

AC 202 MANAGEMENT ACCOUNTING

- ❖ Responsibility Accounting
 - ❖ Transfer Pricing
- ❖ Performance Measurement in Decentralized Organizations

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Learning Objectives

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- Garrison et. al (2015): Chapter 13
- After studying these topics, you should be able to:
 - understand the concept of responsibility accounting and identify types of responsibility centers
 - prepare a segmented income statement, and explain the difference between traceable fixed costs and common fixed costs
 - understand the fundamentals of transfer pricing and transfer pricing methods
 - compute return on investment (ROI) and show how changes in sales, expenses, and assets affect ROI
 - understand the concept of a balanced scorecard

Responsibility Accounting

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- Managers in large organizations have to delegate some decisions to those who are at lower levels in the organization.
- *Responsibility accounting* refers to an accounting system that collects, summarizes, and reports accounting data relating to the responsibilities of individual managers.
- A responsibility accounting system provides information to evaluate each manager on the items over which that manager has primary control.
- The term *responsibility center* is used for any part of an organization whose manager has control over, and is accountable for cost, revenue, profit, or investments.

Types of Responsibility Centers

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- There are 4 types of responsibility centers:
 - Cost (Expense) Center
 - Revenue Center
 - Profit Center
 - Investment Center



① Cost (Expense) Center

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- A segment whose manager has control over **costs**, but not over revenues or investment funds.
 - Manufacturing departments, warehousing, distribution
 - Research & Development, accounting, human resource, marketing activities
- Standard cost variances are often used to evaluate cost center performance.

② Revenue Center

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- A segment whose manager has control over **revenues**, but not over costs or investment funds. The main responsibility is to generate revenues.
 - e.g., Sales departments in commercial organizations; fundraising managers in not-for-profit organizations.
- However, most revenue center managers are also held accountable for **direct expenses** (e.g., salespeople's salaries and commission).
- But, still they are *not profit centers* because:
 - These costs are only a tiny fraction of the revenues generated;
 - Revenue centers are not charged for the costs of the goods they sell.

③ Profit Center

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- A segment whose manager has control over **both costs and revenues**, but no control over investment funds.
- Profit center managers are often evaluated by comparing actual profit to targeted or budgeted profit.

④ Investment Center

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- A segment whose manager has control over **costs, revenues, and investments** in operating assets.
- The main responsibility is to *generate returns (profits) on the investment*.
- In fact, managers have two performance objectives:
 - Generate maximum profits from the resources at their disposal;
 - Invest in additional resources only when such an investment will produce an adequate return.
- Absolute differences in profits are not meaningful if business units use different amounts of resources.

Controllability

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- *Controllability* is the degree of influence that a manager has over costs, revenues, or related items for which he is being held responsible.
- In summary, *responsibility accounting systems* is an accounting system that provides information relating to the responsibilities of individual managers to evaluate managers on controllable items.
- A responsibility accounting system could *exclude* all *uncontrollable costs* from a manager's performance report.

Segment Reporting of Profit Center: Example

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- | | |
|---|--|
| <ul style="list-style-type: none">□ Income Statement
(Contribution Margin
Format)
Revenue
<u>Less Variable costs</u>
Contribution margin
<u>Less Fixed costs</u>
<u>Operating income</u> | <ul style="list-style-type: none">□ Segmented Income
Statement (Contribution
Margin Format)
Revenue
<u>Less Variable costs</u>
Contribution margin
<u>Less Traceable fixed costs</u>
<u>Responsibility margin</u> |
|---|--|

Traceable Fixed Costs

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Traceable fixed costs arise because of the existence of a particular segment and would disappear over time if the segment itself disappeared.

No computer
division means . . .



No computer
division manager.



Common Fixed Costs

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Common fixed costs arise because of overall operation of the company and are not due to the existence of a particular center.

No computer
division means . . .



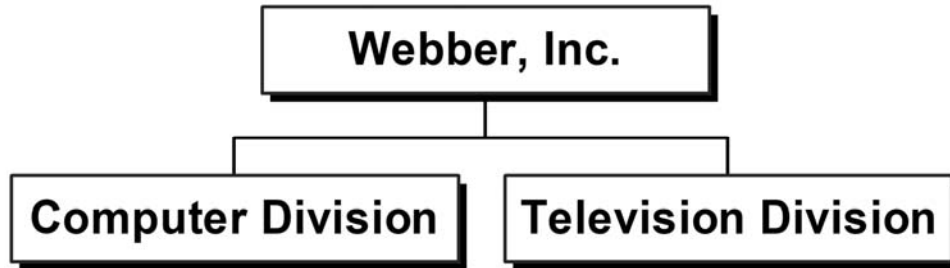
We still have a
company president.



Segment Reporting Example

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Webber, Inc. has two divisions (profit centers).



Let's look more closely at the Television Division's income statement.



Segment Reporting Example

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Income Statement Contribution Margin Format Television Division	
Sales	\$ 300,000
Total variable costs	\$ 150,000
Contribution margin	\$ 150,000
Traceable fixed costs	90,000
Responsibility margin	\$ 60,000

Responsibility margin (division margin) is the Television Division's contribution to overall operations.

Segment Reporting Example

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Let's see how the Television Division fits into Webber, Inc.

Income Statement			
	Company	Television	Computer
Sales	\$ 500,000	\$ 300,000	\$ 200,000
Variable costs	(230,000)	(150,000)	(80,000)
CM	\$ 270,000	\$ 150,000	\$ 120,000
Traceable FC	(170,000)	(90,000)	(80,000)
Responsibility margin	\$ 100,000	\$ 60,000	\$ 40,000
Common fixed costs	(25,000)		
Net income	\$ 75,000		

Traceable Costs Can Become Common Costs

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Fixed costs that are traceable on one level can become common if the business is divided into smaller parts.

Income Statement			
	Television Division	Color	HDTV
Sales	\$ 300,000	\$ 200,000	\$ 100,000
Variable costs	(150,000)	(95,000)	(55,000)
CM	\$ 150,000	\$ 105,000	\$ 45,000
Traceable FC	(80,000)	(45,000)	(35,000)
Responsibility margin	\$ 70,000	\$ 60,000	\$ 10,000
Common costs	10,000		
Net income	\$ 60,000	\$ 45,000	\$ 10,000

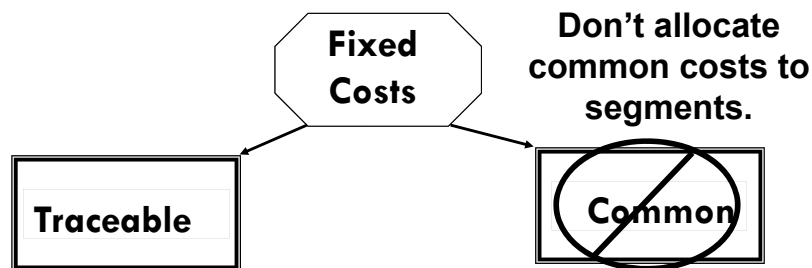
\$ 45,000	To Color
35,000	To HDTV
10,000	Common
<u>\$ 90,000</u>	TV Division

\$90,000 cost directly traced to the Television Division.

Evaluating Business Center Managers

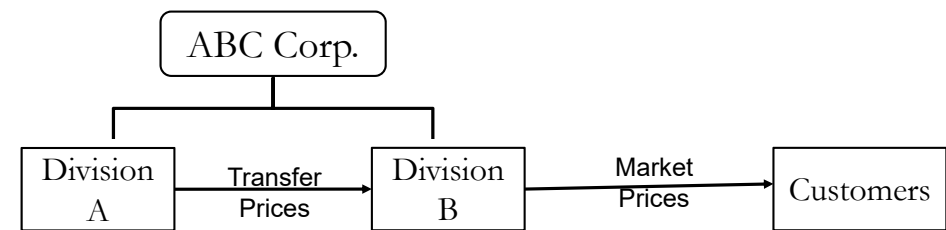
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- Managers should be evaluated on the portion of responsibility margin they control. The key issue is *controllability*.
- *Common fixed costs* which can not be traced to the Division should be *excluded* from the responsibility margin because:
 - they are not under the direct control of the center's managers.
 - they would not change even if a business center were eliminated.



TRANSFER PRICING DECISIONS

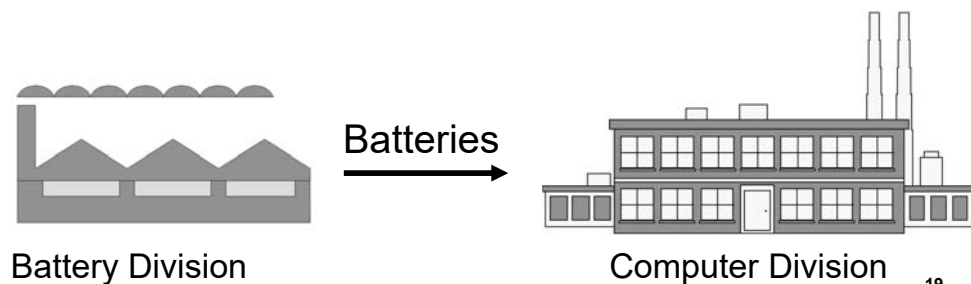
- *Transfer pricing decision* → how the companies price a product or service **within** the same organization.
- *Pricing decision* → how the companies price a product or service for **external** customers.



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TRANSFER PRICING DECISION

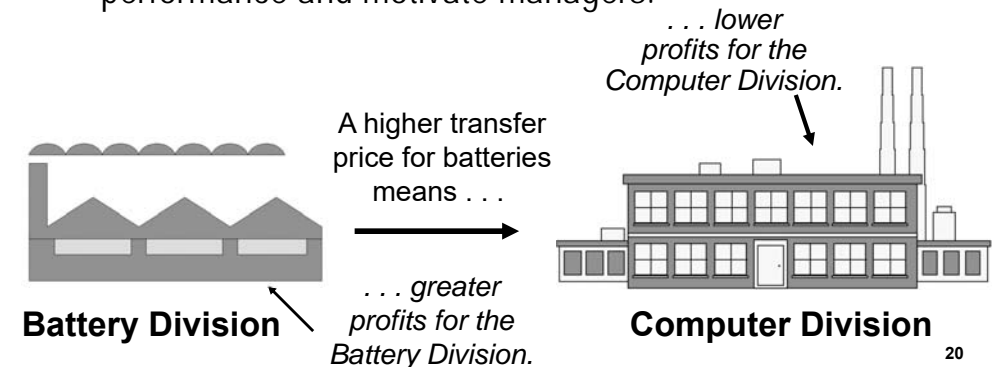
- ❖ *Transfer Price* – the price one subunit (department or division) charges for a product or service supplied to another subunit of the *same organization*.
- ❖ *Intermediate products* are the products transferred between subunits of an organization.



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TRANSFER PRICING DECISION

- The transfer price creates revenues for the selling subunit and purchase costs for the buying subunit, affecting each subunit's operating income.
- Creates operating incomes used to evaluate subunit performance and motivate managers.



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3 TRANSFER PRICING METHODS

1 Market-based transfer prices

- Use the price of a similar product or service publicly available in the market

2 Cost-based transfer prices

- Use the costs of producing the product in question.
- Examples include variable production costs, full costs, or cost plus markup

3 Negotiated transfer prices

- Use the price negotiated between subunits.

TRANSFER-PRICING METHODS EXAMPLE

- Lomas Co. has two divisions: Syrup and Candy.
- Syrup Division produces glucose syrup.
- Candy Division uses glucose syrup in its products.



Syrup Division

Candy Division

External Customers

VC per pound	\$15
FC per pound	<u>3</u>
Total	<u>\$18</u>

VC per pack	\$ 8
FC per pack	<u>4</u>
Total	<u>\$12</u>

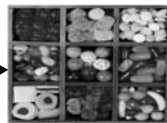
External market price per pack = \$60

Capacity 35,000 pounds per day

The division is buying 20,000 pounds per day

External market price for syrup per pound = \$23

Capacity 30,000 pounds per day



MARKET-BASED TRANSFER PRICES EXAMPLE

What is the market-based transfer price from Syrup Division to Candy Division?

Assume that the Candy Division buys 1,000 pounds of syrup from the Syrup Division. The Candy Division converts these 1,000 pounds of syrup into 500 packs of candy and sells them.

What are the Syrup Division's operating income and the Candy Division's operating income using the *market-based price*?

MARKET-BASED TRANSFER PRICES EXAMPLE

Syrup Division:

Revenues: ($\$23 \times 1,000$)	\$23,000
Deduct costs: ($\$18 \times 1,000$)	<u>18,000</u>
Operating income	<u>\$ 5,000</u>

Candy Division:

Revenues: ($\$60 \times 500$)	\$30,000
Deduct costs:	
Transferred-in ($\$23 \times 1,000$)	23,000
Division variable ($\$8 \times 500$)	4,000
Division fixed ($\$4 \times 500$)	<u>2,000</u>
Operating income	<u>\$ 1,000</u>

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MARKET-BASED TRANSFER PRICES EXAMPLE

What is the operating income of both divisions together?

Syrup Division	\$5,000
Candy Division	<u>1,000</u>
Total	<u>\$6,000</u>

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MARKET-BASED TRANSFER PRICES

- ✓ In perfectly competitive markets:
 - The *minimum price* the *selling division* is willing to accept from the buying division is the market price, because the selling division can always sell its output in the external market at that price.
 - The *maximum price* the *buying division* is willing to pay to the selling division is the market price, because the buying division can always buy its input in the external market at that price.
- ✓ A market-based transfer price gives freedom to subunit managers to make decisions to aligns their incentives with owners' incentives of maximizing overall corporate profits.

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COST-BASED TRANSFER PRICES EXAMPLE

Assume that the transfer price's policy of the company is at *112% of full costs*. What is the cost-based transfer price?

Variable costs per pound of syrup	\$15
Fixed costs per pound of syrup	<u>3</u>
Total full costs	<u>\$18</u>

Transfer price = $1.12 \times \$18 = \underline{\$20.16}$

What are the Syrup Division's operating income and the Candy Division's operating income using the *112% of full cost price*?

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COST-BASED TRANSFER PRICES EXAMPLE

Syrup Division:

Revenues: ($\$20.16 \times 1,000$)	\$20,160
Deduct costs: ($\$18.00 \times 1,000$)	<u>18,000</u>
Operating income	<u>\$ 2,160</u>

Candy Division:

Revenues ($\$60 \times 500$)	\$30,000
Deduct costs:	
Transferred-in ($\$20.16 \times 1,000$)	20,160
Division variable ($\$8.00 \times 500$)	4,000
Division fixed ($\$4.00 \times 500$)	<u>2,000</u>
Operating income	<u>\$ 3,840</u>

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COST-BASED TRANSFER PRICES EXAMPLE

What is the operating income of both divisions together?

	Market-based (\$23)	Cost-based (\$20.16)
Syrup Division	\$5,000	\$2,160
Candy Division	<u>1,000</u>	<u>3,840</u>
Total	<u>\$6,000</u>	<u>\$6,000</u>

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COST-BASED TRANSFER PRICES

- Cost-based transfer price is easy to implement
- However, cost-based transfer price is not useful for evaluating *profit center performance* if transfer price does not generate income.
- Cost-based transfer price is rule based. It does not preserve subunit autonomy.

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NEGOTIATED TRANSFER PRICES EXAMPLE

Assume the company uses negotiated transfer prices.
The range for price negotiation would be:

Between \$15 per pound (incremental costs)
and \$23.00 per pound (market price).

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NEGOTIATED TRANSFER PRICES

- Motivates management effort
- Preserves subunit autonomy
- However, bargaining takes time and may need to be reviewed and the price may depend on the negotiation skill, not the management skill

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GENERAL GUIDELINE FOR MINIMUM TRANSFER PRICE

Minimum transfer price
= Incremental costs per unit incurred
up to the point of transfer
+ Opportunity costs per unit* to the selling division

*= *contribution margin the selling division would receive from selling the products to external customers*

Revenues	\$23
- Variable costs	<u>15</u>
Contribution margin (opportunity cost)	<u>\$ 8</u>

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GENERAL GUIDELINE

Assume a perfectly competitive market, with no idle capacity. *Syrup Division* can sell all the syrup to the external market for \$23 per pound → **Opportunity cost = \$8**

The Syrup Division produces syrup with variable costs of \$15 per pound.

What is the minimum transfer price?

= Incremental cost + Opportunity cost

= \$15 + \$8 = \$23 = Market price

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GENERAL GUIDELINE

Assume that an intermediate market exists that is *not perfectly competitive*, and the selling division has idle capacity. The Syrup Division's opportunity cost of transferring the syrup internally is zero.

Additional margin if Syrup sells products to external customers
= \$0

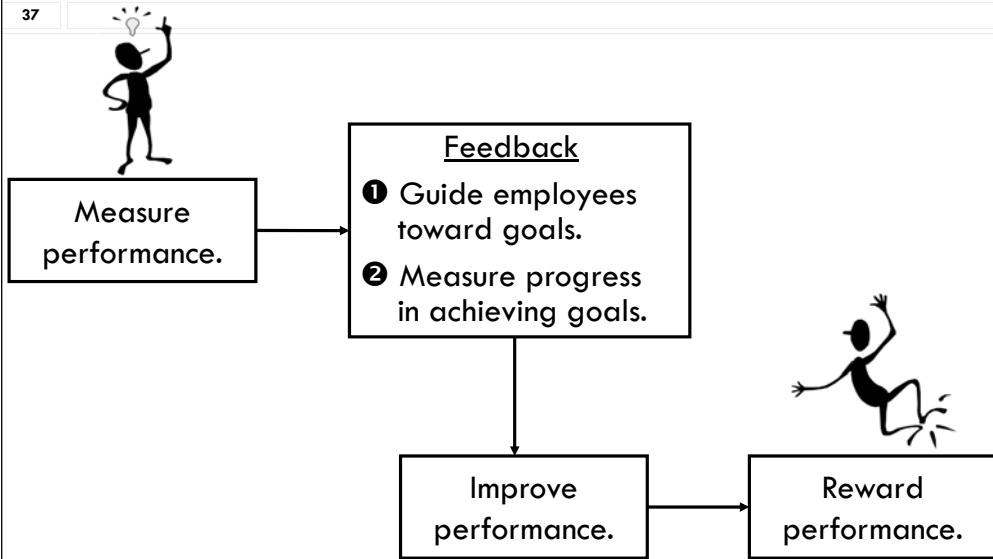
What is the minimum transfer price?

\$15 + \$0 = \$15

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Performance Measurement in Decentralized Organizations

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Return on Investment (ROI)

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- Return on investment is the ratio of profit to the investment used to generate the profit
- Also called the Accounting Rate of Return (ARR) or the Accrual Accounting Rate of Return (AARR)

$$\text{ROI} = \text{Income} \div \text{Investment}$$

- Definitions of income and investment depend on each company.

Return on Investment (ROI)

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- Alternative definitions of income:
 - Income before interest & tax
 - Income before tax
 - Net income
- Alternative definitions of investment:
 - Total assets available – includes all assets regardless of their particular purpose
 - Total assets employed – includes total assets available minus the sum of idle assets and assets purchased for future expansion
 - Total assets employed minus current liabilities – excludes that portion of total assets employed that are financed by short-term creditors

ROI



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Data of Redmond, a division of Wrap-up Corp.:

- Net operating income \$ 60,000
- Average operating assets \$300,000
- Revenues \$450,000
- Expenses \$390,000

The required rate of return for the company is 15%. What is the division's ROI?

Definition of income	= Net operating income
Definition of investment	= Average operating assets

$$\text{ROI} = \$60,000 / \$300,000 = 20\%$$

DuPont Method*

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The DuPont method of profitability analysis recognizes that there are two basic ingredients in profit making:

1. Increasing income per dollar of revenues
2. Using assets to generate more revenues

ROI = Return on sales × Investment turnover

Profit margin

$$\frac{\text{Income}}{\text{Investment}} = \frac{\text{Income}}{\text{Revenues}} \times \frac{\text{Revenues}}{\text{Investment}}$$

*The name comes from the DuPont Corporation that started using this formula in the 1920s.

DuPont Method

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Current ROI of Redmond:

$$\begin{aligned} \text{ROS} &= \text{Operating income} \div \text{Revenues} \\ &= \$60,000 \div \$450,000 \\ &= 13.33\% \end{aligned}$$

$$\begin{aligned} \text{ITO} &= \text{Revenues} \div \text{Investments} \\ &= \$450,000 \div \$300,000 \\ &= 1.50 \end{aligned}$$

$$\text{ROI} = 13.33\% \times 1.50 = 20\%$$

DuPont Method

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□ 3 ways to increase ROI:

- ① *Decrease nonperforming assets*, keeping revenues and operating income per dollar of revenue constant → *Investment turnover* increases.
- ② *Increase revenues*, keeping assets and operating income per dollar of revenues constant → *Investment turnover* increases.
- ③ *Decrease costs* to increase operating income per dollar of revenues, keeping revenues and assets constant → *Return on sales* increases.

$$\frac{\text{Income}}{\text{Investment}} = \frac{\text{Income}}{\text{Revenues}} \times \frac{\text{Revenues}}{\text{Investment}}$$

Return on Investment (ROI)

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- Most popular metric for two reasons:
 - Blends all the ingredients of profitability (revenues, costs, and investment) into a single percentage.
 - May be compared to other ROIs both inside and outside the firm.
- Criticisms of ROI:
 - A manager who is evaluated based on ROI may reject investment opportunities that are profitable for the whole company but that would have a negative impact on the manager's performance evaluation.

ROI



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A new project requires an investment of \$100,000 and would generate additional net operating income of \$18,000 per year. **New Project's ROI = _____%**

Would the company want the manager of the Redmond division to make this investment?

- a. Yes
- b. No

ROI



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Calculate average ROI if the division makes new investment.

If the manager of Redmond division is evaluated based on ROI, will she want to make this investment?

- a. Yes
- b. No

Balanced Scorecard

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- Firms are increasingly presenting financial and nonfinancial performance measures for their subunits in a Balanced Scorecard.
- The balanced scorecard (BSC) translates an organization's vision and strategy into a set of performance measures that provides the framework for implementing its strategy.
- It is called the *balanced scorecard* because it balances the use of financial and nonfinancial performance measures to evaluate performance.

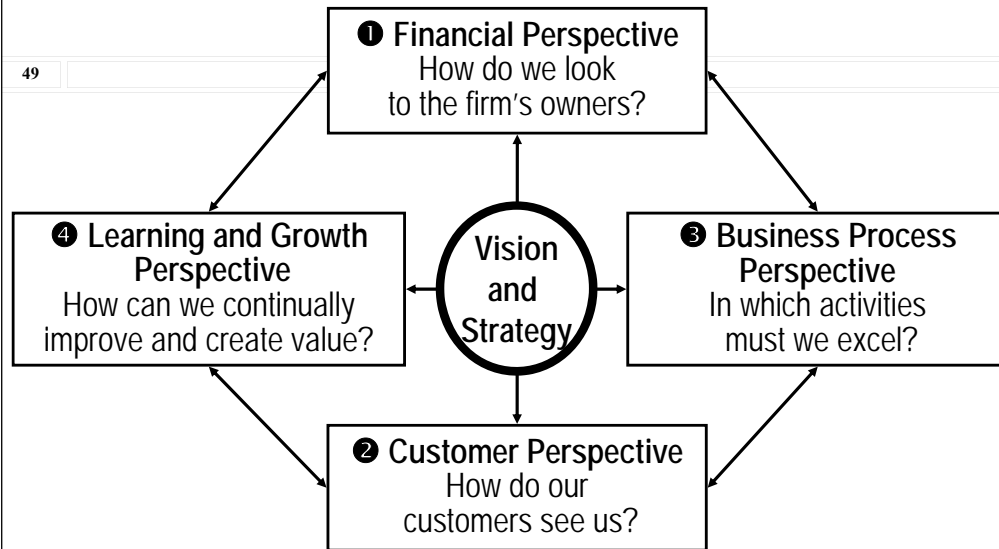
Balanced Scorecard

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- Management translates its strategy into four groups of performance measures that employees understand and influence:
 1. Financial
 2. Customer
 3. Internal Business Process
 4. Learning and Growth

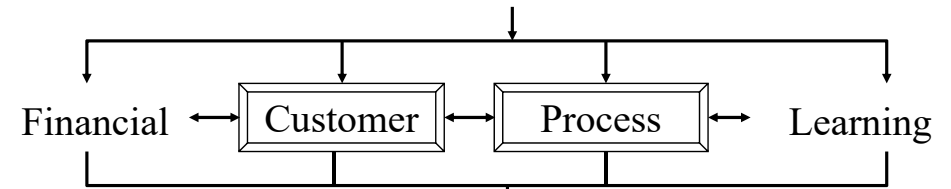
Balanced Scorecard

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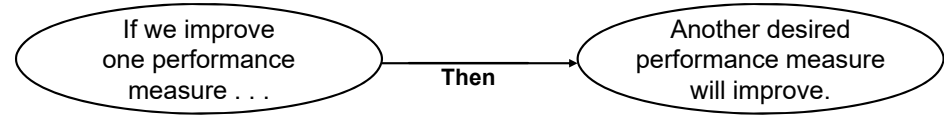
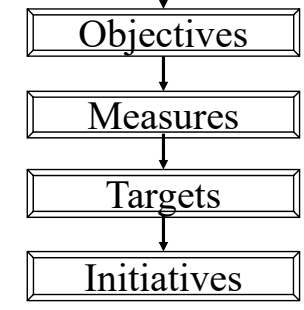


The premise of these four groups of measures is that learning is necessary to improve internal business processes. This in turn improves the level of customer satisfaction, thereby improving financial results. Note the emphasis on improvement, not just attaining some specific objective.

Vision and Strategy



A balanced scorecard should have measures that are linked together on a cause-and-effect basis.



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The Financial Perspective

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- ❖ How do we look to the firm's owners?
- ❖ Example of the *objective*:
 - Increase shareholder value
- ❖ Example of the financial perspective *measures*:
 - Revenue growth
 - Cost reduction in some areas
 - Return on investment
 - Stock prices
- ❖ Example of the initiatives:
 - Manage costs and unused capacity
 - Build strong customer relationships

The Customer Perspective

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- ❖ Identifies targeted customer and market segments and measures the company's success in these segments
- ❖ Example of the *objectives*:
 - Increase market share
 - Increase customer satisfaction
- ❖ Example of the customer perspective *measures*:
 - Market share
 - Customer satisfaction scores
 - Customer retention percentage
 - Time taken to fulfill customers requests
- ❖ Example of the *initiatives*:
 - Identify future needs of customer
 - Identify new target customer segments
 - Increase customer focus of sales organization

The Internal Business Perspective

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- Focuses on internal operations that create value for customers that, in turn, furthers the financial perspective by increasing shareholder value
- Example of the *objectives*:
 - Improve manufacturing quality and productivity
 - Meet specified delivery dates
- Example of the internal business perspective *measures*:
 - Number of new products or services, new product development time
 - Defect rates, yield (ratio of good output to total output)
 - Percentage of on-time delivery
 - Setup time, time taken to replace or repair defective products
- Example of the *initiatives*:
 - Identify problems and improve quality
 - Reengineer order delivery process

The Learning and Growth Perspective

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- Identifies the capabilities the organization must excel at to achieve superior internal processes that create value for customers and shareholders
- Example of the *objectives*:
 - Align employee and organization goals
 - Improve employees' skills
- ❖ Example of the learning and growth perspective *measures*:
 - Employee education and skill level
 - Employee satisfaction scores, employee turnover rates
 - Information system availability
- ❖ Example of the *initiatives*:
 - Employee participation and suggestion program to build teamwork
 - Training

The Balanced Scorecard – Example

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