is now worth \$8.00/share. By the end of 2013, Beta's assets will grow to \$90 million, reflecting \$10 million in retained profits ($0.125 \times \$80 \text{ million}$). Because the number of shares outstanding does not change, Beta will still have 10 million shares at year-end 2013, each of which will be worth \$9.00/share ($\$90 \text{ million market value of assets} \div 10 \text{ million shares}$). This represents an investment return of 12.5% for Beta's shareholders ($\$1.00/\text{share price appreciation} \div \$8.00/\text{share original price}$).

Each year Beta earns 12.5% of its assets and reinvests this in the company by financing the new investment projects that arise. The summary below shows Beta Company's market capitalisation and per share price, as well as the return earned by Beta Company shareholders, at year-end 2014 and 2015:

12/31/2014:

Market cap = \$90 million \times 1.125 = \$101.25 million

Share price = \$101.25 million \div 10 million shares = \$10.125/share

Return during 2014 = $(\$10.125 - \$9.00) \div \$9.00/\text{share initially} = 12.5\%$

12/31/2015:

Market cap = \$101.25 million \times 1.125 = \$113.91 million

Share price = \$113.91 million \div 10 million shares = \$11.391/share

Return during 2015 = $(\$11.391 - \$10.125) \div \$10.125/\text{share initially} = 12.5\%$

- b. Gamma is currently (1/1/2013) in the same position as Beta. It has assets of worth \$80 million and 10 million of its shares are outstanding, so each is now worth \$8.00/share. It will generate \$10 million in profits ($0.125 \times \80 million) during 2013 but, unlike Beta, Gamma plans to distribute all of these profits to shareholders as dividends, at the rate of \$1.00/share, and issue a sufficient number of new shares to raise the \$10 million needed for investment during 2013. Gamma will repeat this process each year, paying out all earnings as dividends and issuing new shares in sufficient number to finance new investments.

- c. During 2013, Gamma will pay out all its \$10 million in earnings as dividends (\$1.00/share) and will need to issue enough shares at the current stock price of \$8.00/share to fund the \$10 million investment it will make during the year. Thus it must issue 1.25 million new shares during 2013. At year-end, Gamma will have assets worth \$90 million (\$80 million initial value + \$10 million investment + project NPV [assumed negligible]) and 11.25 million shares outstanding. Each share will be worth \$8.00, and the original shareholders will earn a 12.5% return on their shares during 2013, all in the form of dividends ($\$1.00/\text{share dividend} \div \$8.00/\text{share initial market price}$).

During 2014, Gamma will pay out all its \$11.25 million in earnings ($0.125 \times \$90$ million initial asset value) as dividends (\$1.00/share) and will thus need to issue enough shares at the continuing stock price of \$8.00/share to fund the \$11.25 million investment it will make during the year. Thus it must issue 1.4063 million new shares ($\$11.25 \text{ million} \div \$8.00/\text{share}$) during 2014. At year-end, Gamma will have assets worth \$101.25 million (\$90 million initial value + \$11.25 million investment + project NPV [assumed negligible]) and 12.6563 million shares outstanding (11.25 million shares at year-end 2013 + 1.4063 million issued during 2014). Each share will be worth \$8.00, and all shareholders will earn a 12.5% return on their shares during 2014, all in the form of dividends ($\$1.00/\text{share dividend} \div \$8.00/\text{share initial market price}$).

During 2015, Gamma will pay out all its \$12.656 million in earnings ($0.125 \times \$101.25$ million initial asset value) as dividends (\$1.00/share) and will thus need to issue enough shares at the continuing share price of \$8.00/share to fund the \$12.656 million investment it will make during the year. Thus it must issue 1.582 million new shares ($\$12.656 \text{ million} \div \$8.00/\text{share}$) during 2015. At year-end, Gamma will have assets worth \$113.906 million (\$101.25 million initial value + \$12.656 million investment + project NPV [assumed negligible]) and 14.2383 million shares outstanding (12.6563 million shares at year-end 2014 + 1.582 million issued during 2015). Each share will be worth \$8.00, and all shareholders will earn a 12.5% return on their shares during 2015, all in the form of dividends ($\$1.00/\text{share dividend} \div \$8.00/\text{share initial market price}$).

- d. If you own 100,000 shares (1%) of Gamma's shares in early 2013, and do not purchase any of the new shares issued during 2013, 2014, or 2015, you will own 0.702% of the 14.2383 million shares outstanding at year-end 2015.

- P15-21.** Investors anticipate that Sweetwater Manufacturing's next dividend, due in one year, will be \$4 per share. Investors also expect earnings to grow at 5% in perpetuity, and they require a return of 10% on their shares. Use the Gordon growth model (see Equation 5.4) to calculate Sweetwater's share price today.
- A15-21.** The Gordon Growth Model determines the current price of a share (P_0) by dividing the expected dividend per share next period (DIV_1) by the difference between the required return on the stock (r) and the growth rate (g), so $P_0 = DIV_1 \div (r - g)$. Since $DIV_1 = \$4.00/\text{share}$, $r = 0.10$ and $g = 0.05$, Sweetwater's share price should be \$80/share [$P_0 = \$4.00 \div (0.10 - 0.05)$].
- P15-22.** Super-Thrift Pharmaceuticals Company traditionally pays an annual dividend equal to 50% of its earnings. Earnings this year are \$30,000,000. The company has 15 million shares outstanding. Investors expect earnings to grow at a 5% annual rate in perpetuity, and they require a return of 12% on their shares.
- What is Super-Thrift's current dividend per share? What is it expected to be next year?
 - Use the Gordon growth model (see Equation 5.4) to calculate Super-Thrift's share price today.
- A15-22.**
- Super-Thrift currently pays \$15,000,000 in dividends (\$30 million profits \times 0.50 payout ratio), or \$1.00/share to each of the 15 million shares. Earnings next year are expected to reach \$31.5 million, so if it pays out half of these profits as dividends that will be \$15.75 million or \$1.05/share.
 - Since $DIV_1 = \$1.05/\text{share}$, $r = 0.12$ and $g = 0.05$, Super-Thrift's share price should be \$15/share [$P_0 = \$1.05 \div (0.12 - 0.05)$].
- P15-23.** Casual Construction Corporation (CCC) earned \$60,000,000 during 2012. The company expects to earn \$63,000,000 during 2013, in line with its long-term earnings growth rate. There are 20 million CCC shares outstanding, and the company has a policy of paying out 40% of its earnings as cash dividends. Investors require a 10% return on CCC shares.
- What is CCC's current dividend per share? What is it expected to be next year?
 - Use the Gordon growth model (see Equation 5.4) to calculate CCC's share price today.
- A15-23.**
- Since CCC pays out 40% of its earnings as dividends, total dividends for 2012 are \$24 million ($0.40 \times \60 million profits), or \$1.20/share for each of the 20 million shares. Next year, total dividends should be \$25.2 million ($0.40 \times \63 million), or \$1.26/share.
 - The growth rate (g) in earnings implied by the increase from \$60 million to \$63 million profits next year is 5.0%. Since $DIV_1 = \$1.26/\text{share}$, $r = 0.10$ and $g = 0.05$, CCC's share price should be \$25.20/share [$P_0 = \$1.26 \div (0.10 - 0.05)$].
- P15-24.** Hole Foods Donuts has generated profits of \$2 per share for many years and has consistently paid 100% of those profits to shareholders via a dividend. Investors do not expect Hole Foods Donuts to grow in the future. The company has 200,000 shares outstanding worth \$20 per share. Suppose the company decides to eliminate its dividend and instead use the money to repurchase shares.
- Assuming that there are no taxes and that the repurchase announcement conveys no new information to investors about the profitability or risk of Hole Foods Donuts, how do you think the share price will react to the announcement?

- b. How many shares will Hole Foods Donuts repurchase?
- c. What stock price would you expect for Hole Foods Donuts one and two years after this announcement? What would the share price have been in the next two years if the company had simply maintained its old dividend policy?

A15-24. a. The share price should not react to the announcement.

- b. The current value of the firm is \$20 per share. With 200,000 shares outstanding, this results in a current market value of \$4,000,000.

The current dividend is \$2 per share on 200,000 shares for a total of \$400,000. If the company uses the \$400,000 to repurchase the shares at the current market price of \$20 per share, they can repurchase a total of $\$400,000 / \$20 \text{ per share} = 20,000$ shares.

After the repurchase, there will be 180,000 shares outstanding ($200,000 - 20,000 = 180,000$). After the repurchase, the total value of the firm will fall by the \$400,000 used in the repurchase, for a new market value of \$3,600,000. With 180,000 shares outstanding after the repurchase, the share price will be $\$3,600,000 / 180,000 \text{ shares} = \20 per share.

- c. Under the old dividend policy, the share price would remain at its current value forever. Notice that investors earn a 10% rate of return because they receive a \$2 dividend on a \$20 share each year. If the dividends are suspended indefinitely and shares are only repurchased in the current year (all future earnings are retained and reinvested in the firm), the price must appreciate 10% each year, to provide the same rate of return, so the price will increase over time from \$20, to \$22, to \$24.20, to \$26.62, and so on.

P15-25. Jasper Metals Pty. Ltd. just announced that it will pay its regular quarterly dividend of \$3.50 per share.

- a. Does the share price fall to reflect this payment on the announcement date, the record date, the ex-dividend date, or the payment date?
- b. Assume that there are no market imperfections. By how much will the share price fall?
- c. Suppose investors must pay a 38% tax on dividends received but pay nothing on capital gains. How would this change your answer to part (b)?
- d. Now suppose that investors must pay 38% in taxes on both dividends and capital gains. In this case, how much would you expect the share price to fall in response to the dividend?
- e. Suppose that, just prior to the dividend announcement, Jasper Metals shares were worth \$175 per share. Assume once again that there are no taxes. If you own 50 shares, then what is the value of your investment? How does the dividend payment affect your wealth? If Jasper Metals cancels the dividend and announces that they will repurchase 2% of their outstanding shares, what effect does that have on your wealth?

A15-25. a. The ex-dividend date.

- b. \$3.50

c. The share price would fall by $\$3.50(1 - 0.38) = \2.17 . Thus the magnitude of the after-tax dividend, and when the price drops by this amount, the after-tax return on dividends and capital gains is the same.

d. In this case the after-tax rate of return on dividends equals that of capital gains, so the share price should fall by the full \$3.50. To see this, consider what would happen if you bought the shares right before the dividend is paid and sold them immediately afterward. Because you are holding the shares for a very brief period of time, your rate of return on

that investment should essentially be zero. You buy the shares for $\$P_{old}$, immediately receive the \$3.50 dividend less 38% in taxes, and sell the shares for $\$P_{new}$. If $\$P_{old}$ and $\$P_{new}$ are different, then you pay taxes on 38% of any gain (or receive a tax credit of 38% of any losses). If the profit on this investment is zero, then $-\$P_{old} + (\$3.50 - (0.38)(\$3.50)) + \$P_{new} - 0.38(\$P_{new} - \$P_{old}) = 0$.

Solving this equation we find that the new share price is less than the old one by exactly \$3.50.

$$-\$3.50 + \$P_{old} = \$P_{new}$$

e. Your wealth is $50 \times \$175$ or \$8,750. After the dividend, you gain \$3.50 per share, but the share price drops by \$3.50, so your net wealth is unchanged. If the firm announces that it will repurchase 2% of its outstanding shares rather than paying a 2% dividend, then this also has no effect on your wealth. Jasper will repurchase 2% of your shares (that's 1 share) at \$175 per share, so you will receive \$175.

P15-26. Go to the home page of Cisco Systems, Inc. (<http://www.cisco.com>) and link to its investor relations area. Download the most recent annual report and observe the capital investment and dividend policies of Cisco Systems. Now, do the same for Chevron (<http://www.chevron.com>). Which of the two companies appears to have more high-growth, positive-NPV investment opportunities? Which pays the higher relative dividend? Do these results support the agency cost/contracting model? Do these results support the signalling model?

A15-26. Internet problem, so cannot predict exact answer ahead of time. However, Cisco will almost certainly be a higher-growth company and have more positive-NPV investment opportunities than Chevron, and will also pay lower dividends (Cisco currently pays no dividends). These results offer strong support for the agency cost model, but little support for the signalling model.

Real-World Influences on Payout Policy

P15-27. Universal Windmill Company (UWC) currently has assets worth \$50 million and a required return of 10% on its 2 million shares outstanding. The company has an opportunity to invest in (minimally) positive NPV projects that will cost \$5 million. UWC needs to determine whether it should withhold this amount from dividends payable to finance the investments or pay out the dividends and issue new shares to finance the investments. Show that the decision is irrelevant in a world of perfect and frictionless markets. What happens if a personal income tax of 15% on dividends (but not capital gains) is introduced into the model?

A15-27. There are currently 2 million UWC shares outstanding with a market price of \$25.00/share (\$50 million assets \div 2 million shares). If the company retains its profits of \$5 million (0.10 return \times \$50 million value of assets) during the coming year and re-invests these in the new project, the total market value of UWC at year-end will be \$55 million (\$50 million + \$5 million retained profits + project NPV [assumed negligible]), the per share price will be \$27.50/share (\$55 million \div 2 million shares), and investors will have earned a 10% return on their investment.

Now assume that UWC decides instead to pay out its \$5 million in profits as dividends (\$2.50/share) during the coming year, and to fund the \$5 million investment project by issuing new shares. Since the current share price is \$25.00/share, UWC would need to sell 200,000 new shares to raise \$5 million. After this sale, there will be 2.2 million UWC shares outstanding (the original 2 million + 200,000 newly-issued shares) and the total market value of UWC at year-end will be \$55 million (\$50 million initial value

+ \$5 million in proceeds from new shares issued + project NPV [assumed negligible]). Each outstanding share will have a value of \$25.00/share at year-end (\$55 million asset value ÷ 2.2 million shares) and the original shareholders will have earned a 10% return on their investment, all in the form of dividends received (\$2.50/share dividend ÷ \$25.00/share initial share price). Thus dividend policy will be irrelevant for UWC under the assumption of no taxes or transactions costs.

If dividends are taxed at a 15% rate, but capital gains remain untaxed, then dividend policy ceases to be irrelevant. In this case, UWC shareholders would receive after-tax dividends of only \$2.125/share [$\$2.50 \times (1 - 0.15)$] and an investor's after-tax return would be reduced from 10% to only 8.50% ($\$2.125 \div \25.00 initial share price). With such a tax structure, UWC would create more value for shareholders by retaining profits and using these to finance new investments, as in the original example, rather than paying dividends and selling new shares.

- P15-28.** A publicly traded company announces an increase in its dividend with no other material information accompanying the announcement. What information is this announcement likely to convey, and what is the expected stock-price effect, as the market assimilates this information?
- A15-28.** Investors will probably interpret the dividend increase as a sign that the firm's managers believe that profits will increase in the future and that the company will be able to maintain the new, higher dividend payment. Thus, the company's stock price should rise (typically 1-3%) on the dividend increase announcement.
- P15-29.** Sam Sharp purchased 100 shares of Electric Lighting Inc. (ELI) one year ago for \$60 per share. He also received cash dividends totalling \$5 per share since then. Now that ELI's share price has increased to \$64.50 per share, Sam has decided to sell his holdings. What is Sam's gross (pre-tax) and net (after-tax) return on this investment, assuming that he faces a 30% tax rate on dividends and capital gains?
- A15-29.** Sam's pre-tax investment income of \$9.50/share is the sum of dividends received (\$5.00/share) plus share price appreciation (\$4.50/share). This divided by the initial purchase price of \$60/share yields a gross return of 15.83%. If Sam must pay a 30% tax on dividends and capital gains, and actually sells his shares for \$64.50/each, his after-tax income will be \$6.65/share [$(\$5.00 \text{ dividends} + \$4.50 \text{ share price gain}) \times (1 - \text{tax rate}) = \9.50×0.7] and his after-tax return will be 11.08% ($\$6.65/\text{share after-tax income} \div \$60/\text{share initial purchase price}$).

Answer to MiniCase

Dividend Policy

After working for the past four years as a financial analyst for Nevada Power Corporation, you receive a well-deserved promotion. You have been appointed to work on special projects for Mr. Watkins, the chief financial officer (CFO). Your first assignment is to gather information on dividend theory and policy, because the CFO wants to reassess the company's current dividend policy.

Assignment

1. What are the different types of dividend policies? Provide examples of situations in which each of these dividend policies could be used.
2. Describe the difference between cash dividends, bonus share issues, share splits, and share repurchases. Provide examples when each of these forms of dividends can be used.
3. Discuss the theory of dividend irrelevance. How do taxes affect the dividend irrelevance theory?
4. How do managers use dividend policy to convey information to the marketplace? Why is dividend policy, instead of a press release, used to communicate information?

Answers

1. The different types of dividend policies include; (a) Constant Payout Ratio Policy, (b) Constant Dollar Payment Policy, and (c) Low-Regular and Extra Policy.

With constant payout ratio policy the firm establishes a certain percentage of earnings that is paid to owners in each dividend period. The problem with this policy is that if the firm's earnings drop or if a loss occurs in a given period, the dividends may be low or even non-existent, and will in any case be as volatile as the firm's earnings. Therefore, this policy will work best with a company with steady or near constant earnings.

Another type of dividend policy, the constant dollar payment policy, is based on the payment of a fixed-dollar dividend in each period. Often, firms using this policy increase the regular dividend once a proven increase in earnings has occurred. Under this policy, a firm almost never cuts dividends unless it faces a true crisis. This policy will work in those countries where a reduction in dividends is penalised heavily in the marketplace as a signal of bad news (such as the United States).

Some firms establish a low-regular-and-extra policy paying a low regular dividend, supplemented by an additional cash dividend when earnings warrant it. If earnings are higher than normal in a given period, the firm may pay this additional dividend, which is designated an extra dividend or a special dividend. By designating the amount by which the dividend exceeds the regular payment as an extra dividend, the firm avoids giving shareholders false hopes. The use of the 'extra' or 'special' designation is more common among companies that experience temporary shifts in earnings. This policy will work for those companies with excess cash, but also having risk of earnings volatility.

2. With a cash dividend excess cash can be distributed to owners allowing owners to put this cash to better use. Cash dividends are the most common type of dividend.

A bonus share issue is the payment to existing owners of a dividend in the form of bonus shares. The net effect on shareholder wealth is neutral. Shareholders receiving bonus shares also maintain a constant proportional share in the firm's equity. In most cases there are no tangible benefits to paying bonus shares.

Share splits have an effect on a firm's share price similar to that of bonus shares. In the case of a share split, if the decrease in share prices is proportional to the change in shares outstanding, the net effect on shareholder wealth is zero (ignoring the administrative costs of doing the split). Managers nevertheless decide to engage in stock splits because they believe that if the price per share gets too high, some investors (especially individual investors) will no longer trade the shares – in other words, to get the shares back into an acceptable trading range. A share split also has no effect on the firm's capital structure; it simply increases the number of shares outstanding and reduces the per-share par value.

The practical motives for share repurchases include obtaining shares to be used in acquisitions, having shares available for employee share option plans, and retiring shares. From a broader perspective, the rising importance of share repurchases implies that they enhance shareholder value, perhaps because they have traditionally been a tax-advantaged method of distributing cash. Though it is not clear exactly what managers are trying to achieve through repurchases, frequently mentioned rationales include sending a positive signal to investors in the marketplace that management believes that the share is undervalued and reducing the number of shares outstanding and thereby raising earnings per share (EPS).

3. According to the theory of dividend irrelevance, in a world of frictionless capital markets, payout policy cannot affect the market value of the firm. Value derives solely from the inherent profitability of the firm's assets and the competence of its management team.

When the personal tax rate on dividends is higher than the tax rate on capital gains, we have a clear-cut result: firms should not pay any cash dividends. Instead, profitable companies should retain all their earnings, and shareholders should earn their investment returns by selling shares after it has increased in value. However, if a capital gains tax is imposed at a rate equal

to the dividend tax rate, it will again make investors indifferent to whether they receive taxable dividends or taxable capital gains.

4. Managers, who have a better understanding of the firm's true financial condition than shareholders do, can convey this information to shareholders through the dividend policy managers select. Dividend payments have what accountants call 'cash validity,' meaning that these payments are believable and are hard for weaker firms to duplicate. Phrased in economic terms, in a world that is characterised by informational asymmetries between managers and investors, cash dividend payments serve as a credible transmitter of information from corporate insiders (officers and directors) to the company's shareholders. Viewed this way, every aspect of a firm's dividend policy conveys significant new information. Conveying management's confidence that the firm is now profitable enough to both fund its investment projects and pay out cash. Investors and managers know that cutting or eliminating dividend payments once they begin results in a very negative market reaction, so dividend initiations send a strong signal to the market about management's assessment of the firm's long-term ability to generate cash.

The same logic applies to dividend increases. Because everyone understands that dividend cuts are to be avoided at almost all costs, the fact that management is willing to increase dividend payments clearly implies that it is confident profits will remain high enough to support the new payment level. Dividend increases therefore suggest a permanent increase in the firm's normal level of profitability; or, phrased somewhat differently dividends change only when the level of permanent earnings changes. Unfortunately, this logic applies even more strongly to dividend decreases. Because all concerned understand that dividend cuts are viewed as very bad news, managers will reduce dividend payments only when they have no choice, such as when there is a cash flow crisis or when the financial health of the firm is declining and no turnaround is in sight. Therefore, it is no surprise that when managers do cut dividends, the market reaction is often very severe.