

**Achievement of Market-Friendly Initiatives and Results Program
(AMIR 2.0 Program)**

Funded by U.S. Agency for International Development

Equity Analysis, Portfolio Management, and Real Estate

Practice Exam I and Solutions

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Contract No. 278-C-00-02-00210-00

2003

EQUITY ANALYSIS, PORTFOLIO MANAGEMENT & REAL ESTATE

1. The XYZ's Corporation's balance sheets for 1995 and 1994 are as follows (in millions of dollars)

	1995	1994
Cash	\$ 21	\$ 45
Marketable Securities	0	33
Receivables	90	66
Inventories	225	159
Total Current assets		
	\$ 336	\$ 303
Gross fixed assets	450	225
less: accumulated depreciation	123	78
Net fixed assets	327	147
Total assets	\$ 663	\$ 450
Accounts payable	54	45
Notes payable	9	45
Accruals	45	21
Total current liabilities	108	111
Long-term debt	78	24
Common stock	192	114
Retained earnings	285	201
Total long-term capital		
	\$ 555	\$ 339
Total claims	\$ 663	\$ 450

Additionally, XYZ's 1995 income statement is as follows (in millions of dollars):

Sales	\$ 1,365
Cost of goods sold	888
General expenses	282
EBIT (earnings before int. & taxes)	195
Interest	10
EBT (earnings before taxes)	185
Taxes (40%)	74
Net income	\$ 111

A. **Calculate** the firm's dividend payout ratio in 1995. If the firm wishes to maintain a constant dollar dividend, **explain** what impact, if any, this policy will have on the firm's payout ratio.

(5 minutes)

In 1995, the industry achieved the following:

Profit Margin	6.52%
Asset Turnover	1.82
Equity Multiplier	1.77
ROE	21.0%

B. **Construct** XYZ's 1995 DuPont equation and **discuss** XYZ's expense control, asset utilization, and debt utilization? **Calculate** the firm's sustainable growth and **explain** its meaning.

(10 minutes)

C. **Construct** the firm's 1995 statement of cash flows. **Explain** the firm's largest expenditure and where the money came from for that expenditure.

(15 minutes)

2. John Smith, CFA, is currently analyzing ABC's financial forecast for the coming year. The firm's income statement and balance sheet for 1995 are given below (in thousands of dollars):

Income Statement

Sales	\$ 7,500
Cost of goods sold	6,000
Administrative expenses	780
EBIT	720
Interest expense	120
Earnings before taxes	600
Taxes (40%)	240
Net income	360
Dividends (30% payout)	108
Addition to retained earnings	252

Balance Sheet

Cash	\$ 300	Accounts payable	\$ 220
Receivables	500	Accruals	100
Inventory	1,000	Notes payable	250
Current assets	1,800	Current liabilities	550
Net fixed assets	4,000	Long-term debt	2,400
		Total debt	2,950
		Common Stock	2,000
		Retained earnings	850
Total assets	\$ 5,800	Total claims	\$ 5,800

ABC was operating at full capacity last year. The company's marketing department is forecasting a 20 percent sales increase in the coming year, and the firm does not plan to increase its dollar dividend. Smith has requested that you, his assistant, help with the company's 1995 financial analysis.

- A. Assuming that 1996 ratios will equal the 1995 ratios, **prepare** the firm's 1995 pro forma income statement. **Calculate** values for projected net income, dividends, and addition to retained earnings. **Explain** the most important factor affecting the pro forma income statement.

(15 minutes)

- B. Use the percent of sales method to **prepare** the firm's 1996 pro forma balance sheet. **Calculate** the external funding requirement. **Discuss** the assumptions embedded in the percent-of-sales approach.

(20 minutes)

3. **Criticize** this statement: "Income real estate is a perfect hedge against inflation." **Explain** the importance of duration in determining the inflation hedging potential of an investment in real estate. **Comment** on the necessary assumptions.

(10 minutes)

4. **Discuss** and **justify** an equity investment strategy based on turning points in the business cycle. **Critically comment** on this investment approach.

(10 minutes)

5. One measure of the risk/return relationship is the "reward-to-variability" ratio, S . **Show** how this measure is calculated, graphically demonstrate its importance and explain its meaning. **Comment** on how you would use S for both expectational (before-the-fact) and performance evaluation (after-the-fact) analysis.

(20 minutes)

6. In spite of the theoretical argument that dividend policy should be irrelevant, the fact remains that many investors like high dividends. If this preference exist, a firm can boost its share price by increasing its dividend-payout ratio. **Evaluate** this argument.

(10 minutes)

7. A stock has a beta of .9. You expect this stock to return 13 percent over the next year. If you estimate the risk-free rate to be 8 percent and the market risk premium to be 6 percent,

explain whether you are optimistic or pessimistic about this stock relative to market expectations (**show** calculations).

(10 minutes)

8. **Identify** which of the following statements are true about the efficient-market hypothesis:
- It implies perfect forecasting ability
 - It implies that prices reflect all available information
 - It implies an irrational market
 - It implies that prices do not fluctuate
 - It results from keen competition among investors
9. **Discuss** 3 main differences between corporate debt and equity.

(10 minutes)

10. Smith Manufacturing is a nongrowth company in the 34 percent tax bracket. Smith's perpetual EBIT is \$1.2 million per year. The firm's pretax cost of debt is 8 percent and its interest expense per year is \$200,000. You estimate that the unlevered cost of Smith's equity is 12 percent. **Calculate** the total value of Smith. **Explain** what your calculation implies about the correct level of debt. **Discuss** whether your conclusion is correct.

(20 minutes)

11. A common stock pays a current dividend of \$1.00. The dividend is expected to grow at a 14 percent rate for the next three years; then it will grow at 5 percent in perpetuity. You estimate the risk-free rate equals 5 percent, the beta equals 1.2, and the market required rate equals 13 percent. **Calculate** the intrinsic value of this stock.

(15 minutes)

12. A real estate investment with a value of \$500,000 has the following expected net operating incomes (NOIs): **Calculate** the expected overall capitalization rate for this investment (**show** calculations).

State of World	NOI	Probability
1	\$50,000	.05
2	\$55,000	.80
3	\$65,000	.15

(10 minutes)

13. The Suzuki company has just paid a cash dividend of \$2 per share. You determine that investors require a 16 percent return from investments with risk comparable to Suzuki. If you expect the dividend to grow at a steady 8 percent per year forever, **calculate** the intrinsic value of Suzuki's stock. Given your expectations, **calculate** the price of Suzuki's stock at the end of five years.

(15 minutes)

14. In problem 13, **calculate** the price of Suzuki stocks if the dividend is expected to grow at 20 percent for the next three years and then at 8 percent per year thereafter forever.

(10 minutes)

15. Given the following data, **identify** the risk premium for large stocks, the risk premium for small stocks, the default premium, the real rate of return, and the liquidity premium for long-term government bonds.

Series	Return
Large company stocks	10.3%
Small company stocks	12.4%
Long-term corporate bonds	5.6%
Long-term government bonds	5.0%
U.S. T-bills	3.7%
Inflation	3.1

(5 minutes)

16. Assume you wish to calculate the Markowitz efficient frontier for a 3-asset portfolio. **Determine** how many statistical estimates you will need. Assume you wish to calculate the Sharpe efficient frontier, **determine** how many estimates you will need. **Explain** the difference in your conclusions.

(5 minutes)

17. **List** and **discuss** three different multiples you could use to estimate the value of a closely held stock.

(5 minutes)

18. **Describe** a methodology for constructing an equity portfolio using mutual funds for an investor based on style analysis.

(5 minutes)

19. You are advising a client who wishes to protect herself against inflation by investing in real estate. She asks you about the historical positive correlation between real estate returns and inflation. **Explain** this relationship to her.

(5 minutes)

20. Capital Structure and Homemade Leverage: The Jorgensen Corporation is debating whether to convert its current all-equity capital structure to one that is 40 percent debt.

Currently; there are 100 shares outstanding and the price per share is \$120. EBIT is expected to remain at \$400 per year forever. The interest rate on the debt is 8 percent, and there are no taxes. Ms. Lyndi owns 10 shares.

- a. What is Ms. Lyndi's cash flow under the current capital structure?
- b. What will Ms. Lyndi's cash flow be under the proposed capital structure? Assume that she retains all 10 shares.
- c. Suppose Jorgensen does convert, but Ms. Lyndi prefers the current capital structure. Show how she could unlever her investment to re-create the original capital structure
- d. Explain why the capital structure Jorgensen chooses is irrelevant.

(10 minutes)

21. If a portfolio has a positive investment in every asset, can the standard deviation on the portfolio be less than on every asset in the portfolio? What about the portfolio beta?

(5 minutes)

22. In broad terms, why is some risk diversifiable? Why are some risks nondiversifiable? Does it follow that an investor can control the level of unsystematic risk in a portfolio, but not the level of systematic risk?

(5 minutes)

23. Announcements and Security Prices Suppose that the government announces that, based on a just-completed survey, the growth rate in the economy is likely to be 4 percent in the coming year, as compared to 6 percent for the year just completed. Would security prices increase, decrease, or stay the same following this announcement?

(5 minutes)

24. Bozok Corporation is evaluating an extra dividend versus a share repurchase. In either case, \$1,000 would be spent. Current earnings are \$5 per share, and the stock currently sells for \$100 per share. There are 20 shares outstanding. Ignore taxes and other imperfections in answering the first two questions.

- a. Evaluate the two alternatives in terms of the effect on the price per share of the stock and shareholder wealth.
- b. In the real world, which of these actions would you recommend? Why?

(10 minutes)

25. What is the chief drawback to a strict residual dividend policy? Why is this a problem? How does a compromise policy work? How does it differ from a strict residual policy?

(5 minutes)

EQUITY SECURITIES, PORTFOLIO MANAGEMENT & REAL ESTATE

1. A. 1994 addition to retained earnings = \$285 million - \$201 million = \$84 million.

Total dividend payment = \$111 million - \$84 million = \$27 million

Payout ratio = \$27 million/\$111 million = .243 = 24.3%.

A constant dollar dividend policy implies that the payout ratio will vary depending on the volatility of the firm's earnings. Only when earnings are constant from year to year, which is highly unlikely, will the constant dollar dividend policy lead to a constant payout ratio.

B. Profit margin = \$111 mil/\$1,365 mil = .0813 = 8.13%

Total asset turnover - \$1,365 mil/\$663 mil = 2.06

Equity multiplier = \$663 mil/(\$192 mil + \$285 mil) = 1.39.

Therefore, the firm's 1994 DuPont equation is:

Profit margin (PM) x Asset Turnover (ATO) x Leverage = ROE

8.13% x 2.06 x 1.39 = 23.27%

Alternatively, ROE can be computed directly as \$111/\$477 = 23.27%

The DuPont analysis indicates that:

1. the firm has lower expenses than the average in the industry
2. the firm is using its assets more productively than average
3. the firm uses less debt in its capital structure than the average firm

The firm's sustainable growth equals ROE times the Retention Rate, or

$g = 23.27\% \times (1 - 24.3\%)$

$g = 17.6\%$

Sustainable growth is an estimate the firm's future growth in sales. If all the firm's financial ratios remain constant, sustainable growth will also equal growth in earnings, dividends, equity, and assets.

C.

Account	Source	Use
Cash	\$ 24	
Marketable securities	33	
Receivables		24
Inventories		66
Gross fixed assets		225
Accumulated depreciation	45	
Accounts payable	9	
Notes payable		36
Accruals	24	
Long-term debt	54	
Common stock	78	
Retained earnings	84	
	\$ 351	\$ 351

**2003 Preparation for Level II
Equity Analysis, Portfolio Management, and Real Estate
Practice Exam 1 and Solutions**

Cash Flow from Operations	
Net income	\$ 111
Additions (sources)	
Depreciation	45
Increase in accruals	24
Increase in payables	9
Subtractions (uses)	
Increase in receivables	(24)
Increase in inventories	(66)
Net cash from operations	\$ 99
Cash Flow from Investments	
Purchase fixed assets	(225)
Cash Flow from Financing Activities	
Sale of marketable securities	33
Sale of long-term debt	54
Sale of common stock	78
Pay common dividends	(27)
Reduce notes payable	(36)
Net cash from financing	\$ 102
Increase (decrease) in cash	(\$ 24)

The firm's largest expenditure was for fixed assets (\$225) with most of the money coming from Long-term debt (\$54), Common stock (\$78), and Retained earnings (\$84).

2A. Pro forma income statement is:

Sales	\$9,000
Cost of goods sold (80% of sales)	7,200
Administrative expenses (10.4%)	936
Earnings before interest and taxes (EBIT)	864
Interest expense	120
Earnings before taxes	744
Taxes (40%)	298
Net income	\$ 446
Dividends	108
Addition to retained earnings	338

Notes:

1. Forecasted sales = \$7,500 (1.2) = \$9,000.
2. The cost of goods sold and administrative expenses are expected to remain at their current percentages of sales.

3. Interest and dividend payments will be a function of the financing requirements. For now, as a first approximation, they are held at their 1994 levels.

The most important factor affecting the pro forma income statement is the sales forecast. Without an accurate sales forecast, earnings, dividends and retained earnings estimates will be unreliable that, in turn, will affect the pro forma balance sheet.

B. Pro forma balance sheet is:

	% of Sales	Forecast based on Sales (\$9,000)
Cash	4.00%	\$ 360
Receivables	6.67%	600
Inventory	13.33%	1,200
Current assets	24.00%	2,160
Net fixed assets	53.33%	4,800
Total assets	77.33%	\$ 6,960
Accounts payable	2.67%	240
Accruals	1.33%	120
Notes payable	n.a.	250
Current liabilities	n.a.	610
Long-term debt	n.a.	2,400
Total debt	n.a.	3,010
Common stock	n.a.	2,000
Retained earnings	n.a.	1,188
Total claims	n.a.	6,198

Notes:

1. Balance sheet items that vary directly with sales as a percentage of last year's sales. Items that do not change automatically with sales are labeled "n.a." for not applicable.
2. Since the firm was operating at full capacity, it is assumed that any sales increase must be supported by fixed asset additions, and hence net fixed assets are shown as a percent of last year's sales.
3. For items listed as not applicable, last year's figures were entered. At least one of these accounts will have to be changed later in the analysis, most likely Notes payable.
4. Retained earnings = \$850,000 + \$338,000 = \$1,188,000 (see pro forma income statement).

The external funding requirement equals the difference in the pro forma total asset and total claim values: \$6,960,000 - \$6,198,000 = \$762,000

The percentage-of-sales method requires two important assumptions:

1. Balance sheet accounts which change automatically with sales vary in direct proportion to changes in sales.
 2. The latest balance sheet levels were optimal for the latest sales.
3. Income real estate is usually not a perfect hedge against inflation. If it were, the internal rate of return (IRR) of the investment would be perfectly, positively correlated with inflation. The

main factor determining whether income real estate is a good hedge against inflation is duration. The shorter the investment's duration, the better it can pass through inflation to the renter. Alternatively, the longer the investment's duration more difficult it is to act as an inflation hedge.

A short duration investment implies that rent adjusts quickly to inflation. The assumption is that the terminal value also adjusts at the same rate. On the other hand, long duration implies that the investor can recoup inflation losses only at some time in the future. Although he or she may fully regain all historical losses, the investor still loses the time value of money. Taxes and amortization tend to complicate the process although both are relatively unimportant. Tax law changes reduced the tax shelter component of an investment's IRR, and amortization accrues rather slowly.

4. An equity investment strategy based on turning points in the business cycle is a timing strategy. Historically, the stock market has led the business cycle by approximately 8 months. Thus, if you know where the economy is at any point in the business cycle, you should be able to exploit this knowledge to your advantage. Such a timing strategy requires a significant amount to study of economic data. This strategy suggests that you reduce your equity holdings approximately 8 months prior to the peak of the business cycle. Likewise, it suggests that you increase your equity holdings approximately 3 months prior to the trough of the business cycle.

The problem with this strategy is the uncertainty associated with your knowledge. Additionally, the relationship between the stock market and the business cycle has been highly variable in the past. Finally, you have no assurance that the historical relationship will repeat itself in the future.

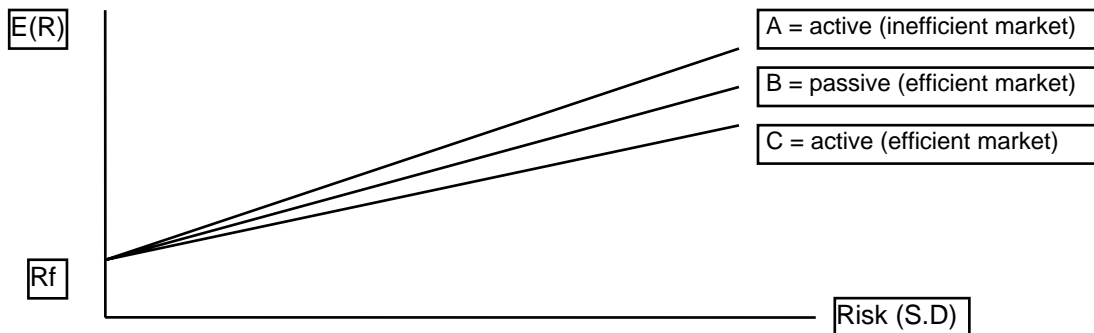
5. The S measure (before-the-fact) is calculated as: $S = [E(R_p) - R_f] / S.D. \text{ portfolio}$
 where

$E(R)$ = expected return on the portfolio

R_f = riskfree rate

S.D. portfolio = expected standard deviation of portfolio

S (before-the-fact) measures the expected excess reward (risk premium) per unit of risk (standard deviation of portfolio). You would calculate an S measure for each portfolio you are considering and select the one with the highest value. This means you would calculate S measures for each active strategy you are considering together with an S measure for the relevant passive strategy in making your decision. A graph for 3 different portfolios is



You can use S as a performance measurement (after-the-fact) in a similar way. Instead of using expectations in the calculation, however, you would use actual performance data. You would compare your portfolio S to the S of a benchmark portfolio you and your client agreed to beforehand to evaluate your performance on a risk-adjusted basis.

6. Unless there is an unsatisfied high dividend clientele, a firm cannot improve its share price by switching policies. If the market is in equilibrium, the number of people who desire high dividend payout stocks should exactly equal the number of such stocks available. The supplies and demands of each clientele will be exactly met in an equilibrium. If the market is not in equilibrium, the supply of high dividend payout stocks may be less than the demand. Only in such a situation could a firm benefit from a policy shift.
7. According to the SML, the return of this stock should be 13.4% [= .08 + .9 (.06)]. You expect only a 13% return, so you are pessimistic.
8. a) false: market efficiency implies prices reflect all available information, but it does not imply certain knowledge. Many pieces of information that are available and reflected in prices are uncertain. Efficiency of markets does not eliminate that uncertainty and therefore does not imply perfect forecasting ability. b) true: market efficiency exists when prices reflect all available information. To be weak form efficient, the market must incorporate all historical data into prices. Under the semi-strong form, the market incorporates all publicly available information in addition to the historical data. In a strong form, prices reflect all publicly and privately available information. c) false: market efficiency implies that market participants are rational. Rational people will immediately act upon new information and they will bid prices up or down to reflect that information. d) false: Since in efficient markets prices reflect all available information, prices will fluctuate whenever new information becomes available. e) true: Without competition among investors, information could not be readily transmitted. Without quick transmission of information, prices would not reflect the information immediately and markets would not be efficient.

9.

	Debt	Equity
Repayment is an obligation of the firm	Yes	No
Grants ownership of the firm	No	Yes
Provides a tax shield	Yes	No
Liquidation will result if not paid	Yes	No

10. a) in this MM world with no financial distress costs, the value of the levered firm is given by
 $V_L = V_U + T_c B$. The value of the unlevered firm is $V = [EBIT (1 - T_c)]/r_o$. The market value of the debt of Smith is $B = \$200,000/.08 = \$2,500,000$. Therefore, the total value of the firm is
 $V = \$1,200,000 (1 - .34)/.12 + (\$2,500,000)(0.34) = \$7,450,000$
- b) Since debt adds to the value of the firm, it imposes that the firm should be financed entirely with debt if it wishes to maximize its value.
- c) This conclusion is incorrect because it does not consider the costs of financial distress or other agency costs that might offset the positive contribution of the debt.

11. $D1 = \$1.00 (1.14) = \1.14
 $D2 = D1(1.14) = \$1.30$
 $D3 = D2 (1.14) = \$1.48$
 $D4 = D3(1.05) = \$1.55$
 $P3 = \$1.55 / (.15 - .05) = \15.50
 $Price = \$1.14/1.15 + 1.30/1.15^2 + 1.48/1.15^3 + 15.50/1.15^3$
 $= \$13.14$

12.

State of World	Cap Rate (= NOI/Value)
1	.10 (= 50,000/500,000)
2	.11 (= 55,000/500,000)
3	.13 (= 65,000/500,000)

Expected overall cap rate = $.05(.10) + .8(.11) + .15(.13)$
 $= 11.25\%$

13. $P_0 = \$2 (1.08) / (.16 - .08)$
 $= \$27$

You could calculate the price of Suzuki stock in year 5 in two different ways to arrive at the same answer:

First, $P_5 = D_5 (1.08) / .16 - .08$
 $= \$39.67$

Second, $P_5 = P_0 (1.08)$
 $= \$27 (1.08)^5$
 $= \$39.67$

Be familiar with both ways.

14. $P_0 = \text{present value } (D1 + D2 + D3 + P3)$
 $= [(2.00 \times 1.2) / 1.16] + [(2.00 \times 1.2^2) / 1.16^2] + [(2.00 \times 1.2^3) / 1.16^3] + \{(2.00 \times 1.2^3) \times (1.08) / (.16 - .08)\} / 1.16^3$
 $= \$36.31$

15.

Risk premium large company stocks = $10.3\% - 3.7\% = 6.6\%$

Risk premium small company stocks = $12.4\% - 3.7\% = 8.7\%$

Default premium = $5.6\% - 5.0\% = .6\%$

Real rate of return = $3.7\% - 3.1\% = .6\%$

Liquidity premium for long-term government bonds = $5.0\% - 3.7\% = 1.3\%$

16. For the Markowitz efficient frontier (curve), you will need 3 expected return estimates, 3 variance estimates, and $n(n-1)/2 = 3(3-1)/2 = 3$ covariance or correlation estimates for a total of 9 statistical estimates. For the Sharpe efficient frontier (straight line), you will need 3 expected return estimates and 3 beta estimates for a total of 6 statistical company estimates. Additionally, you will need a risk-free estimate and a market risk premium estimate. This analysis shows that the Sharpe efficient frontier requires fewer statistical estimates than the Markowitz efficient frontier. The important assumption for the Sharpe efficient frontier is that the market portfolio, M, captures all pairwise correlations of securities contained in M and that these correlations are reflected in beta, which measures the relationship between returns of the individual stock and M. The Sharpe model also assumes that the market portfolio lies on the Markowitz efficient frontier. As the number of securities in the portfolio increases, the difference between the number of statistical estimates needed to implement each model increases.
17. You could use p/e, p/cash flow, and p/book value. You would calculate these multiples for a number of actively traded stocks of similar risk, most likely take the average, and apply the average to the earnings, cash flow and book value of the closely held stock.
18. A methodology you could use would be to select 9 different equity mutual funds differentiated by size (large-cap, mid-cap, and small-cap) and growth/value (growth, value, and blend). That is, one fund would be a large-cap value fund, another would be a large-cap growth fund and a third would be a large-cap blend of value and growth fund. The next three funds would be mid-cap funds and the final three would be small cap funds.
19. The historical positive relationship shows that real estate returns have increased with inflation. As inflation increases, landlords have been able to increase rents enough to cover the higher costs of maintaining the property such as electricity and repairs.
- 20.
- a. CF to Ms. Lyndi = $(400/100)(10) = \$40$
 - b. $V = 100(120) = \$12,000$
 $D = 0.4(12,000) = \$4,800$
Shares outstanding = $100 - 4,800/120 = 60$ shares
 $NI = 400 - 0.08(4,800) = \16
 $EPS = 16/60 = \$.267$
CF to Ms. Lyndi = $.267(10) = \$2.67$
 - c. Sell 4 shares and lend the proceeds.
Earnings for 6 shares = \$1.60
Interest = $4(120)(.08) = \$38.40$
Total CF = $1.60 + 38.40 = \$40$
 - d. The capital structure is irrelevant because the shareholders can create their own leverage position which will give them the payoff they desire.
21. Yes, the standard deviation can be less, but the beta cannot be less than the smallest beta in the portfolio.

22. Some of the risk in holding any asset is unique to the asset in question. By investing in a variety of assets, this unique risk is eliminated at little cost. On the other hand, there are some risks that affect all investments and cannot be costlessly avoided. In other words, systematic risk can be controlled, but only by a costly reduction in expected returns.

23. It depends on what expectations were. If the market had "priced" securities for 4% growth, then there would be no change. If, for example, the market had expected zero growth, then the prices would, in all likelihood, increase.

24.a. Cash dividend: $DPS = 1,000/20 = \$50$ per share
New stock price = $100 - 50 = \$50$ per share Wealth per share = $50 + 50 = \$100$
Stock repurchase: $1,000/100$ 10 shares will be repurchased
Share price before repurchase = share price after repurchase = $\$100$
Wealth per share = $\$100$

Therefore, neither a cash dividend nor a stock repurchase will affect the stockholders' wealth.

b. A share repurchase would seem to be the preferred course of action. Only those shareholders who wish to sell will do so, and, as a result, no one is forced to pay taxes.

25. The chief drawback to a strict dividend policy is the variability in dividend payments. This is a problem because investors tend to want a somewhat predictable cash flow. Also, if there is information content to dividend announcements, then the firm may be inadvertently telling the market that it is expecting a downturn when it cuts a dividend, when, in reality, its prospects are very good. In a compromise policy, the firm maintains a relatively constant dividend. It increases dividends only when it expects earnings to remain higher so it can continue to pay the higher dividend, and it lowers the dividend only if it absolutely has to.