

8.5 Financial Measures

57. A firm earning a profit can increase its return on investment by

- A. Increasing sales revenue and operating expenses by the same dollar amount.
- B. Decreasing sales revenues and operating expenses by the same percentage.
- C. Increasing investment and operating expenses by the same dollar amount.
- D. Increasing sales revenues and operating expenses by the same percentage.

Answer (D) is correct. (CMA, adapted)

REQUIRED: The means by which a profitable company can increase its return on investment (ROI).

DISCUSSION: ROI equals business unit profit divided by average total assets. If a company is already profitable, increasing sales and expenses by the same percentage will increase ROI. For example, if a company has sales of \$100 and expenses of \$80, its operating income is \$20. Given average total assets of \$100, ROI is 20% ($\$20 \div \100). If sales and expenses both increase 10% to \$110 and \$88, respectively, operating income increases to \$22. ROI will then be 22% ($\$22 \div \100).

Answer (A) is incorrect. Increasing sales and expenses by the same dollar amount will not change income or ROI. Answer (B) is incorrect. Decreasing revenues and expenses by the same percentage will reduce income and lower ROI. Answer (C) is incorrect. Increasing investment and operating expenses by the same dollar amount will lower ROI. The higher investment increases the denominator, and the increased expenses reduce the numerator.

58. Which one of the following statements pertaining to the return on investment (ROI) as a performance measurement is false?

- A. When the average age of assets differs substantially across segments of a business, the use of ROI may not be appropriate.
- B. ROI relies on financial measures that are capable of being independently verified, while other forms of performance measures are subject to manipulation.
- C. The use of ROI may lead managers to reject capital investment projects that can be justified by using discounted cash flow models.
- D. The use of ROI can make it undesirable for a skillful manager to take on troubleshooting assignments such as those involving turning around unprofitable divisions.

Answer (B) is correct. (CMA, adapted)

REQUIRED: The false statement about ROI as a performance measurement.

DISCUSSION: Return on investment is the key performance measure in an investment center. ROI is a rate computed by dividing a business unit's profits by its average total assets. ROI is therefore subject to the numerous possible manipulations of the income and investment amounts. For example, a manager may choose not to invest in a project that will yield less than the desired rate of return, or (s)he may defer necessary expenses.

Answer (A) is incorrect. ROI can be misleading when the quality of the investment base differs among segments. Answer (C) is incorrect. Managers may reject projects that are profitable (a return greater than the cost of capital), but would decrease ROI. For example, the managers of a segment with a 15% ROI may not want to invest in a new project with a 10% ROI, even though the cost of capital might be only 8%. Answer (D) is incorrect. The use of ROI does not reflect the relative difficulty of tasks undertaken by managers.

59. Listed below is selected financial information for the Western Division of the Hinzel Company for last year.

Account	Amount (thousands)
Average working capital	\$ 625
General and administrative expenses	75
Net sales	4,000
Average plant and equipment	1,775
Cost of goods sold	3,525

If Hinzel treats the Western Division as an investment center for performance measurement purposes, what is the return on investment (ROI) for last year?

- A. 34.78%
- B. 22.54%
- C. 19.79%
- D. 16.67%

Answer (D) is correct. (CMA, adapted)

REQUIRED: The before-tax ROI for an investment center.

DISCUSSION: An investment center is responsible for revenues, expenses, and invested capital. Given average plant and equipment of \$1,775 and average working capital of \$625, the average total assets is \$2,400. Operating profit is \$400 ($\$4,000$ sales – $\$3,525$ cost of goods sold – $\$75$ general expenses). ROI equals business unit profit divided by average total assets. The Western Division's is therefore 16.67% ($\$400 \div \$2,400$).

Answer (A) is incorrect. This percentage results from subtracting working capital from plant and equipment in calculating average total assets. Answer (B) is incorrect. This percentage fails to include average working capital in total assets. Answer (C) is incorrect. This percentage results from not subtracting general and administrative expenses in the calculation of business unit profit.

60. One approach to measuring divisional performance is return on investment. Return on investment is expressed as operating income

- A. Divided by the current year's capital expenditures plus cost of capital.
- B. Minus imputed interest charged for invested capital.
- C. Divided by fixed assets.
- D. Divided by total assets.

61. In evaluating an investment center, top management should concentrate on

- A. Dollar sales.
- B. Net income.
- C. Profit percentages.
- D. Return on investment.

62. Which one of the following will not improve return on investment if other factors are constant?

- A. Decreasing expenses or assets.
- B. Increasing selling prices.
- C. Increasing sales volume while holding fixed expenses constant.
- D. None of the answers is correct.

63. To properly motivate divisional management, the divisional ROIs should be

- A. Equal.
- B. Greater in the less profitable divisions to motivate those divisions to achieve higher ROIs.
- C. Lower in more profitable divisions in which motivation is unnecessary.
- D. Different based upon strategic goals of the firm.

Answer (D) is correct. (CMA, adapted)

REQUIRED: The method of calculating return on investment (ROI).

DISCUSSION: ROI is calculated by dividing a business unit's operating income by average total assets. It is a key performance measure of an investment center. Total assets available is the measure that assumes the manager will use all assets without regard to financing.

Answer (A) is incorrect. ROI is based on all assets, not just current investment expenditures. Answer (B) is incorrect. The calculation of ROI does not adjust for imputed interest on invested capital. Answer (C) is incorrect. The denominator would not be limited to fixed assets.

Answer (D) is correct. (Publisher, adapted)

REQUIRED: The area on which management should concentrate in evaluating an investment center.

DISCUSSION: Each investment center of a business should be evaluated based upon return on investment (ROI) to judge operating performance. In essence, ROI is the business unit's operating income stated as a percentage of average total assets (i.e., resources deployed).

Answer (A) is incorrect. Dollar sales do not give a measure of operating performance based on resources required. Answer (B) is incorrect. Net income is an after-tax amount, i.e., it only appears on the corporate, not the business unit, income statement. Answer (C) is incorrect. Profit percentages do not give a measure of operating performance based on resources required.

Answer (D) is correct. (Publisher, adapted)

REQUIRED: The decision that does not improve return on investment.

DISCUSSION: ROI equals business unit profit divided by average total assets. Increasing operating income (e.g., by decreasing expenses or by increasing prices or sales volume) or decreasing the investment base improves ROI. Hence, any of the actions listed increases the return on investment. Management and the accounting profession are very concerned with classification of expenses and assets and other decisions involving the accounting for these items to achieve a proper calculation of return on investment.

Answer (A) is incorrect. Decreasing expenses or assets while holding other factors constant improves return on investment. Answer (B) is incorrect. Increasing selling prices while holding other factors constant improves return on investment. Answer (C) is incorrect. Increasing sales volume while holding other factors constant improves return on investment.

Answer (D) is correct. (Publisher, adapted)

REQUIRED: The best motivational philosophy regarding the ROIs of different divisions.

DISCUSSION: Each division within a firm should have an ROI based on the strategic goals of the firm consistent with its competitive environment.

Answer (A) is incorrect. Equal goals should not be set owing to differences in competitive environment, the strategic goals of the firm, and risk. Answer (B) is incorrect. Using greater divisional ROIs in the less profitable divisions to motivate those divisions to achieve higher ROIs would not necessarily improve divisional performance. Answer (C) is incorrect. Lower divisional ROIs in more profitable divisions in which motivation is unnecessary would likely suboptimize divisional performance.

64. Which one of the following items would most likely not be incorporated into the calculation of a division's investment base when using the residual income approach for performance measurement and evaluation?

- A. Fixed assets employed in division operations.
- B. Land being held by the division as a site for a new plant.
- C. Division inventories when division management exercises control over the inventory levels.
- D. Division accounts payable when division management exercises control over the amount of short-term credit used.

65. The segment margin of an investment center after deducting the imputed interest on the assets used by the investment center is known as

- A. Return on investment.
- B. Residual income.
- C. Operating income.
- D. Return on assets.

66. The imputed interest rate used in the residual income approach to performance evaluation can best be described as the

- A. Average lending rate for the year being evaluated.
- B. Historical weighted-average cost of capital for the company.
- C. Target return on investment set by the company's management.
- D. Average return on investments for the company over the last several years.

Answer (B) is correct. (*CMA, adapted*)

REQUIRED: The item most likely not incorporated into the calculation of a division's investment base.

DISCUSSION: The evaluation of an investment center is based upon the return generated by the assets employed. These assets include plant and equipment, inventories, and receivables. Most likely, however, an asset, such as land, that is being held by the division as a site for a new plant would not be included in the investment base because it is not currently being used in operations. Total assets in use rather than total assets available is preferable when the investment center has been forced to carry idle assets.

Answer (A) is incorrect. Fixed operating assets are controlled by the division manager and contribute to profits.

Answer (C) is incorrect. Inventories are operating assets that contribute to profits and are controlled by the division manager.

Answer (D) is incorrect. The level of accounts payable is an operating decision that should be considered in the evaluation of the division manager.

Answer (B) is correct. (*CMA, adapted*)

REQUIRED: The segment margin of an investment center after imputed interest on the assets used has been deducted.

DISCUSSION: Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. The target rate is usually the weighted-average cost of capital. The advantage of using residual income rather than ROI is that residual income emphasizes maximizing an amount instead of a percentage. Managers are encouraged to accept projects with returns exceeding the cost of capital even if the investments reduce the percentage ROI.

Answer (A) is incorrect. Return on investment computation does not subtract imputed interest on capital used from the investment base. Answer (C) is incorrect. Operating income by itself does not reveal how efficiently invested capital was employed. Answer (D) is incorrect. Return on assets does not subtract imputed interest on capital used from the investment base.

Answer (C) is correct. (*CMA, adapted*)

REQUIRED: The true statement about the imputed interest rate used in the residual income approach to performance evaluation.

DISCUSSION: Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. The rate used is sometimes a target return set by management but is often equal to the weighted average cost of capital. Some entities prefer to measure managerial performance in terms of the amount of residual income rather than the percentage ROI because the firm will benefit from expansion as long as residual income is earned.

Answer (A) is incorrect. The cost of equity capital also must be incorporated into the imputed interest rate. Answer (B) is incorrect. The current weighted-average cost of capital must be used. Answer (D) is incorrect. The rate should be based on cost of capital, not investment returns of preceding years.

67. The imputed interest rate used in the residual income approach for performance measurement and evaluation can best be characterized as the

- A. Historical weighted average cost of capital for the company.
- B. Marginal after-tax cost of new equity capital.
- C. Average return on investment that has been earned by the company over a particular period.
- D. Target return on investment set by management.

68. James Webb is the general manager of the Industrial Product Division, and his performance is measured using the residual income method. Webb is reviewing the following forecasted information for his division for next year:

Category	Amount (thousands)
Working capital	\$ 1,800
Revenue	30,000
Plant and equipment	17,200

If the imputed interest charge is 15% and Webb wants to achieve a residual income target of \$2,000,000, what will costs have to be in order to achieve the target?

- A. \$9,000,000
- B. \$10,800,000
- C. \$25,150,000
- D. \$25,690,000

69. The basic objective of the residual income approach to performance measurement and evaluation is to have a division maximize its

- A. Return on investment rate.
- B. Imputed interest rate charge.
- C. Cash flows.
- D. Income in excess of a desired minimum return.

Answer (D) is correct. (CMA, adapted)

REQUIRED: A definition of the imputed interest rate used in the residual income approach to performance measurement.

DISCUSSION: Normally, management sets a target rate that all managers are expected to achieve. Anything above or below this normal return will catch the attention of higher management.

Answer (C) is correct. (CMA, adapted)

REQUIRED: The maximum costs consistent with meeting a residual income target.

DISCUSSION: Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. If a manager has \$19,000,000 of invested capital (\$17,200,000 of plant and equipment + \$1,800,000 of working capital), a 15% imputed interest charge equals \$2,850,000. Adding \$2,000,000 of residual income to this opportunity cost of capital results in a target profit of \$4,850,000. This profit can be achieved if costs are \$25,150,000 (\$30,000,000 revenue – \$4,850,000 profit).

Answer (A) is incorrect. This level of cost would result in a residual income greater than \$2,000,000. Answer (B) is incorrect. This level of cost would result in a residual income greater than \$2,000,000. Answer (D) is incorrect. The amount of \$25,690,000 results from subtracting working capital from plant and equipment in determining invested capital.

Answer (D) is correct. (CMA, adapted)

REQUIRED: The basic objective of the residual income approach to performance measurement and evaluation.

DISCUSSION: Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. Some firms prefer to measure managerial performance in terms of the amount of residual income rather than the percentage ROI. The principle is that the firm is expected to benefit from expansion as long as residual income is earned. Using a percentage ROI approach, expansion might be rejected if it lowered ROI even though residual income would increase.

Answer (A) is incorrect. ROI does not have to be maximized under the residual income approach. Answer (B) is incorrect. Maximizing the imputed interest rate charge would diminish the residual return. Answer (C) is incorrect. The residual income method is based on accrual-basis operating income rather than cash flows.

70. After investing in a new project, a company discovered that its residual income remained unchanged. Which one of the following must be true about the new project?

- A. The net present value of the new project must have been negative.
- B. The return on investment of the new project must have been less than the firm's cost of capital.
- C. The return on investment of the new project must have been equal to the firm's cost of capital.
- D. The net present value of the new project must have been positive.

71. When comparing the residual income of several investment centers, the validity of comparisons may be destroyed by

- A. Peculiarities of each investment center.
- B. Consistent use of an imputed interest rate.
- C. Common amounts of invested capital for each investment center.
- D. None of the answers is correct.

72. REB Service Co. is a computer service center. For the month, REB had the following operating statistics:

Sales	\$450,000
Operating income	25,000
Net profit after taxes	8,000
Total assets	500,000
Shareholders' equity	200,000
Cost of capital	6%

Based on the above information, which one of the following statements is true? REB has a

- A. Return on investment of 4%.
- B. Residual income of \$(5,000).
- C. Return on investment of 1.6%.
- D. Residual income of \$(22,000).

Answer (C) is correct. (CMA, adapted)

REQUIRED: The true statement about residual income given a set of circumstances.

DISCUSSION: Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. If residual income remained unchanged, then the return on the project must have been the same as the firm's cost of capital.

Answer (A) is incorrect. A negative NPV would have decreased residual income. Answer (B) is incorrect. A return less than the cost of capital would have decreased residual income. Answer (D) is incorrect. A positive NPV would increase residual income.

Answer (A) is correct. (CIA, adapted)

REQUIRED: The factor destroying the validity of comparisons of the residual income of several investment centers.

DISCUSSION: Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. The theory is that earning an income greater than residual income indicates that expansion is desirable. However, comparisons of investment centers based on residual income may be misleading because of differences in products, markets, costs, and local conditions.

Answer (B) is incorrect. Use of the same imputed interest rate provides a consistent objective against which each investment can be measured. Answer (C) is incorrect. Common amounts of invested capital would eliminate a major factor causing differences in residual income. Answer (D) is incorrect. Comparisons of investment centers based on residual income may be misleading because of peculiarities of each investment center (i.e., differences in products, markets, costs, and local conditions).

Answer (B) is correct. (CMA, adapted)

REQUIRED: The true statement about the company's performance.

DISCUSSION: Return on investment is commonly calculated by dividing business unit profit by total assets available. Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. The rate used is ordinarily the weighted-average cost of capital. Because REB has assets of \$500,000 and a cost of capital of 6%, it must earn \$30,000 on those assets to cover the cost of capital. Given that operating income was only \$25,000, it had a negative residual income of \$5,000.

Answer (A) is incorrect. Although the firm's return on equity investment was 4%, its return on all funds invested was 5% (\$25,000 pretax operating income ÷ \$500,000). Answer (C) is incorrect. ROI is commonly based on before-tax income. Answer (D) is incorrect. The amount of \$(22,000) equals the difference between net profit after taxes and targeted income.

73. Residual income is a better measure for performance evaluation of an investment center manager than return on investment because

- A. The problems associated with measuring the asset base are eliminated.
- B. Desirable investment decisions will not be neglected by high-return divisions.
- C. Only the gross book value of assets needs to be calculated.
- D. The arguments about the implicit cost of interest are eliminated.

Questions 74 and 75 are based on the following information. Edith Carolina, president of the Deed Corporation, requires a minimum return on investment of 8% for any project to be undertaken by her company. The company is decentralized, and leaves investment decisions up to the discretion of the division managers as long as the 8% return is expected to be realized. Michael Sanders, manager of the Cosmetics Division, has had a return on investment of 14% for his division for the past 3 years and expects the division to have the same return in the coming year. Sanders has the opportunity to invest in a new line of cosmetics which is expected to have a return on investment of 12%.

74. If the Deed Corporation evaluates managerial performance using residual income based on the corporate minimum required rate of return, what will be the preference for taking on the proposed cosmetics line by Edith Carolina and Michael Sanders?

	<u>Carolina</u>	<u>Sanders</u>
A.	Accept	Reject
B.	Reject	Accept
C.	Accept	Accept
D.	Reject	Reject

75. If the Deed Corporation evaluates managerial performance using return on investment, what will be the preference for taking on the proposed cosmetics line by Edith Carolina and Michael Sanders?

	<u>Carolina</u>	<u>Sanders</u>
A.	Accept	Reject
B.	Reject	Accept
C.	Accept	Accept
D.	Reject	Reject

Answer (B) is correct. (CMA, adapted)

REQUIRED: The reason residual income is a better measure of performance evaluation than return on investment.

DISCUSSION: Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. The advantage of using residual income rather than percentage ROI is that residual income emphasizes maximizing a dollar amount instead of a percentage. Managers of divisions with a high ROI are encouraged to accept projects with returns exceeding the cost of capital even if those projects reduce the division's ROI.

Answer (A) is incorrect. The methods use the same asset base. Answer (C) is incorrect. The methods use the same asset base. Answer (D) is incorrect. Use of the residual income method requires a knowledge of the cost of capital; thus, arguments about the implicit cost of interest may escalate with use of the residual income method.

Answer (C) is correct. (CMA, adapted)

REQUIRED: The preferences of the company and the division manager regarding a project with an ROI greater than the minimum return but less than the normal return if the manager is evaluated based on residual income.

DISCUSSION: Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. The rate is usually the weighted-average cost of capital. Some entities prefer to measure managerial performance in terms of the amount of residual income rather than the percentage ROI. The principle is that the entity is expected to benefit from expansion as long as residual income is earned. Using a percentage ROI approach, expansion might be rejected if it lowered ROI, even though residual income would increase. Using residual income, both Carolina and Sanders would accept the new project because residual income will increase if a 12% return is earned when the target ROI is only 8%.

Answer (A) is correct. (CMA, adapted)

REQUIRED: The preferences of the company and the division manager regarding a project with an ROI greater than the minimum return but less than the normal return.

DISCUSSION: A company with an 8% ROI threshold should obviously accept a project yielding 12% because the company's overall ROI would increase. The manager being evaluated on the basis of ROI who is already earning 14% will be unwilling to accept a 12% return on a new project because the overall ROI for the division would decline slightly. This absence of goal congruence suggests a weakness in ROI-based performance evaluation.

76. Managerial performance can be measured in many different ways, including return on investment (ROI) and residual income. A good reason for using residual income instead of ROI is that

- A. Residual income can be computed without regard to identifying an investment base.
- B. Goal congruence is more likely to be promoted by using residual income.
- C. Residual income is well understood and often used in the financial press.
- D. ROI does not take into consideration both the investment turnover ratio and return-on-sales percentage.

Answer (B) is correct. (CMA, adapted)

REQUIRED: The good reason for using the residual income method instead of ROI.

DISCUSSION: Residual income is a significant refinement of the return on investment concept because it forces business unit managers to consider the opportunity cost of capital. The rate used is usually the weighted average cost of capital. Residual income may be preferable to ROI because an entity will benefit from expansion as long as residual income is earned. Using only ROI, managers might be tempted to reject expansion that lowered ROI, even though residual income would increase. Thus, the residual income method promotes the congruence of a manager's goals with those of the overall entity. Actions that tend to benefit the company will also tend to improve the measure of the manager's performance.

Answer (A) is incorrect. An investment base is need to calculate residual income. Answer (C) is incorrect. ROI and residual income calculations generally require the use of unpublished financial information. Answer (D) is incorrect. Both measures consider the same items.

8.6 The Balanced Scorecard

77. The balanced scorecard provides an action plan for achieving competitive success by focusing management attention on critical success factors. Which one of the following is **not** one of the perspectives on the business into which critical success factors are commonly grouped in the balanced scorecard?

- A. Competitor business strategies.
- B. Financial performance.
- C. Internal business processes.
- D. Employee innovation and learning.

Answer (A) is correct. (CMA, adapted)

REQUIRED: The item not a perspective on the business as used on a balanced scorecard.

DISCUSSION: A typical balanced scorecard classifies critical success factors and measures into one of four perspectives on the business: financial, customer satisfaction, internal business processes, and learning and growth.

Answer (B) is incorrect. Financial performance measures are among the tools used in a typical balanced scorecard. Answer (C) is incorrect. A typical balanced scorecard contains critical success factors and measures focused on internal business processes. Answer (D) is incorrect. Employee innovation and learning is one of the perspectives on the business commonly used in a balanced scorecard.

78. Using the balanced scorecard approach, an organization evaluates managerial performance based on

- A. A single ultimate measure of operating results, such as residual income.
- B. Multiple financial and nonfinancial measures.
- C. Multiple nonfinancial measures only.
- D. Multiple financial measures only.

Answer (B) is correct. (Publisher, adapted)

REQUIRED: The nature of the balanced scorecard approach.

DISCUSSION: The trend in managerial performance evaluation is the balanced scorecard approach. Multiple measures of performance permit a determination as to whether a manager is achieving certain objectives at the expense of others that may be equally or more important. These measures may be financial or nonfinancial and usually include items in four categories: profitability; customer satisfaction; innovation; and efficiency, quality, and time.

79. On a balanced scorecard, which of the following would not be an example of a customer satisfaction measure?

- A. Market share.
- B. Economic value added.
- C. Response time.
- D. Customer retention.

Answer (B) is correct. (Publisher, adapted)

REQUIRED: The measure that is not an element of customer satisfaction on a balanced scorecard.

DISCUSSION: Customer satisfaction measures include market share, retention, response time, delivery performance, number of defects, and lead time. Economic value added, or EVA[®], is a profitability measure.

Answer (A) is incorrect. Market share is a customer satisfaction measure. Answer (C) is incorrect. Response time is a customer satisfaction measure. Answer (D) is incorrect. Customer retention is a customer satisfaction measure.