Chapter 25

PROFIT PERFORMANCE MEASUREMENTS AND INTRACOMPANY TRANSFER PRICING

MULTIPLE CHOICE

Question Nos. 12, 17, and 18 are AICPA adapted.
Question No. 10 is ICMA adapted.
Question Nos. 9, 11, and 14-16 are CIA adapted.

E **1.** **If profits are $20,000, sales are $100,000, and capital employed is $50,000, the capital-employed turnover rate would be:**

A. 4
B. 5
C. 0.40
D. 0.20
E. 2

SUPPORTING CALCULATION:

$100,000 ÷ $50,000 = 2

C **2.** **If profits are $100,000, sales are $500,000, and capital employed is $400,000, the rate of return on capital employed would be:**

A. 400%
B. 125%
C. 25%
D. 20%
E. 500%

SUPPORTING CALCULATION:

$100,000 ÷ $400,000 = 25%

D **3.** **The profit figure that is preferred in connection with the analysis of a division or department is:**

A. income before income tax
B. taxable profit
C. net income
D. operating income
E. net income exclusive of bond interest

A **4.** **All of the following are arguments that favor the use of the original cost basis for valuing plant assets for determining the investment base *except:***

A. depreciated values reflect the objective that the capital base should be maintained by replacing assets used up (depreciated) during the current period
B. nonuniformity of depreciation methods and differing ages of assets impedes comparison among plants
C. assets of manufacturing companies should be considered to be used on a continuing basis
D. accumulated depreciation is not deducted from the gross asset value of property because it represents retention of the funds required to keep the stockholders' original investment intact
E. plant assets are used to produce income over their entire life; therefore, the full cost is considered an investment until the assets are retired from use

C **5.** **A limitation to using the rate of return on capital employed for internal profit measurement would be that:**

A. managers are influenced to make decisions that are good for the company only in the long run; thus, they often miss current opportunities
B. none of the data required for allocating assets to segments are available in the accounting records
C. lack of agreement on the optimum rate of return might discourage managers who believe the rate is set at an unfair level
D. weaknesses with respect to the use or nonuse of individual assets, particularly inventories, would not be detected
E. the ratio cannot be used for measuring efficiency in managing the company or the division

A **6.** **Reporting income by divisions, where there are frequent purchases and sales among divisions, has been criticized because of the arbitrary nature of the:**

A. transfer prices
B. gross revenues assigned to products sold
C. return-on-capital-employed computations
D. depreciation methods used
E. product pricing methods

C **7.** **The transfer pricing method that is the best objective profitability and performance measurement is based on:**

A. cost
B. negotiated pricing
C. market pricing
D. return on capital employed
E. arbitrary methods

E **8.** **The transfer pricing method that allows managers the greatest degree of authority and control over the profit of their units is:**

A. market pricing
B. return on capital employed
C. arbitrary methods
D. cost
E. negotiated pricing

A **9.** **The return on investment (ROI) ratio measures:**
- **A. both asset turnover and earnings as a percentage of sales**
- **B. asset turnover and earnings as a percentage of sales, correcting for the effects of differing depreciation methods**
- **C. only asset turnover**
- **D. only earnings as a percentage of sales**
- **E. none of the above**

E **10.** **Return on investment (ROI) is a term often used to express income earned on capital invested in a business unit. A company's ROI would be increased if:**
- **A. sales decreased by the same dollar amount that expenses increased**
- **B. sales and expenses increased by the same percentage that total assets increased**
- **C. net profit margin on sales increased by the same percentage that total assets increased**
- **D. sales increased by the same dollar amount that expenses and total assets increased**
- **E. sales remained the same and expenses were reduced by the same dollar amount that total assets decreased**

C **11.** **Which of the following is the most valid reason for not using a cost plus transfer price between decentralized units of a company? A cost plus transfer price:**
- **A. does not reflect the excess capacity of the supplying unit**
- **B. is typically more costly to implement**
- **C. does not ensure the control of costs of a supplying unit**
- **D. is not available unless market-based prices are available**
- **E. all of the above**

B **12.** **In a decentralized company in which divisions may buy goods from one another, the transfer pricing system should be designed primarily to:**
- **A. minimize the degree of autonomy of division managers**
- **B. aid in the appraisal and motivation of managerial performance**
- **C. increase the consolidated value of inventory**
- **D. discourage division managers from buying from outsiders**
- **E. all of the above**

E **13.** **To avoid waste and maximize efficiency when transferring products among divisions in a competitive economy, a large diversified corporation should base transfer prices on:**
- **A. full cost**
- **B. replacement cost**
- **C. product cost**
- **D. variable cost**
- **E. market price**

A 14. A company has two divisions, A and B, each operated as a profit center. A charges B $35 per unit for each unit transferred to B. Other data follow:

A's variable cost per unit	**$ 30**	
A's fixed costs	**$ 10,000**	
A's annual sales to B	**5,000**	**units**
A's sales to outsiders	**50,000**	**units**

A is planning to raise its transfer price to $50 per unit. Division B can purchase units at $40 each from outsiders, but doing so would idle A's facilities now committed to producing units for B. Division A cannot increase its sales to outsiders. From the perspective of the company as a whole, from whom should Division B acquire the units, assuming B's market is unaffected?

A. Division A, in spite of the increased transfer price
B. outside vendors
C. Division A, but only at the variable cost per unit
D. Division A, but only until fixed costs are covered; then should purchase from outside vendors
E. none of the above

SUPPORTING CALCULATION:

Cost of buying outside	**$40/unit**
Incremental cost of making inside	**$30/unit**
Savings from buying inside	**$10/unit**

C 15. Given a competitive outside market for identical intermediate goods, what is the best transfer price, assuming all relevant information is readily available?

A. average cost of production
B. average cost of production plus average production department's allocated profit
C. market price of the intermediate goods
D. market price of the intermediate goods less average production department's allocated profit
E. none of the above

A 16. What is the most appropriate base to use in computing a return on investment for a business segment?

A. total segment assets employed
B. total segment assets employed less allocated liabilities of the company
C. current assets of the segment
D. noncurrent assets of the segment
E. none of the above

A 17. The calculation of a company's return on investment is affected by a change in:

	Capital Turnover	Profit Margin on Sales
A.	**yes**	**yes**
B.	**no**	**yes**
C.	**no**	**no**
D.	**yes**	**no**

B 18. The price that one division of a company charges another division for goods or services provided is called the:

A. market price
B. transfer price
C. outlay price
D. distress price
E. none of the above

D 19. The following data relate to the Happy Division of Euphoria, Inc.:

Sales	**$10,000,000**
Variable costs	**3,000,000**
Direct fixed costs	**5,000,000**
Invested capital	**2,000,000**
Capital charge	**12%**

The divisional residual income is:

A. $7,000,000
B. $240,000
C. $2,000,000
D. $1,760,000
E. none of the above

SUPPORTING CALCULATION:

($10,000,000 - $3,000,000 - $5,000,000) - ($2,000,000 x 12%) = $1,760,000

B 20. The following data relate to the Happy Division of Euphoria, Inc.:

Sales	**$10,000,000**
Variable costs	**3,000,000**
Direct fixed costs	**5,000,000**
Invested capital	**8,000,000**
Capital charge	**12%**

The divisional return on investment is:

A. 50%
B. 25%
C. 20%
D. 12%
E. none of the above

SUPPORTING CALCULATION:

($10,000,000 - $3,000,000 - $5,000,000) ÷ 8,000,000 = 25%

E **21.** **Common forms of management incentive compensation include all of the following, *except:***

A. **deferred compensation**
B. **stock options**
C. **stock appreciation rights**
D. **performance shares**
E. **all of the above are forms of management incentive compensation**

D **22.** **Generally, performance measurements and related incentive compensation plans should do all of the following, *except:***

A. **reward long-term performance**
B. **tie incentive compensation to achieving strategic goals**
C. **evaluate operating profits before gains from financial transactions**
D. **evaluate operating profits after deductions for the incremental amount of accelerated depreciation**
E. **all of the above should be done**

PROBLEMS

PROBLEM

1.
Rate of Return on Capital Employed, Using Depreciated Cost Method. Quik Energy Corp. has $1,500,000 in total assets. Plant and equipment have a book value of $600,000 (original cost, $800,000). There is a cash balance of $200,000, and accounts receivable total $250,000. The remainder of the assets is in the form of materials inventories. The company produces two products—Juicers and Blenders. Sales and production data are:

	Juicers	Blenders
Units sold	30,000	50,000
Sales price	$20	$33
Materials cost	8	16
Labor and overhead	6	8
Marketing and administrative expenses	4	6

All sales are on account. All overhead and marketing and administrative costs are variable and in the same proportion between products as labor costs. Plant and equipment are allocated on the basis of labor and overhead costs. Cash is allocated to products on the basis of the anticipated cost of goods sold. Inventory is allocated on the basis of materials cost.

Required: **Compute the rate of return on capital employed for each product and for the company as a whole, using the depreciated cost method. (Round allocation percentages and answers to the nearest whole percent.)**

SOLUTION

				Rate of Return on Capital Employed
Juicers	$ 60,000	÷ $ 409,000	=	15%
Blenders	$ 150,000	÷ $ 1,091,000	=	14%
Company	$ 210,000	÷ $ 1,500,000	=	14%

Additional computations:	Juicers	Blenders
Sales price	$ 20	$ 33
Less unit cost	18	30
Net income per unit	$ 2	$ 3
Multiplied by unit sales	x 30,000	x 50,000
Net income	$ 60,000	$ 150,000

Net income for the company $210,000

		Allocation of Capital	
Item	Allocation Basis	Total to Allocate	Total Basis
Cash	Cost of goods sold	$200,000	$1,620,000
			100%
Accounts receivable	Sales	250,000	2,250,000
			100%
Inventories	Materials cost	450,000	1,040,000
			100%
Plant and equipment	Labor and overhead cost	600,000	580,000
			100%

	Basis Used By		Cost Allocated To	
Item	Juicers	Blenders	Juicers	Blenders
Cash	$420,000	$1,200,000	$ 52,000	$ 148,000
	26%	74%		
Accounts receivable	600,000	1,650,000	67,500	182,500
	27%	73%		
Inventories	240,000	800,000	103,500	346,500
	23%	77%		
Plant and equipment	180,000	400,000	186,000	414,000
	31%	69%		
Total			$ 409,000	$ 1,091,000

Total for company $1,500,000

PROBLEM

2.

Percentage of Profit to Sales; Capital-Employed Turnover Rate; Rate of Return on Capital Employed. The president of Black Hills Mining Company compared the Copper Mining Division, the Zinc Mining Division, and the Nickel Mining Division, using the relevant data below:

	Copper Mining Division	Zinc Mining Division	Nickel Mining Division
Sales	**$ 5,000,000**	**$5,000,000**	**$5,000,000**
Division expenses	**4,000,000**	**4,000,000**	**4,900,000**
Capital employed	**20,000,000**	**2,000,000**	**2,000,000**

Required:

(1) Compute the percentage of profit to sales, the capital-employed turnover rate, and the rate of return on capital employed for the three divisions.

(2) Do the Copper Mining Division and the Nickel Mining Division have the same low rate of return on capital employed for the same reasons? Offer any suggestions for improving the various divisions' rates of return on capital employed.

SOLUTION

(1)

				Percentage of Profit to Sales
Copper Mining Division	**$ 1,000,000**	**÷**	**$5,000,000**	**20%**
Zinc Mining Division	**$ 1,000,000**	**÷**	**$5,000,000**	**20%**
Nickel Mining Division	**$ 100,000**	**÷**	**$5,000,000**	**2%**

				Capital-Employed Turnover Rate
Copper Mining Division	**$ 5,000,000**	**÷**	**$ 20,000,000**	**.25**
Zinc Mining Division	**$ 5,000,000**	**÷**	**$ 2,000,000**	**2.5**
Nickel Mining Division	**$ 5,000,000**	**÷**	**$ 2,000,000**	**2.5**

		Rate of Return on Capital Employed
Copper Mining Division	**20% x .25**	**5%**
Zinc Mining Division	**20% x 2.5**	**50%**
Nickel Mining Division	**2% x 2.5**	**5%**

(2)
No; although both Copper and Nickel have the same 5% rate of return on capital employed, it is for different reasons. Using the Zinc Division as a benchmark, Copper has an acceptable percentage of profit to sales ratio and an unacceptable capital-employed turnover rate. Nickel has an unacceptable percentage of profit to sales ratio and an acceptable capital-employed turnover rate.

Copper will best be able to improve its return on investment by reducing its assets employed. Nickel will best be able to improve its return on investment by cutting costs to increase its percentage of profit to sales.

PROBLEM

3.
Market-Based Transfer Pricing System vs. Standard Cost System. Corbin Cement Products sells 100,000 bags of cement each year at $10 per bag. Its plant has a capacity to produce 150,000 bags of cement per year; fixed costs related to the plant amount to $400,000 per year. Variable costs per bag are $5.

Cohoes Concrete Products, a subsidiary located in another city, uses cement, sand, and gravel to produce bags of concrete. One-half bag of cement is needed for each bag of concrete. At present, the bags of concrete sell for $9 per bag and cost $6 per bag (all variable costs, including the cost of cement). The subsidiary sells 100,000 bags per year and, at present, purchases its cement from an outside supplier at $9 per bag. Corbin Cement Company asks its subsidiary to buy 50,000 bags of cement at the $10 market price—an offer that is refused by Cohoes Concrete Products.

Required: **Compare gross profits under the present market-based transfer pricing system for Corbin Cement Products, its subsidiary, and the corporation as a whole with the gross profits if the transfer pricing system were based on standard costs for a production level of 150,000 bags of cement.**

SOLUTION

System	Corbin Cement Products	Cohoes Concrete Products	Corporation as a Whole
Market-based transfer pricing:			
Sales to outsiders	$ 1,000,000	$900,000	$1,900,000
Cost of goods sold	900,000	[1] 600,000	1,500,000
Gross profit	$ 100,000	$300,000	$ 400,000
Standard cost transfer pricing (using 150,000 bags of cement as basis for allocating fixed costs):			
Sales to outsiders	$ 1,000,000	$ 900,000	$ 1,900,000
Intracompany sales (costs)	383,333 [2]	(383,333)	--
Cost of goods sold	(1,150,000) [3]	(150,000) [4]	1,300,000
Gross profit	$ 233,333	$ 366,667	$ 600,000

[1]($5 x 100,000 bags) + $400,000 = $900,000
[2][$5 + ($400,000/150,000)] x 50,000 bags = $383,333
[3]($5 x 150,000 bags) + $400,000 = $1,150,000
[4][$6 - ($9*/2)] x 100,000 bags = $150,000

***The $9.00 is the cost per bag of cement purchased on the outside that would not be needed if the purchase were made within the company. Since one bag of cement is used to produce two bags of concrete, the per-unit cost of cement for one bag of concrete is equal to $4.50 (or half the cost of a bag of cement).**

With the standard cost system, the concrete subsidiary will profit, because $1.33 will be saved per bag of cement purchased [($9.00 - ($5 + $2.67)]. Corbin Cement Products will also profit because its fixed costs can be spread over a larger number of units. Most important, the corporation's overall gross profit will be increased by $200,000.

PROBLEM

4.
Listed below are relevant Company Z data for component Smurf that is produced by both Division X and outsiders and that is an integral part of product Widget that is produced by Division Y:

Y's annual purchase of Smurf	**50,000**
X's variable cost per unit of Smurf	**$10**
X's fixed cost per unit of Smurf	**$ 2**

Required: **Assume that both divisions are profit centers and have the right to buy and sell outside if their sister divisions don't meet the external market price.**

(1) **If Division X currently has some idle capacity, will Company Z, as a whole, be better off if Division Y buys Smurfs outside for $14 each rather than internally for the $15 per-unit selling price that allows Division X its normal markup?**
(2) **If Division X could sell all 50,000 units to outside buyers at $15 per unit, will Company Z be better off if Division Y buys Smurfs outside for $14 each rather than internally for the $15 per-unit selling price?**
(3) **If Division X has some idle capacity and the outside market price drops to $11 per unit, which is below the full cost of $12 per unit in Division X, will Company Z be better off if Division Y buys Smurfs externally?**

SOLUTION

(1) **No, the company will be worse off by $200,000 (the difference between the $14 per-unit outside price and the $10 per-unit variable cost, multiplied by 50,000 units).**
(2) **Yes, the company will be better off by the difference between the $250,000 contribution margin on the external sales [$50,000 x ($15 - $10)] and the $200,000 difference in part (1) above, or $50,000.**
(3) **No, the company will be worse off by $50,000, which is the difference between the outside price of $11 per unit and the $10 per-unit variable cost, multiplied by 50,000 units.**

PROBLEM

5.
Transfer Pricing. The Chemical Division of Bill Company produces lawn-care chemicals. One-third of Chemical's output is sold to the Lawn Services Division of Bill; the remainder is sold to outside customers. The Chemical Division's estimated sales and standard cost data for the year follow:

	Lawn Services	Outsiders
Sales	**$ 15,000**	**$40,000**
Variable cost	**(10,000)**	**(20,000)**
Fixed cost	**(3,000)**	**(6,000)**
Gross profit	**$ 2,000**	
$14,000		
Gallons sold	**5,000**	**10,000**

The Lawn Services Division has an opportunity to purchase 5,000 gallons of identical quality from an outside supplier at a cost of $1.75 per gallon on a continuing basis. Assume that the Chemical Division cannot sell any additional products to outside customers, that the fixed costs cannot be reduced, and that no alternative use of facilities is available.

Required: **Should Bill allow its Lawn Services Division to purchase the chemicals from the outside supplier? Support your answer by computing the increase or decrease in Bill Company operating costs.**

(AICPA adapted)

SOLUTION

Yes, because buying the chemicals would save Bill Company $1,250 determined as follows:

Variable cost to manufacture by Chemical Division	**$ 10,000**
Outside supplier cost ($1.75 x 5,000)	**8,750**
Savings to Bill if the Lawn Services Division purchases from the outside supplier	**$ 1,250**