Chapter
27

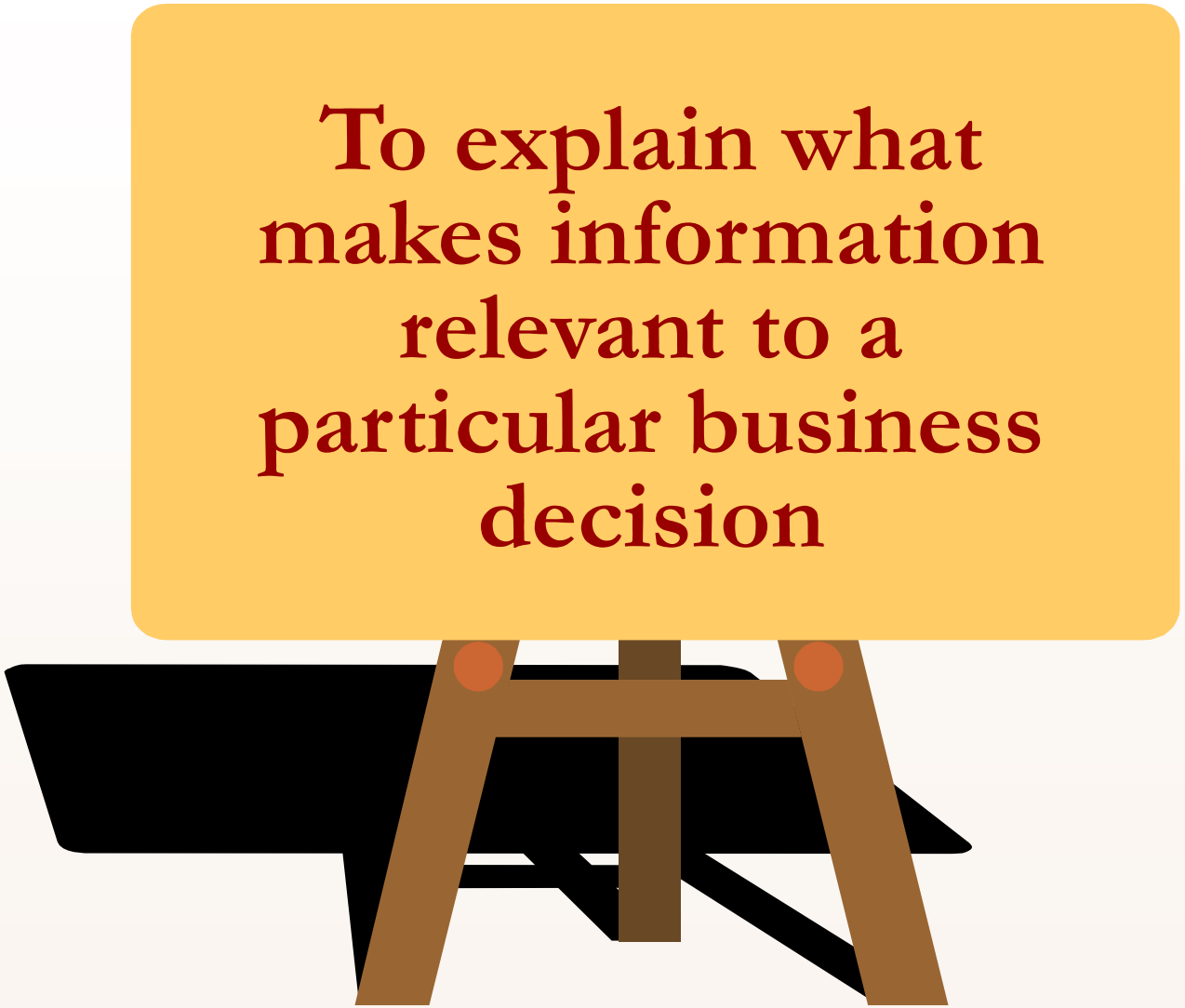
Managerial Accounting

Lecture 07: Incremental Analysis

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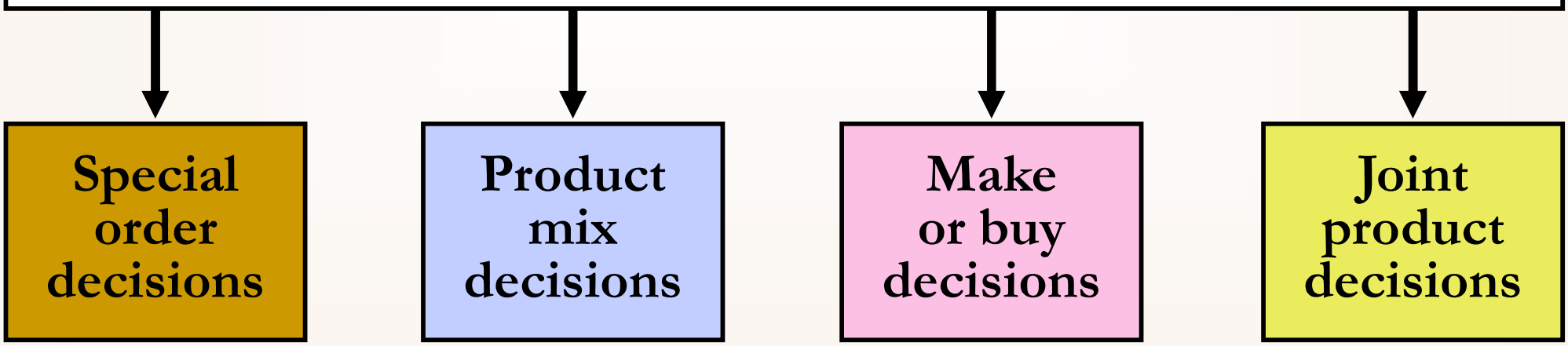
Learning Objective



LO1

The Challenge of Changing Markets

- Product markets can change quickly due to competitor price cuts, changing customer preferences, and introduction of new products by competitors.
- Managers must make short-run decisions, with a fixed set of resources, to react to the changing market place.



Incremental Analysis

- **Occurs when there is more than one alternative choice of action.**

Alternative One



Alternative Two



Learning Objective



LO2

Relevant Information in Business Decisions

Cost & revenue that varies among the possible alternative courses of action being considered

Decision Making

Decision making involves five steps:

1. Define the problem.
2. Identify the alternatives.
3. Collect information on alternatives.
4. Eliminate irrelevant information.
5. Make a decision with the remaining relevant information.

Relevant Cost

A **relevant cost** is a future cost that differs between alternatives.



Opportunity Cost

Opportunity cost is the potential benefit that is given up when one alternative is selected over another.



Opportunity Cost

Example: If you do not join M.Sc. program, you could be earning TK120,000 per year.

Your opportunity cost of joining M.Sc. program for one year includes the TK120,000.

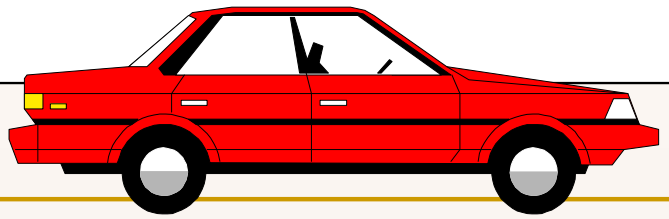
Opportunity costs are not recorded in the accounting records, but are relevant to decisions because they are a real sacrifice.

Sunk Cost

A **sunk cost** is a cost that has already been incurred and that cannot be changed by any decision made now or in future.

Sunk costs should not be considered in decisions.

Example: You bought an automobile that cost Tk 600,000 two years ago. The Tk 600,000 cost is sunk because whether you drive it, park it, trade it, or sell it, you cannot change the Tk 600,000 cost.

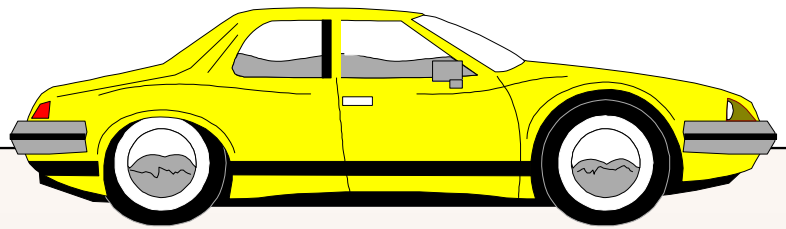


Out-of-Pocket Costs

An **out-of-pocket cost** is a cost requiring cash disbursements in the current accounting period.

Out-of-Pocket costs should be considered in decisions.

Example: You wish to buy an new automobile that cost Tk 1,000,000 today. The Tk 1,000,000 cost is Out-of-Pocket cost because it requires a actual cash outlay in the current accounting period to materialize the acquisition.



Learning Objective

To use incremental analysis in common business decisions.



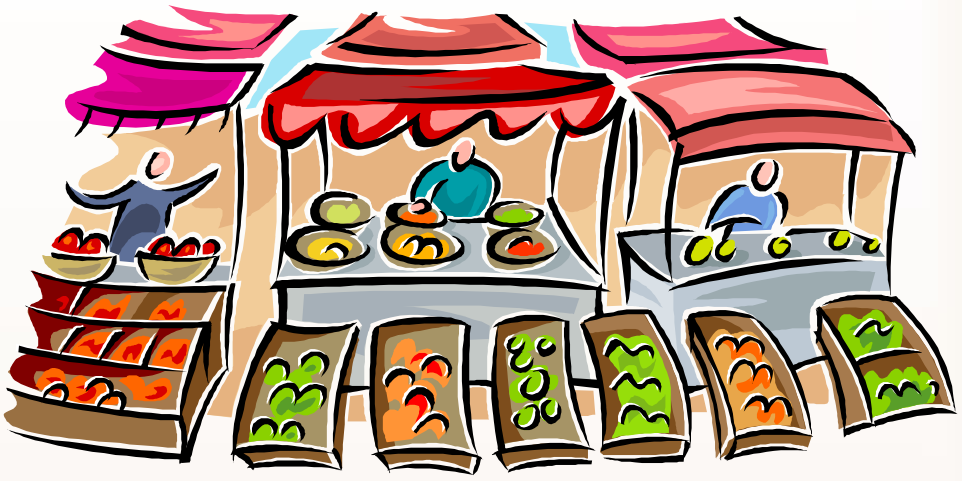
LO3

Types of Incremental Analysis

- Accept an order at a special price
- Make or buy components or finished products
- Sell products or process further
- Retain or replace equipment
- Eliminate an unprofitable business segment
- Allocate limited resources

Special Order Decisions

The decision to accept additional business should be based on incremental costs and incremental revenues.



Incremental amounts are those that occur only if the company decides to accept the new business.

Special Order Decisions

View Co. currently sells 100,000 units of its product. The company has revenue and costs as shown below:

	Per Unit	Total
Sales	$ 10.00	$ 1,000,000
Direct materials	3.50	350,000
Direct labor	2.20	220,000
Factory overhead	1.10	110,000
Selling expenses	1.40	140,000
Administrative expenses	0.80	80,000
Total expenses	$ 9.00	$ 900,000
Operating income	$ 1.00	$ 100,000

Special Order Decisions

View Co. is approached by an overseas company that offers to purchase 10,000 units at $8.50 per unit.

If View Co. accepts the offer, total factory overhead will increase by $5,000; total selling expenses will increase by $2,000; and total administrative expenses will increase by $1,000.

Should View Co. accept the offer?

Special Order Decisions

First let's look at incorrect reasoning that leads to an incorrect decision.

Our cost is $9.00 per unit. I can't sell for $8.50 per unit.



Special Order Decisions

	Current Business	Additional Business	Combined
Sales	$ 1,000,000	$ 85,000	$ 1,085,000
Direct materials	$ 350,000	$ 35,000	$ 385,000
Direct labor	220,000	22,000	242,000
Factory overhead	110,000	5,000	115,000
Selling expenses	140,000	2,000	142,000
Admin. expenses	80,000	1,000	81,000
Total expenses	$ 900,000	$ 65,000	$ 965,000
Operating income	$ 100,000	$ 20,000	$ 120,000

This analysis leads to the correct decision.

Special Order Decisions

	Current Business	Additional Business	Combined
Sales	$ 1,000,000	$ 85,000	$ 1,085,000
Direct materials	$ 350,000	$ 35,000	$ 385,000
Direct labor	220,000	22,000	242,000
Factory overhead	110,000	5,000	115,000
Selling expenses	140,000	2,000	142,000
Admin. expenses	80,000	1,000	81,000
Total expenses	$ 900,000	$ 65,000	$ 965,000
Operating income	$ 100,000	$ 20,000	$ 120,000

10,000 new units × $8.50 selling price = $85,000

Special Order Decisions

	Current Business	Additional Business	Combined
Sales	$ 1,000,000	$ 85,000	$ 1,085,000
Direct materials	$ 350,000	$ 35,000	$ 385,000
Direct labor	220,000	22,000	242,000
Factory overhead	110,000	5,000	115,000
Selling expenses	140,000	2,000	142,000
Admin. expenses	80,000	1,000	81,000
Total expenses	$ 900,000	$ 65,000	$ 965,000
Operating income	$ 100,000	$ 20,000	$ 120,000

10,000 new units × $3.50 = $35,000

Special Order Decisions

	Current Business	Additional Business	Combined
Sales	$ 1,000,000	$ 85,000	$ 1,085,000
Direct materials	$ 350,000	$ 35,000	$ 385,000
Direct labor	220,000	22,000	242,000
Factory overhead	110,000	5,000	115,000
Selling expenses	140,000	2,000	142,000
Admin. expenses	80,000	1,000	81,000
Total expenses	$ 900,000	$ 65,000	$ 965,000
Operating income	$ 100,000	$ 20,000	$ 120,000

10,000 new units × $2.20 = $22,000

Special Order Decisions

	Current Business	Additional Business	Combined
Sales	$ 1,000,000	$ 85,000	$ 1,085,000
Direct materials			000
Direct labor			000
Factory overhead			000
Selling expenses	140,000	2,000	142,000
Admin. expenses	80,000	1,000	81,000
Total expenses	$ 900,000	$ 65,000	$ 965,000
Operating income	$ 100,000	$ 20,000	$ 120,000

Even though the $8.50 selling price is less than the normal $10 selling price, View Co. should accept the offer because net income will increase by $20,000.

Make or Buy Decisions

Should I continue to make the part, or should I buy it?

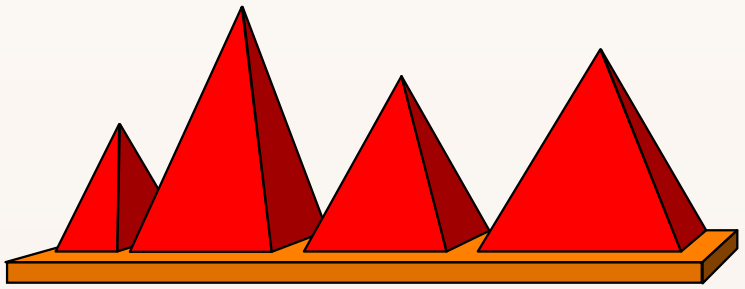
I suppose I should compare the outside purchase price with the additional costs to manufacture the part.

What will I do with my idle facilities if I buy the part?



Make or Buy Decisions

- **Incremental costs also are important in the decision to make a product or buy it from a supplier.**
- **The cost to produce an item must include (1) direct materials, (2) direct labor and (3) incremental overhead.**



Make or Buy Decisions

Excel makes computer chips used in one of its products. Unit costs, based on production of 20,000 chips per year, are:

	Unit Costs
Direct Material	$ 9.00
Direct Labor	5.00
Variable Overhead	1.00
Fixed Overhead	13.00
Total	$ 28.00

Make or Buy Decisions

An outside supplier has offered to provide the 20,000 chips at a cost of $25 per chip. Fixed overhead costs will not be avoided if the chips are purchased. Excel has no alternative use for the facilities.

Should Excel accept the offer?

Make or Buy Decisions

Differential costs of making (costs avoided if bought from outside supplier)

	Unit Cost
Direct Material	$ 9.00
Direct Labor	5.00
Variable Overhead	1.00
Total	$ 15.00

Excel should not pay $25 per unit to an outside supplier to avoid the $15 per unit differential cost of making the part. Fixed costs are irrelevant to decision.

Make or Buy Decisions

If Excel buys the chips from the outside supplier, the idle facilities could be leased to another company for $250,000 per year.

Should Excel buy the chips and lease the facilities?



New Information

Make or Buy Decisions

Differential costs of making (considering opportunity cost of facilities)

	Unit Cost
Direct Material	$ 9.00
Direct Labor	5.00
Variable Overhead	1.00
Opportunity cost (250000/20000)	12.50
Total	$ 27.50

The opportunity cost of facilities changes the decision.

Sell, Scrap, or Rebuild Decisions

Costs incurred in manufacturing units of product that do not meet quality standards are sunk costs and cannot be recovered.

As long as rebuild costs are recovered through sale of the product, and rebuilding does not interfere with normal production, we should rebuild.

Sell, Scrap, or Rebuild Decisions

Servo has 10,000 defective units that cost $1.00 each to make. The units can be scrapped now for $.40 each or rebuilt at an additional cost of $.80 per unit.

If rebuilt, the units can be sold for the normal selling price of $1.50 each. Rebuilding the 10,000 defective units will prevent the production of 10,000 new units that would also sell for $1.50.

Should Servo scrap or rebuild?

Sell, Scrap, or Rebuild Decisions

	Scrap Now	Rebuild
Sale of defects	$ 4,000	$ 15,000
Less rebuild costs	-	
Less opportunity cost	-	
Net return	$ 4,000	

10,000 units × $0.40 per unit

10,000 units × $1.50 per unit

Sell, Scrap, or Rebuild Decisions

10,000 units × $0.80 per unit

	Scrap Now	Rebuild
Sale of defects	$ 4,000	$ 15,000
Less rebuild costs	-	(8,000)
Less opportunity cost	-	(5,000)
Net return	$ 4,000	2,000

10,000 units × ($1.50 - $1.00) per unit

Sell, Scrap, or Rebuild Decisions

Servo should scrap the units now.

	Scrap Now	Rebuild
Sale of defects	$ 4,000	$ 15,000
Less rebuild costs	-	(8,000)
Less opportunity cost	-	(5,000)
Net return	$ 4,000	2,000

If Servo fails to include the opportunity cost, the rework option would show a return of $7,000, mistakenly making rebuild appear more favorable.

Production Constraint Decisions

Managers often face the problem of deciding how scarce resources are going to be utilized.

Usually, fixed costs are not affected by this particular decision, so management can focus on maximizing total contribution margin.

Let's look at the ABC Company example.

Production Constraint Decisions

ABC Company produces two products and selected data is shown below:

	Products	
	1	2
Selling price per unit	$ 60	$ 50
Less: variable expenses per unit	36	35
Contribution margin per unit	$ 24	$ 15
Current demand per week (units)	2,000	2,200
Contribution margin ratio	40%	30%
Processing time required on machine A1 per unit	1.00 min.	0.50 min.



Production Constraint Decisions

Machine A1 is the scarce resource because there is excess capacity on other machines. Machine A1 is being used at 100% of its capacity.

Machine A1 capacity is 2,400 minutes per week.

Should ABC focus its efforts on Product 1 or 2?



Production Constraint Decisions

Let's calculate the contribution margin per unit of the scarce resource, machine A1.

	Products			
	1		2	
Contribution margin per unit	$ 24		$ 15	
Time required to produce one unit	÷ 1.00	min.	÷ ?	min.
Contribution margin per minute	$ 24		?	

Production Constraint Decisions

Let's calculate the contribution margin per unit of the scarce resource, machine A1.

	Products			
	1		2	
Contribution margin per unit	$ 24		$ 15	
Time required to produce one unit	÷ 1.00	min.	÷ 0.50	min.
Contribution margin per minute	$ 24		$ 30	

Product 2 should be emphasized. It is the more valuable use of the scarce resource, machine A1, yielding a contribution margin of $30 per minute as opposed to $24 for Product 1.

Production Constraint Decisions

Let's calculate the contribution margin per unit of the scarce resource, machine A1.

	Products			
	1		2	
Contribution margin per unit	$ 24		$ 15	
Time required to produce one unit	÷ 1.00	min.	÷ 0.50	min.
Contribution margin per minute	$ 24		$ 30	

If there are no other considerations, the best plan would be to produce to meet current demand for Product 2 and then use any capacity that remains to make Product 1.

Production Constraint Decisions

Let's see how this plan would work.

Allotting Our Scarce Resource (Machine A1)

Weekly demand for Product 2		2,200	units
Time required per unit	×	0.50	min.
Total time required to make Product 2		1,100	min.

Production Constraint Decisions

Let's see how this plan would work.

Allotting Our Scarce Resource (Machine A1)

Weekly demand for Product 2		2,200	units
Time required per unit	×	0.50	min.
Total time required to make Product 2		1,100	min.
Total time available		2,400	min.
Time used to make Product 2		1,100	min.
		1,300	

Production Constraint Decisions

Let's see how this plan would work.

Allotting Our Scarce Resource (Machine A1)

Weekly demand for Product 2		2,200	units
Time required per unit	×	0.50	min.
Total time required to make Product 2		1,100	min.
Total time available		2,400	min.
Time used to make Product 2		1,100	min.
Time available for Product 1		1,300	min.
Time required per unit	÷	1.00	min.
Production of Product 1		1,300	units

Production Constraint Decisions

According to the plan, we will produce 2,200 units of Product 2 and 1,300 of Product 1. Our contribution margin looks like this.

	Product 1	Product 2
Production and sales (units)	1,300	2,200
Contribution margin per unit	$ 24	$ 15.00
Total contribution margin	$ 31,200	$ 33,000

The total contribution margin for ABC is $64,200.

End of Lecture 07

THANK YOU ALL...