

Principles of Managerial Finance Solution

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CHAPTER 13

Dividend Policy

INSTRUCTOR'S RESOURCES

Overview

Chapter 13 concentrates on the dividend decision from the viewpoint of both the firm and the investors. The types of dividend policies, forms of dividends, and their possible effects on the value of the firm are included in this chapter. The arguments for the relevancy and irrelevancy of dividends are presented. The legal, contractual and internal constraints affecting dividend policy are discussed. An introduction to dividend reinvestment plans is included.

PMF DISK

This chapter's topics are not covered on the *PMF Tutor* or the *PMF Problem-Solver*.

PMF Templates

A spreadsheet template is provided for the following problem:

<u>Problem</u>	<u>Topic</u>
13-11	Stock dividend–Investor

Study Guide

The following *Study Guide* examples are suggested for classroom presentation:

<u>Example</u>	<u>Topic</u>
1	Dividend policy

ANSWERS TO REVIEW QUESTIONS

- 13-1** All holders of a firm's stock in the firm's stock ledger on the *date of record*, which is set by the directors, will receive a declared dividend. These stockholders are referred to as *holders of record*. Due to the time needed to make bookkeeping entries when a stock is traded the stock will sell *ex dividend*, which means without dividends, beginning four business days prior to the date of record. The firm's directors set both the date of record and the dividend payment date.
- 13-2** *Dividend reinvestment plans* enable stockholders to use dividends to acquire full or fractional shares at little or no transaction cost. These plans can be handled in either of two ways. In one approach, a third-party trustee is paid a fee to buy the firm's outstanding shares on the open market on behalf of the shareholders. This plan benefits the participants by reducing their transaction cost. The second approach involves buying newly issued shares directly from the firm with no transaction cost.
- 13-3** The residual theory of dividends suggests that the firm's dividend payment should be the amount left over (the residual) after all acceptable investment opportunities have been undertaken. Since investment opportunities would tend to vary year to year, this approach would not lead to a stable dividend. This theory considers dividends irrelevant, representing earnings residual rather than an active policy component affecting the firm's value.
- 13-4**
- a. The *dividend irrelevance theory* proposed by Miller and Modigliani (M & M) states that in a perfect world; the value of a firm is not affected by dividends but is determined solely by the earnings power and risk of the company's assets. The proportion of retained earnings used for dividends versus reinvestment also has no impact on value. M and M argue that changes in share price following increases or decreases in dividends are the result of the informational content of dividends, which sends a signal to investors that management expects future earnings to change in the same direction as the change in dividends. Another aspect of M and M's theory is the clientele effect, which means that investors choose firms with dividend policies corresponding to their own preferences. Since shareholders get what they expect, stock value is unaffected by dividend policy.
 - b. Conversely, Gordon and Lintner's *dividend relevance theory* states that there is a direct relationship between a firm's dividend policy and its market value. According to their *bird-in-the-hand argument*, investors are generally risk-averse, and current dividends (bird-in-the-hand) reduce investor uncertainty by lowering the discount rate applied to earnings, thereby increasing stock value.
- Although empirical studies of *dividend relevance theory* have not provided conclusive evidence supporting this argument, it intuitively makes sense. In practice, it appears that actions of managers and investors support dividend relevance.
- 13-5**
- a. *Legal constraints* prohibit the corporation from paying out cash dividends which are considered part of the firm's "legal capital," measured by the par value of common stock or the par value plus paid-in capital in excess of par.
 - b. *Contractual constraints* limit the firm's ability to pay dividends according to the restrictive covenants in a loan agreement.
 - c. *Internal constraints* are the corporation's own cash limitations.

- d. *Growth prospects* limit the amount of cash dividends since the firm needs to direct all available funds to finance capital expenditures.
- e. *Owner considerations* take into account factors which lead to a dividend policy favorably affecting the majority of owners. Examples are the tax status of the stockholder, his or her other investment opportunities, and ownership dilution, each of which can direct the firm toward a high or low dividend payout policy.
- f. *Market considerations* are the perceptions of the stockholders and their response to the dividend policy, which may indirectly affect the stock price.

13-6 With a *constant-payout-ratio dividend policy*, the firm pays out a certain percentage of earnings each period. A *regular dividend policy* is a fixed dollar dividend payment each period. The amount of this payment may be increased over the long run in response to proven increases in earnings. *low-regular-and-extra dividend policy* pays a constant dollar or regular dividend in each period; in periods with especially high earnings, an "extra" dividend is paid.

While the constant-payout ratio policy results in dividend variability and owner uncertainty, the regular dividend policy and low-regular-and-extra dividend policy reduce owner uncertainty by fulfilling their dividend expectation each period. Both the regular dividend and the low-regular-and-extra dividend policies provide good signals to investors.

13-7 A *stock dividend* is a dividend paid in the form of stock made to existing owners. Although stock dividends are more costly to issue than cash dividends, the advantages generally outweigh these costs. Stock dividends are a means of giving the owners something without having to use cash. Generally, a firm that is growing rapidly and needs internal financing to perpetuate this growth uses stock dividends.

The stockholder's assumption that he or she will break even in five years with a 20 percent stock dividend is incorrect. A stock dividend does not mean an increase in value of holdings; the per-share value decreases in proportion to the dividend and the investor's holdings remain the same in terms of both value and percentage ownership.

13-8 A *stock split* is a method of increasing the number of shares belonging to each shareholder. A stock split reduces the par value of stock outstanding and increases the number of shares outstanding. A *reverse stock split* is exactly the opposite of a stock split. The par value is increased and the number of shares outstanding is reduced. Neither type of split has any effect on a firm's financial structure but can be viewed as a change in accounting values. Normally, (reverse) stock splits are made when the firm believes its stock price is too (low) high to be actively traded. A *stock dividend* works the same as a stock split except that the ratio of new shares to old shares is lower. For example, a common stock split is 2 for 1. A stock dividend may be a 10% dividend, having the same effect as a 1.1 for 1 split.

13-9 *Repurchasing shares* in order to redistribute excess cash to owners is a way of passing cash directly to the shareholders who sell their shares back to the firm. The advantage of a stock repurchase is the tax deferral allowed the stockholder. If a cash dividend were paid, the owner would have to pay ordinary income taxes, whereas an increase in market value of the stock due to the repurchase will not be taxed until the owner sells the shares. If earnings remain constant, the result of a repurchase is to raise the per share earnings on those shares remaining outstanding since there will be fewer shares having a claim on the same amount of earnings. Since it would take fewer total shares to own the same firm, the value of each share would rise accordingly. In other words, the repurchase or retirement of common stock can be viewed as a

type of reverse dilution, since reducing the number of shares outstanding increases the earnings per share and market value of stock.

SOLUTIONS TO PROBLEMS**13-1 LG 1: Dividend Payment Procedures**

- a.
- | | <u>Debit</u> | <u>Credit</u> |
|-------------------------|--------------|---------------|
| Retained earnings (Dr.) | \$330,000 | |
| Dividends payable (Cr.) | | \$330,000 |
- b. Ex dividend date is Thursday, July 6.
- c.
- | | | | |
|------|-----------|-------------------|-------------|
| Cash | \$170,000 | Dividends payable | \$ 0 |
| | | Retained earnings | \$2,170,000 |
- d. The dividend payment will result in a decrease in total assets equal to the amount of the payment.
- e. Notwithstanding general market fluctuations, the stock price would be expected to drop by the amount of the declared dividend on the ex dividend date.

13-2 LG 1: Dividend Payment

- 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. Her return would be the same under either scenario. She would simply be trading off the \$0.80 dividend for capital gains if she bought the stock ex-dividend.

13-3 LG 2: Residual Dividend Policy

- a. *Residual dividend policy* means that the firm will consider its investment opportunities first. If after meeting these requirements there are funds left, the firm will pay the residual out in the form of dividends. Thus, if the firm has excellent investment opportunities, the dividend will be smaller than if investment opportunities are limited.

b. **Proposed**

Capital budget	\$2,000,000	\$3,000,000	\$4,000,000
Debt portion	800,000	1,200,000	1,600,000
Equity portion	1,200,000	1,800,000	2,400,000
Available retained earnings	\$2,000,000	\$2,000,000	\$2,000,000

Part 4 Long-Term Financial Decisions

Dividend	800,000	200,000	0
Dividend payout ratio	40%	10%	0%

- c. The amount of dividends paid is reduced as capital expenditures increase. Thus, if the firm chooses larger capital investments, dividend payment will be smaller or nonexistent.

13-4 LG 3: Dividend Constraints

- a. Maximum dividend: $\frac{\$1,900,000}{400,000} = \4.75 per share
- b. Largest dividend without borrowing: $\frac{\$160,000}{400,000} = \0.40 per share
- c. In **a**, cash and retained earnings each decrease by \$1,900,000.
In **b**, cash and retained earnings each decrease by \$160,000.
- d. Retained earnings (and hence stockholders' equity) decrease by \$80,000.

13-5 LG 3: Dividend Payment Procedures

- a. Maximum dividend: $\frac{\$40,000}{25,000} = \1.60 per share
- b. A \$20,000 decrease in cash and retained earnings is the result of an \$0.80 per share dividend.
- c. Cash is the key constraint, because a firm cannot pay out more in dividends than it has in cash, unless it borrows.

13-6 LG 4: Low-Regular-and-Extra Dividend Policy

a.	<u>Year</u>	<u>Payout %</u>		<u>Year</u>	<u>Payout %</u>			
	1998	25.4		2001	22.9			
	1999	23.3		2002	20.8			
	2000	17.9		2003	16.7			
b.		25%	Actual		25%	Actual		
	<u>Year</u>	<u>Payout</u>	<u>Payout</u>	<u>\$ Diff.</u>	<u>Year</u>	<u>Payout</u>	<u>Payout</u>	<u>\$ Diff.</u>
	1998	\$0.49	.50	0.01	2001	0.55	.50	- 0.05
	1999	0.54	.50	- 0.04	2002	0.60	.50	- 0.10
	2000	0.70	.50	- 0.20	2003	0.75	.50	- 0.25

- c. In this example the firm would not pay any extra dividend since the actual dividend did not fall below the 25% minimum by \$1.00 in any year. When the “extra” dividend is not paid due to the \$1.00 minimum, the extra cash can be used for additional investment by placing the funds in a short-term investment account.
- d. If the firm expects the earnings to remain above the EPS of \$2.20 the dividend should be raised to \$0.55 per share. The 55 cents per share will retain the 25% target payout but allow the firm to pay a higher

regular dividend without jeopardizing the cash position of the firm by paying too high of a regular dividend.

13-7 LG 4: Alternative Dividend Policies

a.	<u>Year</u>	<u>Dividend</u>	<u>Year</u>	<u>Dividend</u>
	1994	\$0.10	1999	\$1.28
	1995	0.00	2000	1.12
	1996	0.72	2001	1.28
	1997	0.48	2002	1.52
	1998	0.96	2003	1.60

b.	<u>Year</u>	<u>Dividend</u>	<u>Year</u>	<u>Dividend</u>
	1994	\$1.00	1999	\$1.10
	1995	1.00	2000	1.20
	1996	1.00	2001	1.30
	1997	1.00	2002	1.40
	1998	1.00	2003	1.50

c.	<u>Year</u>	<u>Dividend</u>	<u>Year</u>	<u>Dividend</u>
	1994	\$0.50	1999	\$0.66
	1995	0.50	2000	0.50
	1996	0.50	2001	0.66
	1997	0.50	2002	1.14
	1998	0.50	2003	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.

13-8 LG 4: Alternative Dividend Policies

a.	<u>Year</u>	<u>Dividend</u>	<u>Year</u>	<u>Dividend</u>
	1996	\$0.22	2000	\$0.00
	1997	0.50	2001	0.60
	1998	0.30	2002	0.78
	1999	0.53	2003	0.70

b.	<u>Year</u>	<u>Dividend</u>	<u>Year</u>	<u>Dividend</u>
	1996	\$0.50	2000	\$0.50
	1997	0.50	2001	0.50
	1998	0.50	2002	0.60
	1999	0.50	2003	0.60

c.	<u>Year</u>	<u>Dividend</u>	<u>Year</u>	<u>Dividend</u>
	1996	\$0.50	2000	\$0.50
	1997	0.50	2001	0.62
	1998	0.50	2002	0.84
	1999	0.53	2003	0.74

Part 4 Long-Term Financial Decisions

d.	<u>Year</u>	<u>Dividend</u>	<u>Year</u>	<u>Dividend</u>
	1996	\$0.50	2000	\$0.50
	1997	0.50	2001	0.62
	1998	0.50	2002	0.88
	1999	0.53	2003	0.78

- e.** Part **a.** uses a constant-payout-ratio dividend policy, which will yield low or no dividends if earnings decline or a loss occurs. Part **b.** uses a regular dividend policy, which minimizes the owners' uncertainty of earnings. Part **c.** uses a low-regular-and-extra dividend policy, giving investors a stable income which is necessary to build confidence in the firm. Part **d.** still provides the stability of Plans **b.** and **c.** but allows for larger future dividend growth.

13-9 LG 5: Stock Dividend–Firm

	a. 5% Stock Dividend	b. (1) 10% Stock Dividend	b. (2) 20% Stock Dividend
Preferred Stock	\$100,000	\$100,000	\$100,000
Common Stock (xx,xxx shares @\$2.00 par)	21,000 ¹	22,000 ²	24,000 ³
Paid-in Capital in Excess of Par	294,000	308,000	336,000
Retained Earnings	<u>85,000</u>	<u>70,000</u>	<u>40,000</u>
Stockholders' Equity	\$500,000	\$500,000	\$500,000

¹ 10,500 shares² 11,000 shares³ 12,000 shares

- c. Stockholders' equity has not changed. Funds have only been redistributed between the stockholders' equity accounts.

13-10 LG 5: Cash versus Stock Dividend

a.	Cash Dividend			
	<u>\$0.01</u>	<u>\$0.05</u>	<u>\$0.10</u>	<u>\$0.20</u>
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	<u>316,000</u>	<u>300,000</u>	<u>280,000</u>	<u>240,000</u>
Stockholders' Equity	\$1,016,000	\$1,000,000	\$980,000	\$940,000

b.	Stock Dividend			
	<u>1%</u>	<u>5%</u>	<u>10%</u>	<u>20%</u>
Preferred Stock	\$100,000	\$100,000	\$100,000	\$100,000
Common Stock (xxx,xxx 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	<u>304,000</u>	<u>240,000</u>	<u>160,000</u>	<u>0</u>
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.

13-11 LG 5: Stock Dividend–Investor

- a. $EPS = \frac{\$80,000}{40,000} = \2.00
- b. $\text{Percent ownership} = \frac{400}{40,000} = 1.0\%$
- c. Percent ownership after stock dividend: $440 \div 44,000 = 1\%$; stock dividends maintain the same ownership percentage. They do not have a real value.
- d. Market price: $\$22 \div 1.10 = \20 per share
- e. Her proportion of ownership in the firm will remain the same, and as long as the firm's earnings remain unchanged, so, too, will her total share of earnings.

13-12 LG 5: Stock Dividend–Investor

- a. $EPS = \frac{\$120,000}{50,000} = \2.40 per share
- b.
- $\text{Percent ownership} = \frac{500}{50,000} = 1.0\%$
- His proportionate ownership remains the same in each case

- c. $\text{Market price} = \frac{\$40}{1.05} = \$38.10$

$$\text{Market price} = \frac{\$40}{1.10} = \$36.36$$

The market price of the stock will drop to maintain the same proportion, since more shares are being used.

- d. $EPS = \frac{\$2.40}{1.05} = \2.29 per share

$$EPS = \frac{\$2.40}{1.10} = \$2.18 \text{ per share}$$

- e. Value of holdings: \$20,000 under each plan.
As long as the firm's earnings remain unchanged, his total share of earnings will be the same.

- f. The investor should have no preference because the only value is of a psychological nature. After a stock split or dividend, however, the stock price tends to go up faster than before.

13-13 LG 6: Stock Split–Firm

- a. CS = \$1,800,000 (1,200,000 shares @ \$1.50 par)
- b. CS = \$1,800,000 (400,000 shares @ \$4.50 par)
- c. CS = \$1,800,000 (1,800,000 shares @ \$1.00 par)
- d. CS = \$1,800,000 (3,600,000 shares @ \$0.50 par)
- e. CS = \$1,800,000 (150,000 shares @ \$12.00 par)

13-14 LG 5, 6: Stock Split versus Stock Dividend-Firm

- a. There would be a decrease in the par value of the stock from \$3 to \$2 per share. The shares outstanding would increase to 150,000. The common stock account would still be \$300,000 (150,000 shares at \$2 par).
- b. The stock price would decrease by one-third to \$80 per share.
- c. Before stock split: \$100 per share (\$10,000,000 ÷ 100,000)
After stock split: \$66.67 per share (\$10,000,000 ÷ 150,000)
- d. (a) A 50% stock dividend would increase the number of shares to 150,000 but would not entail a decrease in par value. There would be a transfer of \$150,000 into the common stock account and \$5,850,000 in the paid-in capital in excess of par account from the retained earnings account, which decreases to \$4,000,000.

(b) The stock price would change to approximately the same level.

(c) Before dividend: \$100 per share (\$10,000,000 ÷ 100,000)
After dividend: \$26.67 per share (\$4,000,000 ÷ 150,000)
- e. Stock splits cause an increase in the number of shares outstanding and a decrease in the par value of the stock with no alteration of the firm's equity structure. However, stock dividends cause an increase in the number of shares outstanding without any decrease in par value. Stock dividends cause a transfer of funds from the retained earnings account into the common stock account and paid-in capital in excess of par account.

13-15 LG 5, 6: Stock Dividend versus Stock Split–Firm

- a. A 20% stock dividend would increase the number of shares to 120,000 but would not entail a decrease in par value. There would be a transfer of \$20,000 into the common stock account and \$580,000 [(\$30 - \$1) x 20,000] in the paid-in capital in excess of par account from the retained earnings account. The per-share earnings would decrease since net income remains the same but the number of shares outstanding increases by 20,000.

$$\text{EPS}_{\text{stock dividend}} = \frac{\$360,000}{120,000} = \$3.00$$

Part 4 Long-Term Financial Decisions

- b.** There would be a decrease in the par value of the stock from \$1 to \$0.80 per share. The shares outstanding would increase to 125,000. The common stock account would still be \$100,000 (125,000 shares at \$0.80 par). The per-share earnings would decrease since net income remains the same but the number of shares outstanding increases by 25,000.

$$\text{EPS}_{\text{stock split}} = \frac{\$360,000}{125,000} = \$2.88$$

- c.** The option in part b, the stock split, will accomplish the goal of reducing the stock price while maintaining a stable level of retained earnings. A stock split does not cause any change in retained earnings but reduces the price of the shares in the same proportion as the split ratio.
- d.** The firm may be restricted in the amount of retained earnings available for dividend payments, whether cash or stock dividends. Stock splits do not have any impact on the firm's retained earnings.

13-16 LG 6: Stock Repurchase

a. Shares to be repurchased = $\frac{\$400,000}{\$21.00} = 19,047$ shares

b $\text{EPS} = \frac{\$800,000}{380,953} = \2.10 per share

If 19,047 shares are repurchased, the number of common shares outstanding will decrease and earnings per share will increase.

- c.** Market price: $\$2.10 \times 10 = \21.00 per share
- d.** The stock repurchases results in an increase in earnings per share from \$2.00 to \$2.10.
- e.** The pre-repurchase market price is different from the post-repurchase market price by the amount of the cash dividend paid. The post-repurchase price is higher because there are fewer shares outstanding.

Cash dividends are taxable to the stockholder. If the firm repurchases stock, taxes on the increased value resulting from the purchase are deferred until the shares are sold.

13-17 LG 6: Stock Repurchase

a. Shares outstanding needed = $\frac{(\$1,200,000 \times .40)}{\$2.00} = \frac{\$480,000}{\$2.00} = 240,000$

b. $300,000 - 240,000 = 60,000$ shares to repurchase

CHAPTER 13 CASES**Establishing General Access Company's Dividend Policy and Initial Dividend**

This case requires the student to evaluate the alternative dividend payout policies that a firm may follow. They need to evaluate the alternatives with regard to both the financial facts of the firm as well as the stockholders' dividend preferences.

- a. The company has experienced positive and increasing earnings since it went public in 1997. Management believes that EPS should remain stable over the next three years ($\pm 10\%$). This stable earning pattern is conducive to having some form of regular dividend payout policy. Either the *regular dividend policy* or the *low-regular-and-extra dividend policy* would be consistent with the earnings stability. The *constant payout ratio* could work but may be unacceptable to the shareholders due to the nature of the industry. Competition in the Internet access industry is strong. Should General Access experience volatility in their earnings they would pass this volatility on to its shareholders through dividend changes.
- b. The *low-regular-and-extra dividend policy* should be adopted for two reasons. First, this approach provides the dividend stability consistent with the firm's earnings stability and growth. Secondly, the firm has the flexibility to increase or decrease dividends when earnings vacillate due to economic or competitive conditions.
- c. There are six factors the board should consider before setting an initial dividend policy:
 1. *Legal constraints* – Are there legal restrictions that come into play that will prohibit the firm from paying a dividend? A common constraint in most states is the firm cannot pay dividends out of "legal capital," which is normally measured as the par value of common stock, plus perhaps any paid-in capital in excess of par.
 2. *Contractual constraints* – Loan covenants may be in place that place some prohibitions on the ability of the firm to pay dividends.
 3. *Internal constraints* – This factor addresses whether or not the firm has the available funds to make the cash dividend payments. Although legally a firm can borrow to pay dividends, most lenders are reluctant to make such loans.
 4. *Growth prospects* – If the firm needs the funds to invest in new or ongoing projects they may wish to retain earnings to fund the investments. The firm can pay dividends and then raise funds externally, but often these external sources are more expensive and/or increase the risk of the firm.
 5. *Owner considerations* – Although it is impossible to maximize the wealth of every single owner, managers should consider the tax status, owners' other wealth opportunities, and ownership dilution possibilities when making the dividend decision.
 6. *Market consideration* – How will market participants view the dividend decision? This factor is concerned with the information content of the decision to institute a dividend payout where none previously existed.
- d. Ms. McNeely will want to set a dividend that is high enough to inform stockholders of the financial strength of the firm. She needs to be cautious of not setting it too high and forcing the firm into a dividend cut possibility in future years. The volatility of EPS is an important consideration. A worst-case scenario for EPS volatility is minus 10%. EPS could be as low as \$3.33, but could rise to \$4.07 in a best-case outcome. The most likely scenario growth of 5% results in an EPS of \$3.89. She should also look at the dividend policies of competitor firms. What is their current policy and what policy did they follow when they first started paying out a dividend? Investor's may partially form their expectations from the decisions of these competitors.

Part 4 Long-Term Financial Decisions

- e. The initial dividend should be approximately \$0.72 per share per year (\$0.18 per quarter). General Access has had EPS in excess of \$0.72 since 1995, the year after they went public. This amount is a payout ratio of about 20% based on 2000 EPS. This is a substantial initial dividend, which is probably what is needed by the market since investors in General Access have experienced rapid share price appreciation. To start with too low of a dividend would signal a decline in the investment potential of the firm. To make the dividend higher may place financial stress on the firm in the near future should profits decline. Even if the firm's EPS declined 10% to \$3.33 the payout ratio would increase to only 21.6%. If better than expected earnings are experienced, the firm can declare the extra dividend to share this wealth with stockholders.

INTEGRATIVE CASE 4

O'GRADY APPAREL COMPANY

Integrative Case 4 O'Grady Apparel Company is an exercise in evaluating the cost of capital and available investment opportunities. The student must calculate the component costs of financing, long-term debt, preferred stock, and common stock equity, and determine the weighted average cost of capital (WACC). Investment decisions must be made between competing projects. Finally, the student must reanalyze the case given a new, more highly leveraged capital structure.

a. Cost of financing sources

Debt:

$$k_d = \frac{I + \frac{\$1,000 - N_d}{n}}{\frac{N_d + \$1,000}{2}}$$

$$k_d = \frac{\$120 + \frac{\$1,000 - \$970}{10}}{\frac{\$970 + \$1,000}{2}} = \frac{\$123}{\$985} = 12.5\%$$

$$k_i = k_d \times (1 - t)$$

$$k_i = .125 \times (1 - .4)$$

$$k_i = .075 \text{ or } 7.5\%$$

$$k_j = .18 \times (1 - t)$$

$$k_j = .18 \times (1 - .4)$$

$$k_j = .108 \text{ or } 10.8\%$$

Preferred Stock:

$$k_p = D_p \div N_p$$

$$k_p = \$10.20 \div \$57$$

$$k_p = .179 \text{ or } 17.9\%$$

Common Stock Equity:

$$k_s = (D_1 \div P_0) + g$$

$$k_s = (\$1.76 \div \$20) + .15$$

$$k_s = .238 \text{ or } 23.8\%$$

$$k_n = (D_1 \div N_n) + g$$

$$k_n = (\$1.76 \div \$16) + .15$$

$$k_n = .26 \text{ or } 26\%$$

b. (1) Breaking Points: $BP_j = AF_j \div W_j$

$$\text{Long-term debt} = \frac{\$700,000}{.25} = \$2,800,000$$

Part 4 Long-Term Financial Decisions

Preferred stock: Not applicable

$$\text{Common stock equity} = \frac{\$1,300,000}{.65} = \$2,000,000$$

(2)

Ranges of Total New financing	Cost of Component Source of Financing		
	Long-term Debt	Preferred Stock	Common Stock Equity
\$0 - \$2,000,000	7.5%	17.9%	23.8%
\$2,000,001 - \$2,800,000	7.5%	17.9%	26.0%
Above \$2,800,000	10.8%	17.9%	26.0%

(3) **Weighted average cost of capital:** $k_a = (w_j \times k_j) + (w_p \times k_p) + (w_s \times k_r \text{ or } n)$

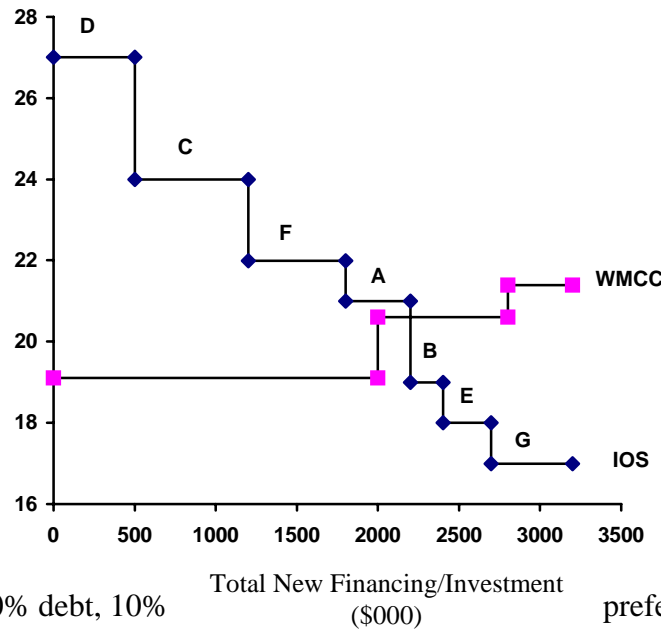
Range	Calculation	WACC
\$0 - \$2,000,000	$(.25 \times .075) + (.10 \times .179) + (.65 \times .238)$	= .191 or 19.1%
\$2,000,001 - \$2,800,000	$(.25 \times .075) + (.10 \times .179) + (.65 \times .260)$	= .206 or 20.6%
Above \$2,800,000	$(.25 \times .108) + (.10 \times .179) + (.65 \times .260)$	= .217 or 21.4%

c.

IOS and WMCC

(2) Projects D, accepted rate of weighted

Weighted Average Cost of Capital and IRR (%) to include the cost of same will points at average and the



C, F, and A should be since each has an internal return greater than the average cost of capital.

d. (1) Changing the capital structure more debt while keeping each financing source the change both the breaking which the weighted cost of capital changes WACC.

Breaking points for 50% debt, 10% preferred stock, and 40% common stock:

$$\text{Long - term debt} = \frac{\$700,000}{.50} = \$1,400,000$$

$$\text{Common stock equity} = \frac{\$1,300,000}{.40} = \$3,250,000$$

WACC for new capital structure:

Range	Calculation	WACC
\$0 - \$1,400,000	$(.50 \times .075) + (.10 \times .179) + (.40 \times .238)$	$= .151$ or 15.1%
\$1,400,001 - \$3,250,000	$(.50 \times .108) + (.10 \times .179) + (.40 \times .238)$	$= .167$ or 16.7%
Above \$3,250,000	$(.50 \times .108) + (.10 \times .179) + (.40 \times .260)$	$= .176$ or 17.6%

Since the total for all investment opportunities is \$3,200,000, the lowest IRR is 17%, and the cost of capital below \$3,250,000 is less than 17% (15.1% and 16.7%), all 7 projects are acceptable.

(2) For any set of investment opportunities, the more highly leveraged capital structure will result in accepting more projects. However, a more highly leveraged capital structure increases the firm's financial risk.

e. (1) O'Grady follows a constant-payout-ratio dividend policy. For each of the years 2001 through 2003 the firm paid out a constant 40% of earnings. The same payout percent is included in the projections for 2004. Given the firm's growth in sales and earnings it would seem appropriate to not continue the constant payout. O'Grady's could use the internally generated funds to help finance some of the growth.

(2) They should change their dividend policy to the regular dividend policy. They can maintain the constant dividend as earnings increase, freeing up some cash for investment. If earnings continue to increase the constant dividend policy could later be converted to a low-regular-and-extra

dividend policy. Retaining more of the income will increase the breakpoint for common stock equity financing. This higher breakpoint will cause a shift downward in the WMCC schedule. O'Grady's should be able to undertake additional investment opportunities and further increase shareholders' wealth.