

Chapter 16

Distributions to Shareholders: Dividends and Share Repurchases

Learning Objectives

After reading this chapter, students should be able to:

- ◆ Explain why some investors like the firm to pay more dividends while other investors prefer reinvestment and the resulting capital gains.
- ◆ Discuss the various trade-offs that companies face when trying to establish their optimal dividend policy.
- ◆ Differentiate between stock splits and stock dividends.
- ◆ List the advantages and disadvantages of stock repurchases vis-à-vis dividends from both investors' and companies' perspectives.

Lecture Suggestions

We like this chapter and generally cover it in its entirety, but it could be omitted in the introductory course without loss of continuity. Or, sections such as stock dividends or stock repurchases could be omitted.

What we cover, and the way we cover it, can be seen by scanning the slides and Integrated Case solution for Chapter 16, which appears at the end of this chapter solution. For other suggestions about the lecture, please see the “Lecture Suggestions” in Chapter 2, where we describe how we conduct our classes.

DAYS ON CHAPTER: 3 OF 56 DAYS (50-minute periods)

Answers to End-of-Chapter Questions

- 16-1** The biggest advantage of having an announced dividend policy is that it would reduce investor uncertainty, and reductions in uncertainty are generally associated with lower capital costs and higher stock prices, other things equal. The disadvantage is that such a policy might decrease corporate flexibility. However, the announced policy would possibly include elements of flexibility. On balance, it would appear desirable for directors to announce their policies.
- 16-2** While it is true that the cost of outside equity is higher than that of retained earnings, it is not necessarily irrational for a firm to pay dividends and sell stock in the same year. If the firm has been paying a regular dividend, and then cuts it in order to obtain equity capital from retained earnings, there might be an unfavorable effect on the firm's stock price. If investors lived in the world of certainty and rationality postulated by Miller and Modigliani, then the statement would be true, but it is not necessarily true in an uncertain world.
- 16-3** Logic suggests that stockholders like stable dividends—many of them depend on dividend income, and if dividends were cut, this might cause serious hardship. If a firm's earnings are temporarily depressed or if it needs a substantial amount of funds for investment, then it might well maintain its regular dividend using borrowed funds to tide it over until things returned to normal. Of course, this could not be done on a sustained basis—it would be appropriate only on relatively rare occasions.
- 16-4**
- a. MM argue that dividend policy has no effect on r_s , thus no effect on firm value and cost of capital. On the other hand, GL argue that investors view current dividends as being less risky than potential future capital gains. Thus, GL claim that r_s is inversely related to dividend payout.
 - b. MM could claim that tests which show that increased dividends lead to increased stock prices demonstrate that dividend increases are causing investors to revise earnings forecasts upward, rather than cause investors to lower r_s . MM's claim could be countered by invoking the efficient market hypothesis. That is, dividend increases are built into expectations and dividend announcements could lower stock price, as well as raise it, depending on how well the dividend increase matches expectations. Thus, a bias towards price increases with dividend increases supports GL.
 - c. Since there are clients who prefer different dividend policies, MM could argue that one policy is as good as another. But, if the clienteles are of differing sizes or economic means, the clienteles might not be equal, and one dividend policy could be preferential to another.
- 16-5**
- a. From the stockholders' point of view, an increase in the personal income tax rate would make it more desirable for a firm to retain and reinvest earnings. Consequently, an increase in personal tax rates should lower the aggregate payout ratio.
 - b. If the depreciation allowances were raised, cash flows would increase. With higher cash flows, payout ratios would tend to increase. On the other hand, the change in tax-allowed depreciation charges would increase rates of return on investment, other things being equal, and this might stimulate investment, and consequently reduce payout ratios. On balance, it is likely that aggregate payout ratios would rise, and this has in fact been the case.

- c. If interest rates were to increase, the increase would make retained earnings a relatively attractive way of financing new investment. Consequently, the payout ratio might be expected to decline. On the other hand, higher interest rates would cause r_d , r_s , and firms' marginal costs of capital to rise—that would mean that fewer projects would qualify for capital budgeting and the residual would increase (other things constant), hence the payout ratio might increase.
 - d. A permanent increase in profits would probably lead to an increase in dividends, but not necessarily to an increase in the payout ratio. If the aggregate profit increase were a cyclical increase that could be expected to be followed by a decline, then the payout ratio might fall, because firms do not generally raise dividends in response to a short-run profit increase.
 - e. If investment opportunities for firms declined while cash inflows remained relatively constant, an increase would be expected in the payout ratio.
 - f. Dividends are currently paid out of after-tax dollars, and interest charges from before-tax dollars. Permission for firms to deduct dividends as they do interest charges would make dividends less costly to pay than before and would thus tend to increase the payout ratio.
 - g. This change would make capital gains less attractive and would lead to an increase in the payout ratio.
- 16-6**
- a. The residual dividend policy is based on the premise that, since new common stock is more costly than retained earnings, a firm should use all the retained earnings it can to satisfy its common equity requirement. Thus, the dividend payout under this policy is a function of the firm's investment opportunities. See Table 16.2 in the text for an illustration.
 - b. Yes. A more shallow plot implies that changes from the optimal capital structure have little effect on the firm's cost of capital, hence value. In this situation, dividend policy is less critical than if the plot were V-shaped.
- 16-7**
- It is true that executives' salaries are more highly correlated with the size of the firm than with profitability. This being the case, it might be in management's own best interest (assuming that management does not have a substantial ownership position in the firm) to see the size of the firm increase whether or not this is optimal from stockholders' point of view. The larger the investment during any given year, the larger the firm will become. Accordingly, a firm whose management is interested in maximizing firm size rather than the value of the existing common stock might push investments down below the cost of capital. In other words, management might invest to a point where the marginal return on new investment is less than the cost of capital.
- If the firm does invest to a point where the return on investment is less than the cost of capital, the stock price must fall below what it otherwise would have been. Stockholders would be given additional benefits from the higher retained earnings (due to the firm being larger), and this might well push up the stock price, but the increase in stock price would be less than the value of dividends received if the company had paid out a larger percentage of its earnings.
- 16-8**
- The difference is largely one of accounting. In the case of a split, the firm simply increases the number of shares and simultaneously reduces the par or stated value per share. In the case of a stock dividend, there must be a transfer from retained earnings to capital stock. For most firms, a 100% stock dividend and a 2-for-1 stock split accomplish exactly the same thing; hence, investors may choose either one.

- 16-9** It is sometimes argued that there is an optimum price for a stock; that is, a price at which WACC will be minimized, giving rise to a maximum price for any given earnings. If a firm can use stock dividends or stock splits to keep its shares selling at this price (or in this price range), then stock dividends and/or splits will have helped maintain a high P/E ratio. Others argue that stockholders simply like stock dividends and/or splits for psychological or some other reasons. If stockholders do like stock dividends, using them would have the effect of keeping P/E ratios high. Finally, it has been argued that increases in the number of shareholders accompany stock dividends and stock splits. One could, of course, argue that no causality is contained in this relationship. In other words, it could be that growth in ownership and stock splits is a function of yet another variable.
- 16-10**
- a. True. When investors sell their stock they are subject to capital gains taxes.
 - b. True. If a company's stock splits 2 for 1, and you own 100 shares, then after the split you will own 200 shares.
 - c. True. Dividend reinvestment plans that involve newly issued stock will increase the amount of equity capital available to the firm.
 - d. False. The Tax Code, through the tax deductibility of interest, encourages firms to use debt and thus pay interest to investors rather than dividends, which are not tax deductible. In addition, due to the deferral of capital gains taxes until a capital asset is sold, the Tax Code encourages investors in high tax brackets to prefer firms who retain earnings rather than those that pay large dividends.
 - e. True. If a company's clientele prefers large dividends, the firm is unlikely to adopt a residual dividend policy. A residual dividend policy could mean low or zero dividends in some years, which would upset the company's developed clientele.
 - f. False. If a firm follows a residual dividend policy, all else constant, its dividend payout will tend to decline whenever the firm's investment opportunities improve.
- 16-11** Catering theory suggests that investors' preference for dividends varies over time and that corporations adapt dividend policy to "cater" to the current desires of investors. Consequently, corporate managers are more likely to initiate dividends when dividend-paying stocks are in favor with investors, and are more likely to omit dividends when investors prefer capital gains.
- 16-12** The first step in analyzing the Sabah Industries scenario is to determine the historical payout ratio.

| Year | EPS | Dividend/Share | Dividend Payout Ratio |
|------|--------|----------------|-----------------------|
| 2009 | \$1.75 | \$0.95 | 54.28% |
| 2010 | 1.95 | 1.20 | 61.53 |
| 2011 | 2.05 | 1.25 | 60.97 |
| 2012 | 2.25 | 1.30 | 57.77 |

Sabah Industries' historical dividend payout ratio has been fairly consistent and near the 60% constant payout ratio that the board is considering. So in terms of dollar amounts, the new policy would not significantly change the dividend payout to the shareholders in the future. Once the dividend is tied to a constant percentage, the dividends will be tied to Sabah Industries' future earnings and could fluctuate from year to year. However, the evidence from the past 4 years shows that Sabah Industries' earnings have increased from 5–11% per year with no down years.

16-13 After the 10% stock dividend, Johor Farm's stockholder's equity account is as follows:

| | |
|---|-------------------------|
| Common stock (55,000 shares at \$3 par) | \$165,000 |
| Paid-in capital in excess of par | 335,000 |
| Retained earnings | <u>350,000</u> |
| Total stockholders' equity | <u><u>\$850,000</u></u> |

16-14 a. Friday, May 7

b. Monday, May 10

c. The price of the stock should drop by the amount of the dividend (\$0.80).

- d.** 1. She would be better off buying the stock at \$35 and taking the dividend. Her \$0.80 dividend would be taxed as the maximum rate of 15 percent and her \$4 short-term capital gain would be taxed at you ordinary marginal tax rate, which is probably higher than the 15 percent.
2. If she bought the stock post dividend for \$34.20, she would pay her marginal ordinary tax rate on the full \$4.80 of short-term capital gains.

Solutions to End-of-Chapter Problems

- 16-1** 70% Debt; 30% Equity; Capital budget = \$3,000,000; NI = \$2,000,000; PO = ?

Equity retained = $0.3(\$3,000,000) = \$900,000$.

| | |
|--------------------|--------------------|
| NI | \$2,000,000 |
| – Additions to RE | <u>900,000</u> |
| Earnings remaining | <u>\$1,100,000</u> |

$$\text{Payout} = \frac{\$1,100,000}{\$2,000,000} = 55\%.$$

- 16-2** $P_0 = \$90$; Split = 3 for 2; New $P_0 = ?$

$$\frac{\$90}{3/2} = \$60.$$

- 16-3** NI = \$2,000,000; Shares outstanding = 1,000,000; $P_0 = \$32$; Repurchase = 20%; New EPS = ?

Repurchase = $0.2 \times 1,000,000 = 200,000$ shares.

Repurchase amount = $200,000 \times \$32 = \$6,400,000$.

$$\text{EPS}_{\text{Old}} = \frac{\text{NI}}{\text{Shares}} = \frac{\$2,000,000}{1,000,000} = \$2.00.$$

$$\text{P/E}_{\text{Old}} = \frac{\$32}{\$2} = 16\times.$$

$$\text{EPS}_{\text{New}} = \frac{\$2,000,000}{1,000,000 - 200,000} = \frac{\$2,000,000}{800,000} = \$2.50.$$

EPS increases because the number of shares outstanding declines.

- 16-4** DPS after split = \$0.75.

Equivalent pre-split dividend = $\$0.75(5) = \3.75 .

New equivalent dividend = Last year's dividend(1.09)

$\$3.75 = \text{Last year's dividend}(1.09)$

Last year's dividend = $\$3.75/1.09 = \3.44 .

16-5 Retained earnings = Net income (1 – Payout ratio)
 $= \$5,000,000(0.55) = \$2,750,000.$

External equity needed:

Total equity required = (New investment)(1 – Debt ratio)
 $= \$10,000,000(0.60) = \$6,000,000.$

New external equity needed = $\$6,000,000 - \$2,750,000 = \$3,250,000.$

- 16-6** Step 1: Determine the capital budget by selecting those projects whose returns are greater than the project's risk-adjusted cost of capital.

Projects H and L should be chosen because $IRR > WACC$, so the firm's capital budget = \$10 million.

- Step 2: Determine how much of the capital budget will be financed with equity.

$$\begin{aligned} \text{Capital Budget} \times \text{Equity \%} &= \text{Equity required.} \\ \$10,000,000 \times 0.5 &= \$5,000,000. \end{aligned}$$

- Step 3: Determine dividends through residual model.

$$\$7,287,500 - \$5,000,000 = \$2,287,500.$$

- Step 4: Calculate payout ratio.

$$\$2,287,500 / \$7,287,500 = 0.3139 = 31.39\%.$$

16-7 a. Total dividends₁₂ = Net income₁₂ × Payout ratio
 $= \$1,800,000 \times 0.40$
 $= \$720,000.$

$$\begin{aligned} \text{DPS}_{12} &= \text{Dividends}_{12} / \text{Shares outstanding} \\ &= \$720,000 / 500,000 \\ &= \$1.44. \end{aligned}$$

b. Dividend yield = DPS / P_0
 $= \$1.44 / \48.00
 $= 3\%.$

c. Total dividends₁₁ = Net income₁₁ × Payout ratio
 $= \$1,500,000 \times 0.4$
 $= \$600,000.$

$$\begin{aligned} \text{DPS}_{11} &= \text{Dividends}_{11} / \text{Shares outstanding} \\ &= \$600,000 / 500,000 \\ &= \$1.20. \end{aligned}$$

d. Payout ratio = Dividends/Net income
 $= \$600,000/\$1,800,000$
 $= 0.3333 = 33\frac{1}{3}\%$.

- e. Since the company would like to avoid transactions costs involved in issuing new equity, it would be best for the firm to maintain the same per-share dividend. This will provide a stable dividend to investors, yet allow the firm to expand operations without significantly affecting the dividend. A constant dividend payout ratio would cause serious fluctuations to the dividend depending on the level of earnings. If earnings were high, then dividends would be high. However, if earnings were low, then dividends would be low. This would cause great uncertainty for investors regarding dividends and would cause the firm's stock price to decline (because investors prefer a more stable dividend policy).

- 16-8 a.** Before finding the long-run growth rate, the dividend payout ratio must be determined.

$$\text{Dividend payout ratio} = \text{DPS/EPS} = \$0.75/\$2.25 = 0.3333.$$

The firm's long-run growth rate can be found by multiplying the portion of a firm's earnings that are retained times the firm's return on equity.

$$\begin{aligned} g &= \text{ROE} \times \text{Retention ratio} \\ &= (\text{Net Income/Equity Capital}) \times (1 - \text{Dividend payout ratio}) \\ &= 18\% \times (1 - 0.3333) = 12\%. \end{aligned}$$

- b. The required return can be calculated using the DCF approach.

$$\begin{aligned} r_s &= D_1/P_0 + g \\ &= \$0.75/\$12.50 + 0.12 \\ &= 0.06 + 0.12 \\ &= 0.18 \text{ or } 18\%. \end{aligned}$$

- c. The new payout ratio can be calculated as:

$$\$1.50/\$2.25 = 0.6667.$$

The new long-run growth rate can now be calculated as:

$$\begin{aligned} g &= \text{ROE} \times (1 - \text{Dividend payout ratio}) \\ &= 18\% \times (1 - 0.6667) = 6\%. \end{aligned}$$

The firm's required return would be:

$$\begin{aligned} r_s &= D_1/P_0 + g \\ &= \$1.50/\$12.50 + 0.06 \\ &= 0.12 + 0.06 \\ &= 0.18 \text{ or } 18\%. \end{aligned}$$

- d. The firm's original plan was to issue a dividend equal to \$0.75 per share, which equates to a total dividend of \$0.75 times the number of shares outstanding. So, first the number of shares outstanding must be determined from the EPS.

$$\begin{aligned} \text{Amount of equity capital} &= \text{Total assets} \times \text{Equity ratio} \\ &= \$10 \text{ million} \times 0.6 = \$6 \text{ million}. \end{aligned}$$

Net income = Equity capital \times ROE = \$6 million \times 0.18 = \$1.08 million.

$$\begin{aligned}\text{EPS} &= \text{Net income/Number of shares} \\ \$2.25 &= \$1.08 \text{ million/Number of shares} \\ \text{Number of shares} &= 480,000.\end{aligned}$$

With 480,000 shares outstanding, the total dividend that would be paid would be $\$0.75 \times 480,000 \text{ shares} = \$360,000$. The firm's current market capitalization is \$6.0 million, determined by 480,000 shares at \$12.50 per share. (BV = MV per problem.) If the stock dividend is implemented, it shall account for 6% of the firm's current market capitalization ($\$360,000/\$6,000,000 = 0.06$).

- e. If the total amount of value to be distributed to shareholders is \$360,000, at a price of \$12.50 per share, then the number of new shares issued would be:

$$\begin{aligned}\text{Number of new shares} &= \text{Dividend value/Price per share} \\ &= \$360,000/\$12.50 \\ &= 28,800 \text{ shares.}\end{aligned}$$

The stock dividend will leave the firm's net income unchanged; therefore, the firm's new EPS is its net income divided by the new total number of shares outstanding.

$$\begin{aligned}\text{New EPS} &= \text{Net income}/(\text{Old shares outstanding} + \text{New shares outstanding}) \\ &= \$1,080,000/(480,000 + 28,800) \\ &= \$2.1226.\end{aligned}$$

The dilution of earnings per share is the difference between old EPS and new EPS.

$$\begin{aligned}\text{Dilution of EPS} &= \text{Old EPS} - \text{New EPS} \\ &= \$2.25 - \$2.1226 \\ &= \$0.1274 \approx \$0.13 \text{ per share.}\end{aligned}$$

- 16-9 a.** 1. 2012 Dividends = (1.10)(2011 Dividends)
= (1.10)(\\$3,600,000) = \$3,960,000.
2. 2011 Payout = $\$3,600,000/\$10,800,000 = 0.3333 = 33\frac{1}{3}\%$.
- 2012 Dividends = (0.3333)(2012 Net income)
= (0.3333)(\\$14,400,000) = \$4,800,000.

(Note: If the payout ratio is rounded off to 33%, 2012 dividends are then calculated as \$4,752,000.)

3. Equity financing = $\$8,400,000(0.60) = \$5,040,000$.
- 2012 Dividends = Net income – Equity financing
= $\$14,400,000 - \$5,040,000 = \$9,360,000$.

All of the equity financing is done with retained earnings as long as they are available.

4. The regular dividends would be 10% above the 2011 dividends:
- Regular dividends = (1.10)(\\$3,600,000) = \$3,960,000.

The residual policy calls for dividends of \$9,360,000. Therefore, the extra dividend, which would be stated as such, would be

$$\text{Extra dividend} = \$9,360,000 - \$3,960,000 = \$5,400,000.$$

An even better use of the surplus funds might be a stock repurchase.

- b. Policy 4, based on the regular dividend with an extra, seems most logical. Implemented properly, it would lead to the correct capital budget and the correct financing of that budget, and it would give correct signals to investors.

c. $r_s = \frac{D_1}{P_0} + g = \frac{\$9,000,000}{\$180,000,000} + 10\% = 15\%.$

d. $g = \text{Retention rate}(\text{ROE})$
 $0.10 = [1 - (\$3,600,000/\$10,800,000)](\text{ROE})$
 $\text{ROE} = 0.10/0.6667 = 0.15 = 15\%.$

- e. A 2012 dividend of \$9,000,000 may be a little low. The cost of equity is 15%, and the average return on equity is 15%. However, with an average return on equity of 15%, the marginal return is lower yet. That suggests that the capital budget is too large, and that more dividends should be paid out. Of course, we really cannot be sure of this—the company could be earning low returns (say 10%) on existing assets yet have extremely profitable investment opportunities this year (say averaging 30%) for an expected overall average ROE of 15%. Still, if this year's projects are like those of past years, then the payout appears to be slightly low.

16-10 a. Ex dividend date is Thursday, July 6.

| | | | |
|---------|-----------|-------------------|-------------|
| b. Cash | \$170,000 | Dividends payable | \$0 |
| | | Retained earnings | \$2,170,000 |

- c. The dividend payment will result in a decrease in total assets equal to the amount of the payment.
- d. Notwithstanding general market fluctuations, the stock price would be expected to drop by the amount of the declared dividend on the ex dividend date.

16-11 a.

| Year | Dividend | Year | Dividend |
|------|----------|------|----------|
| 2003 | \$0.10 | 2008 | \$1.28 |
| 2004 | 0.00 | 2009 | 1.12 |
| 2005 | 0.72 | 2010 | 1.28 |
| 2006 | 0.48 | 2011 | 1.52 |
| 2007 | 0.96 | 2012 | 1.60 |

b.

| Year | Dividend | Year | Dividend |
|------|----------|------|----------|
| 2003 | \$1.00 | 2008 | \$1.10 |
| 2004 | 1.00 | 2009 | 1.20 |
| 2005 | 1.00 | 2010 | 1.30 |
| 2006 | 1.00 | 2011 | 1.40 |
| 2007 | 1.00 | 2012 | 1.50 |

c.

| Year | Dividend | Year | Dividend |
|------|----------|------|----------|
| 2003 | \$0.50 | 2008 | \$0.66 |
| 2004 | 0.50 | 2009 | 0.50 |
| 2005 | 0.50 | 2010 | 0.66 |
| 2006 | 0.50 | 2011 | 1.14 |
| 2007 | 0.50 | 2012 | 1.30 |

- d. With a constant-payout policy, if the firm's earnings drop or a loss occurs the dividends will be low or nonexistent. A regular dividend or a low-regular-and-extra dividend policy reduces owner uncertainty by paying relatively fixed and continuous dividends.

16-12 a.

| | Cash Dividend | | | |
|---|---------------|-------------|-----------|-----------|
| | \$0.01 | \$0.05 | \$0.10 | \$0.20 |
| Preferred Stock | \$100,000 | \$100,000 | \$100,000 | \$100,000 |
| Common Stock (400,000 shares @\$1.00 par) | 400,000 | 400,000 | 400,000 | 400,000 |
| Paid-in Capital in Excess of Par | 200,000 | 200,000 | 200,000 | 200,000 |
| Retained Earnings | 316,000 | 300,000 | 280,000 | 240,000 |
| Stockholders' Equity | \$1,016,000 | \$1,000,000 | \$980,000 | \$940,000 |

b.

| | Stock Dividend | | | |
|---|----------------|-------------|-------------|-------------|
| | 1% | 5% | 10% | 20% |
| Preferred Stock | \$100,000 | \$100,000 | \$100,000 | \$100,000 |
| Common Stock (400,000 shares @\$1.00 par) | 404,000 | 420,000 | 440,000 | 480,000 |
| Paid-in Capital in Excess of Par | 212,000 | 260,000 | 320,000 | 440,000 |
| Retained Earnings | 304,000 | 240,000 | 160,000 | 0 |
| Stockholders' Equity | \$1,020,000 | \$1,020,000 | \$1,020,000 | \$1,020,000 |

- c. Stock dividends do not affect stockholders' equity; they only redistribute retained earnings into common stock and additional paid-in capital accounts. Cash dividends cause a decrease in retained earnings and, hence, in overall stockholders' equity.

Comprehensive/Spreadsheet Problem

Note to Instructors:

The solution to this problem is not provided to students at the back of their text. Instructors can access the *Excel* file on the textbook's website.

16-13 a.

| | | | | | | |
|----|------------------------------|------------------------|---------------------|--|--|--|
| 15 | | | | | | |
| 16 | Input Data | | | | | |
| 17 | DPS | \$3.00 | | | | |
| 18 | Target equity ratio | 60% | | | | |
| 19 | Target debt ratio | 40% | | | | |
| 20 | Shares outstanding | 1,000,000 | | | | |
| 21 | Net income | \$8,000,000 | | | | |
| 22 | Total capital budget | \$10,000,000 | | | | |
| 23 | | | | | | |
| 24 | Required retained earnings = | Total capital budget × | Target equity ratio | | | |
| 25 | Required retained earnings = | \$10,000,000 × | 60% | | | |
| 26 | Required retained earnings = | \$6,000,000 | | | | |
| 27 | | | | | | |

Capital budget = \$10,000,000; Capital structure = 60% equity, 40% debt; Common shares outstanding = 1,000,000.

Retained earnings needed = \$10,000,000(0.6) = \$6,000,000.

b.

| | | | | | |
|----------------------------------|---------------|---|-------------|--------------------|--|
| Dividend per share = (Net Income | - | Required RE) | / | Shares outstanding | |
| Dividend per share = \$8,000,000 | - | \$6,000,000 | / | 1,000,000 | |
| Dividend per share = | \$2.00 | So, following the residual policy would require a dividend cut. | | | |
| Dividend payout ratio = | Dividend paid | / | Net Income | | |
| Dividend payout ratio = | \$2,000,000 | / | \$8,000,000 | | |
| Dividend payout ratio = | 25% | | | | |

According to the residual dividend model, only \$2 million is available for dividends.

NI – Retained earnings needed for capital projects = Residual dividend
 $\$8,000,000 - \$6,000,000 = \$2,000,000$.

DPS = $\$2,000,000 / 1,000,000 = \2.00 .

Payout ratio = $\$2,000,000 / \$8,000,000 = 25\%$.

c.

| | | | | | |
|-------------------------------------|-------------|---|--------|---|-------------|
| Desired DPS = | \$3.00 | | | | |
| Retained earnings for cap. budget : | Net Income | - | DPS | × | # of shares |
| Retained earnings for cap. budget : | \$8,000,000 | - | \$3.00 | × | 1,000,000 |
| Retained earnings for cap. budget : | \$5,000,000 | | | | |

Retained earnings available = $\$8,000,000 - \$3.00(1,000,000)$

$$= \$5,000,000.$$

- d. No. If the company maintains its \$3.00 DPS, only \$5 million of retained earnings will be available for capital projects. However, if the firm is to maintain its current capital structure \$6 million of equity is required. This would necessitate the company having to issue \$1 million of new common stock.
- e. Capital budget = \$10 million; Dividends = \$3 million; NI = \$8 million; Capital structure = ?

| | | | | |
|------------------------------------|---------------|---|------------------------------------|--|
| DPS | \$3.00 | | | |
| Total capital budget | \$10,000,000 | | | |
| Dividends paid = | DPS | × | Shares outstanding | |
| Dividends paid = | \$3.00 | × | 1,000,000 | |
| Dividends paid = | \$3,000,000 | | | |
| RE Available = | Net Income | – | Dividends paid | |
| RE Available = | \$8,000,000 | – | \$3,000,000 | |
| RE Available = | \$5,000,000 | | | |
| Portion of cap. budget from equity | RE to be used | / | Total capital budget | |
| Portion of cap. budget from equity | \$5,000,000 | / | \$10,000,000 | |
| Portion of cap. budget from equity | 50% | | | |
| Portion of cap. budget from debt | 100% | – | Portion of cap. budget from equity | |
| | 100% | – | 50% | |
| Portion of cap. budget from debt | 50% | | | |

$$\begin{aligned}\text{RE available} &= \$8,000,000 - \$3,000,000 \\ &= \$5,000,000.\end{aligned}$$

$$\text{Percentage of capital budget financed with RE} = \frac{\$5,000,000}{\$10,000,000} = 50\%.$$

$$\text{Percentage of capital budget financed with debt} = \frac{\$5,000,000}{\$10,000,000} = 50\%.$$

- f. Dividends = \$3 million; Capital budget = \$10 million; 60% equity, 40% debt; NI = \$8 million.

$$\text{Equity needed} = \$10,000,000(0.6) = \$6,000,000.$$

$$\begin{aligned}\text{RE available} &= \$8,000,000 - \$3.00(1,000,000) \\ &= \$5,000,000.\end{aligned}$$

$$\begin{aligned}\text{External (New) equity needed} &= \$6,000,000 - \$5,000,000 \\ &= \$1,000,000.\end{aligned}$$

g.

| | | | |
|----------------------|--------------|---|---------------------|
| Total capital budget | Available RE | / | Target Equity ratio |
| = | \$5,000,000 | / | 60% |
| Total capital budget | \$8,333,333 | | |

Dividends = \$3 million; NI = \$8 million; Capital structure = 60% equity, 40% debt.

$$\begin{aligned}\text{RE available} &= \$8,000,000 - \$3,000,000 \\ &= 5,000,000.\end{aligned}$$

We're forcing the RE available = Required equity to fund the new capital budget.

$$\begin{aligned}\text{Required equity} &= \text{Capital budget}(\text{Target equity ratio}) \\ \$5,000,000 &= \text{Capital budget}(0.6) \\ \text{Capital budget} &= \$8,333,333.\end{aligned}$$

Therefore, if Bumiputra cuts its capital budget from \$10 million to \$8.33 million, it can maintain its \$3.00 DPS, its current capital structure, and still follow the residual dividend policy.

h. The firm can do one of four things:

- (1) Cut dividends.
- (2) Change capital structure, that is, use more debt.
- (3) Cut its capital budget.
- (4) Issue new common stock.

Realize that each of these actions is not without consequences to the company's cost of capital, stock price, or both.

If retained earnings are not sufficient to fund its capital budget, then the firm must issue new common stock if it does not want to forgo any investment opportunities. However, this will raise the firm's cost of equity, which will raise its WACC. The firm may be able to increase its debt ratio, so as to increase its retained earnings breakpoint—which will allow it to use retained earnings rather than new common equity to fund its capital budget. The effect on WACC would be negligible. The firm could also forgo investment opportunities; however, this would result in not maximizing the firm's value. Finally, the firm could reduce dividends—which would increase the firm's retained earnings. However, dividends are "sticky" so this would also have a negative impact on the firm's WACC (increasing it). The "best" alternative to the firm is probably "adjusting" its debt ratio as this probably has the least impact on the firm's WACC.

Integrated Case

16-14

Tenggara Steel Company

Dividend Policy

Tenggara Steel Company (TSC) was formed 5 years ago to exploit a new continuous casting process. TSC's founders, Donald Bambang and Mawar Yaakob, had been employed in the research department of a major integrated-steel company; but when that company decided against using the new process (which Bambang and Yaakob had developed), they decided to strike out on their own. One advantage of the new process was that it required relatively little capital compared to the typical steel company, so Bambang and Yaakob have been able to avoid issuing new stock and thus own all of the shares. However, TSC has now reached the stage in which outside equity capital is necessary if the firm is to achieve its growth targets yet still maintain its target capital structure of 60% equity and 40% debt. Therefore, Bambang and Yaakob have decided to take the company public. Until now, Bambang and Yaakob have paid themselves reasonable salaries but routinely reinvested all after-tax earnings in the firm; so the firm's dividend policy has not been an issue. However, before talking with potential outside investors, they must decide on a dividend policy.

Assume that you were recently hired by Bursa Consulting Company (BCC), a national consulting firm, which has been asked to help TSC prepare for its public offering. Martha Minah, the senior BCC consultant in your group, has asked you to make a presentation to Bambang and Yaakob in which you review the theory of dividend policy and discuss the following questions.

A. (1) What is meant by the term dividend policy?

Answer: [Show S16-1 and S16-2 here.] Dividend policy is defined as the firm's policy with regard to paying out earnings as dividends versus retaining them for reinvestment in the firm. Dividend policy really involves three key issues: (1) How much should be distributed? (2) Should the distribution be as cash dividends, or should the cash be passed on to shareholders by repurchasing some of the stock they hold? (3) How stable should the distribution be, that is, should the funds paid out from year to year be stable and dependable, which stockholders would probably prefer, or be allowed to vary with the firm's cash flows and investment requirements, which would probably be better from the firm's standpoint?

A. (2) Explain briefly the dividend irrelevance theory that was put forward by Modigliani and Miller. What were the key assumptions underlying their theory?

Answer: [Show S16-3 here.] Dividend irrelevance refers to the theory that investors are indifferent between dividends and capital gains, making dividend policy irrelevant with regard to its effect on the value of the firm.

The dividend irrelevance theory was proposed by MM, but they had to make some very restrictive assumptions to "prove" it. These assumptions include, among other things, that no taxes are paid on dividends, that stocks can be bought and sold with no transactions costs, and that everyone—investors and managers alike—has the same information regarding firms' future earnings. MM argued that paying out a dollar per share of dividends reduces the growth rate in earnings and dividends, because new stock will have to be sold to

replace the capital paid out as dividends. Under their assumptions, a dollar of dividends will reduce the stock price by exactly \$1. Therefore, according to MM, stockholders should be indifferent between dividends and capital gains.

A. (3) Why do some investors prefer high-dividend-paying stocks, while other investors prefer stocks that pay low or nonexistent dividends?

Answer: [Show S16-4 and S16-5 here.] Investors might prefer dividends to capital gains because they may regard dividends as less risky than potential future capital gains. If this were so, then investors would value high-payout firms more highly—that is, a high-payout stock would have a high price.

Investors might prefer low-payout firms or capital gains to dividends because they may want to avoid transactions costs—that is, having to reinvest the dividends and incurring brokerage costs, not to mention taxes. The maximum tax rate on dividends is the same as it is for capital gains (although this may change on 01/01/2013); however, taxes on dividends are due in the year they are received, while taxes on capital gains are due whenever the stock is sold. In addition, if an investor holds a stock until his/her death, the beneficiaries can use the date of the death as the cost-basis date and escape all previously accrued capital gains.

B. Discuss (1) the information content, or signaling, hypothesis; (2) the clientele effect; (3) catering theory; and (4) their effects on dividend policy.

Answer: [Show S16-6 through S16-8 here.] It has long been recognized that the announcement of a dividend increase often results in an increase in the stock price, while an announcement of a dividend cut typically

causes the stock price to fall. One could argue that this observation supports the premise that investors prefer dividends to capital gains. However, MM argued that dividend announcements are signals through which management conveys information to investors. Information asymmetries exist—managers know more about their firms' prospects than do investors. Further, managers tend to raise dividends only when they believe that future earnings can comfortably support a higher dividend level, and they cut dividends only as a last resort. Therefore, (1) a larger-than-normal dividend increase "signals" that management believes the future is bright, (2) a smaller-than-expected increase, or a dividend cut, is a negative signal, and (3) if dividends are increased by a "normal" amount, this is a neutral signal.

Different groups, or clienteles, of stockholders prefer different dividend payout policies. For example, many retirees, pension funds, and university endowment funds are in a low (or zero) tax bracket, and they have a need for current cash income. Therefore, this group of stockholders might prefer high-payout stocks. These investors could, of course, sell some of their stock, but this would be inconvenient, transactions costs would be incurred, and the sale might have to be made in a down market. Conversely, investors in their peak earnings years who are in high-tax brackets and who have no need for current cash income should prefer low-payout stocks.

Clienteles do exist, but the real question is whether there are more members of one clientele than another, which would affect what a change in its dividend policy would do to the demand for the firm's stock. There are also costs (taxes and brokerage) to stockholders who would be forced to switch from one stock to another if a firm changes its dividend policy. Therefore, we cannot

say whether a dividend policy change to appeal to one particular clientele or another would lower or raise a firm's cost of equity. MM argued that one clientele is as good as another, so in their view the existence of clienteles does not imply that one dividend policy is better than another. Still, no one has offered convincing proof that firms can disregard clientele effects. We know that stockholder shifts will occur if dividend policy is changed, and since such shifts result in transactions costs and capital gains taxes, dividend policy changes should not be taken lightly. Further, dividend policy should be changed slowly, rather than abruptly, in order to give stockholders time to adjust.

Catering theory suggests that investors' preference for dividends varies over time and that corporations adapt their dividend policy to cater to the current desires of investors. This theory suggests that corporate managers accommodate the shifting preferences of investors, and are more likely to initiate dividends when dividend-paying stocks are in favor with investors, and are more likely to omit dividends when investors demonstrate a greater preference for capital gains.

- C. (1) Assume that TSC has an \$800,000 capital budget planned for the coming year. You have determined that its present capital structure (60% equity and 40% debt) is optimal, and its net income is forecasted at \$600,000. Use the residual dividend model to determine TSC's total dollar dividend and payout ratio. In the process, explain how the residual dividend model works. Then explain what would happen if expected net income was \$400,000 or \$800,000.

Answer: [Show S16-9 through S16-12 here.] We make the following points:

1. Given the optimal capital budget and the target capital structure, we must now determine the amount of equity needed to finance the projects. Of the \$800,000 required for the capital budget, $0.6(\$800,000) = \$480,000$ must be raised as equity and $0.4(\$800,000) = \$320,000$ must be raised as debt if we are to maintain the optimal capital structure:

| | | |
|--------|------------------|-------------|
| Debt | \$320,000 | 40% |
| Equity | <u>480,000</u> | <u>60%</u> |
| | <u>\$800,000</u> | <u>100%</u> |

2. If a residual exists—that is, if net income exceeds the amount of equity the company needs—then it should pay the residual amount out in dividends. Since \$600,000 of earnings is available, and only \$480,000 is needed, the residual is $\$600,000 - \$480,000 = \$120,000$, so this is the amount that should be paid out as dividends. Thus, the payout ratio would be $\$120,000/\$600,000 = 0.20 = 20\%$.
3. If only \$400,000 of earnings were available, the firm would still need \$480,000 of equity. It should then retain all of its earnings and also sell \$80,000 of new stock. The residual policy would call for a zero dividend payment.
4. If \$800,000 of earnings were available, the dividend would be increased to $\$800,000 - \$480,000 = \$320,000$, and the payout ratio would rise to $\$320,000/\$800,000 = 40\%$.

C. (2) In general terms, how would a change in investment opportunities affect the payout ratio under the residual dividend model?

Answer: [Show S16-13 here.] A change in investment opportunities would lead to an increase (if investment opportunities were good) or a decrease (if investment opportunities were not good) in the amount of equity needed. If investment opportunities were good then the residual amount would be smaller than if investment opportunities were bad.

C. (3) What are the advantages and disadvantages of the residual policy? (Hint: Don't neglect signaling and clientele effects.)

Answer: [Show S16-14 here.] The primary advantage of the residual policy is that the firm makes maximum use of lower-cost retained earnings, thus minimizing flotation costs and hence the cost of capital. Also, whatever negative signals are associated with stock issues would be avoided.

However, if it were applied exactly, the residual model would result in dividend payments that fluctuated significantly from year to year as capital requirements and internal cash flows fluctuated. This would (1) send investors conflicting signals over time regarding the firm's future prospects, and (2) since no specific clientele would be attracted to the firm, it would be an "orphan." These signaling and clientele effects would lead to a higher required return on equity that would more than offset the effects of lower flotation costs. Because of these factors, few if any publicly-owned firms follow the residual model on a year-to-year basis.

Even though the residual approach is not used to set the annual dividend, it is used when firms establish their long-run dividend policy. If "normalized" cost of capital and investment opportunity conditions suggest that in a "normal" year the company should pay

out about 60% of its earnings, this fact will be noted and used to help determine the firm's long-run dividend policy.

D. Describe the series of steps that most firms take in setting dividend policy in practice.

Answer: [Show S16-15 here.] Firms establish dividend policy within the framework of their overall financial plans. The steps in setting policy are listed below:

1. The firm forecasts its annual capital budget and its annual sales, along with its working capital needs, for a relatively long-term planning horizon, often 5 years.
2. The target capital structure, presumably the one that minimizes the WACC while retaining sufficient reserve borrowing capacity to provide "financing flexibility," will also be established.
3. With its capital structure and investment requirements in mind, the firm can estimate the approximate amount of debt and equity financing required during each year over the planning horizon.
4. A long-term target payout ratio is then determined, based on the residual model concept. Because of flotation costs and potential negative signaling, the firm will not want to issue common stock unless this is absolutely necessary. At the same time, due to the clientele effect, the firm will move cautiously from its past dividend policy, if a new policy appears to be warranted, and it will move toward any new policy gradually rather than in one giant step.
5. An actual dollar dividend, say \$2 per year, will be decided upon. The size of this dividend will reflect (1) the long-run target

payout ratio and (2) the probability that the dividend, once set, will have to be lowered, or, worse yet, omitted. If there is a great deal of uncertainty about cash flows and capital needs, then a relatively low initial dollar dividend will be set, for this will minimize the probability that the firm will have to either reduce the dividend or sell new common stock. The firm will run its corporate planning model so that management can see what is likely to happen with different initial dividends and projected growth rates under different economic scenarios.

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| E. | What is a dividend reinvestment plan (DRIP), and how does it work? |
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Answer: [Show S16-16 through S16-18 here.] Under a dividend reinvestment plan (DRIP), shareholders have the option of automatically reinvesting their dividends in shares of the firm's common stock. In an open market purchase plan, a trustee pools all the dividends to be reinvested and then buys shares on the open market. Shareholders use the DRIP for three reasons: (1) brokerage costs are reduced by the volume purchases, (2) the DRIP is a convenient way to invest excess funds, and (3) the company generally pays all administrative costs associated with the operation.

In a new stock plan, the firm issues new stock to the DRIP members in lieu of cash dividends. No fees are charged, and many companies even offer the stock at a 5% discount from the market price on the dividend date on the grounds that the firm avoids flotation costs that would otherwise be incurred. Only firms that need new equity capital use new stock plans, while firms with no need for new stock use an open market purchase plan.

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| F. | What are stock dividends and stock splits? What are the advantages and disadvantages of stock dividends and stock splits? |
|----|---|

Answer: [Show S16-19 through S16-21 here.] When it uses a stock dividend, a firm issues new shares in lieu of paying a cash dividend. For example, in a 5% stock dividend, the holder of 100 shares would receive an additional 5 shares. In a stock split, the number of shares outstanding is increased (or decreased in a reverse split) in an action unrelated to a dividend payment. For example, in a 2-for-1 split, the number of shares outstanding is doubled. A 100% stock dividend and a 2-for-1 stock split would produce the same effect, but there would be differences in the accounting treatments of the two actions.

Both stock dividends and stock splits increase the number of shares outstanding and, in effect, cut the pie into more, but smaller, pieces. If the dividend or split does not occur at the same time as some other event that would alter perceptions about future cash flows, such as an announcement of higher earnings, then one would expect the price of the stock to adjust such that each investor's wealth remains unchanged. For example, a 2-for-1 split of a stock selling for \$50 would result in the stock price being halved, to \$25.

It is hard to come up with a convincing rationale for small stock dividends, like 5% or 10%. No economic value is being created or distributed, yet stockholders have to bear the administrative costs of the distribution. Further, it is inconvenient to own an odd number of shares as may result after a small stock dividend. Thus, most companies today avoid small stock dividends.

On the other hand, there is a good reason for stock splits or large stock dividends. Specifically, there is a widespread belief that an optimal price range exists for stocks. The argument goes as

follows: if a stock sells for about \$20-\$80, then it can be purchased in round lots, hence at reduced commissions, by most investors. A higher price would put round lots out of the price range of many small investors, while a stock price lower than about \$20 would convey the image of a stock that is doing poorly. Thus, most firms try to keep their stock prices within the \$20 to \$80 range. If the company prospers, it will split its stock occasionally to hold the price down. (Also, companies that are doing poorly occasionally use reverse splits to raise their price.) Many companies do operate outside the \$20 to \$80 range, but most stay within it.

Another factor that may influence stock splits and dividends is the belief that they signal management's belief that the future is bright. If a firm's management would be inclined to split the stock or pay a stock dividend only if it anticipated improvements in earnings and dividends, then a split/dividend action could provide a positive signal and thus boost the stock price. However, if earnings and cash dividends did not subsequently rise, the price of the stock would fall back to its old level, or even lower, because managers would lose credibility.

Interestingly, one of the most astute investors of the 20th century, Warren Buffett, chairman of Berkshire Hathaway, had long resisted the use of stock splits, but he recently shifted gears in early 2010. After Berkshire Hathaway acquired Burlington Northern Santa Fe, the company announced a 50-1 split for its Class B shares. Prior to the announcement, the stock traded around \$3,500 per share. After the split, the stock traded around \$70 per share, and in October 2011 the stock was trading around \$76 per share.

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| <p>G. What are stock repurchases? Discuss the advantages and disadvantages of a firm's repurchasing its own shares.</p> |
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Answer: [Show S16-22 through S16-24 here.] A firm may distribute cash to stockholders by repurchasing its own stock rather than paying out cash dividends. Stock repurchases can be used (1) somewhat routinely as an alternative to regular dividends, (2) to dispose of excess (nonrecurring) cash that came from asset sales or from temporarily high earnings, and (3) in connection with a capital structure change in which debt is sold and the proceeds are used to buy back and retire shares.

Advantages of repurchases:

1. A repurchase announcement may be viewed as a positive signal that management believes the shares are undervalued.
2. Stockholders have a choice—if they want cash, they can tender their shares, receive the cash, and pay the taxes, or they can keep their shares and avoid taxes. On the other hand, one must accept a cash dividend and pay taxes on it.
3. If the company raises the dividend to dispose of excess cash, this higher dividend must be maintained to avoid adverse stock price reactions. A stock repurchase, on the other hand, does not obligate management to future repurchases.
4. Repurchased stock, called treasury stock, can be used later in mergers, when employees exercise stock options, when convertible bonds are converted, and when warrants are exercised. Treasury stock can also be resold in the open market if the firm needs cash. Repurchases can remove a large block of stock that is “overhanging” the market and keeping the price per share down.
5. Repurchases can be varied from year to year without giving off adverse signals, while dividends may not.

6. Repurchases can be used to produce large-scale changes in capital structure.

Disadvantages of repurchases:

1. A repurchase could lower the stock's price if it is taken as a signal that the firm has relatively few good investment opportunities. On the other hand, though, a repurchase can signal stockholders that managers are not engaged in "empire building," where they invest funds in low-return projects.
2. If the IRS establishes that the repurchase was primarily to avoid taxes on dividends, then penalties could be imposed. Such actions have been brought against closely-held firms, but to our knowledge charges have never been brought against publicly-held firms.
3. Selling shareholders may not be fully informed about the repurchase; hence, they may make an uninformed decision and may later sue the company. To avoid this, firms generally announce repurchase programs in advance.
4. The firm may bid up the stock price resulting in the firm paying too high a price for the shares. In this situation, the selling shareholders would gain at the expense of the remaining shareholders. This could occur if a tender offer were made and the price was set too high, or if the repurchase was made in the open market and buying pressure drove the price above its equilibrium level.