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5TH EDITION

Managerial Accounting

TOOLS FOR BUSINESS DECISION MAKING

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chapter 7

Incremental Analysis

Managerial Accounting
Fifth Edition
Weygandt • Kimmel • Kieso

study objectives

1. Identify the steps in management's decision-making process.
2. Describe the concept of incremental analysis.
3. Identify the relevant costs in accepting an order at a special price.
4. Identify the relevant costs in a make-or-buy decision.
5. Identify the relevant costs in determining whether to sell or process materials further.
6. Identify the relevant costs to be considered in retaining or replacing equipment.
7. Identify the relevant costs in deciding whether to eliminate an unprofitable segment.

preview of chapter 7

Incremental Analysis

Management's Decision-Making Process

- Incremental analysis approach
- How incremental analysis works

Types of Incremental Analysis

- Accept an order at a special price
- Make or buy
- Sell or process further
- Retain or replace equipment
- Eliminate an unprofitable segment

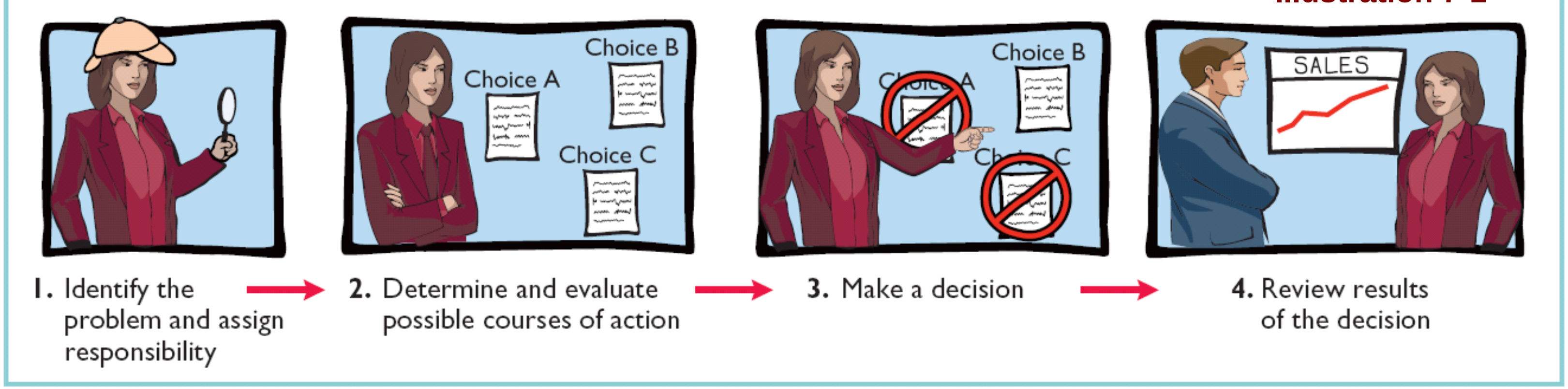
Other Considerations

- Qualitative factors
- Incremental analysis and ABC

Management's Decision-Making Process

- Important management function.
- Does not always follow a set pattern.
- Decisions vary in scope, urgency, and importance.
- Steps usually involved in process include:

Illustration 7-1



SO 1 Identify the steps in management's decision-making process.

Management's Decision-Making Process

- Considers both financial and non-financial information.
- **Financial information** includes revenues and costs as well as their effect on overall profitability.
- **Non-financial information** includes effect on employee turnover, the environment, or overall company image.

SO 1 Identify the steps in management's decision-making process.

Management's Decision-Making Process

Incremental Analysis Approach

- Decisions involve a choice among alternative actions.
- Process used to identify the financial data that change under alternative courses of action.
  - Both costs and revenues may vary or
  - Only revenues may vary or
  - Only costs may vary

How Incremental Analysis Works

Illustration 7-2

Incremental Analysis.xls

File Edit View Insert Format Tools Data Window Help

	A	B	C	D
1		Alternative A	Alternative B	Net Income Increase (Decrease)
2	Revenues	$125,000	$110,000	$ (15,000)
3	Costs	100,000	80,000	20,000
4	Net income	$ 25,000	$ 30,000	$ 5,000
5				

Comparison of Alternative B with Alternative A:

- Incremental revenue is $15,000 **less** under Alternative B.
- Incremental **cost savings** of $20,000 is realized.
- Alternative B produces **$5,000 more net income**.

How Incremental Analysis Works

Important concepts used in **incremental analysis**:

- Relevant cost.
- Opportunity cost.
- Sunk cost.

Management's Decision-Making Process

How Incremental Analysis Works

- Sometimes involves changes that seem contrary to intuition.
- Variable costs sometimes do not change under alternatives.
- Fixed costs sometimes change between alternatives.
- Incremental analysis not the same as CVP analysis.

Review Question

Incremental analysis is the process of identifying the financial data that

a. Do not change under alternative courses of action.

b. Change under alternative courses of action.

c. Are mixed under alternative courses of action.

d. None of the above.

Solution on notes page

Service Company Insight

That Letter from AmEx Might Not Be a Bill

No doubt every one of you has received an invitation from a credit card company to open a new account—some of you have probably received three in one day. But how many of you have received an offer of $300 to close out your credit card account? American Express decided to offer some of its customers $300 if they would give back their credit card. You could receive the $300 even if you hadn't paid off your balance yet, as long as you agreed to give up your credit card.

Source: Aparajita Saha-Bubna and Lauren Pollock, "AmEx Offers Some Holder $300 to Pay and Leave," *Wall Street Journal Online*, February 23, 2009.

? What are the relevant costs that American Express would need to know in order to determine to whom to make this offer?

Types of Incremental Analysis

1. Accept an order at a special price.
2. Make or buy.
3. Sell or process further.
4. Retain or replace equipment.
5. Eliminate an unprofitable business segment.
6. Allocate limited resources.

Types of Incremental Analysis

Accept an Order at a Special Price

- Obtain additional business by making a major price concession to a specific customer.
- Assumes that sales of products in other markets are not affected by special order.
- Assumes that company is not operating at full capacity.

Types of Incremental Analysis

Accept an Order at a Special Price

Illustration: Sunbelt Company produces 100,000 automatic blenders per month, which is 80 percent of plant capacity. Variable manufacturing costs are $8 per unit. Fixed manufacturing costs are $400,000, or $4 per unit. The blenders are normally sold directly to retailers at $20 each. Sunbelt has an offer from Mexico Co. (a foreign wholesaler) to purchase an additional 2,000 blenders at $11 per unit. Acceptance of the offer would not affect normal sales of the product, and the additional units can be manufactured without increasing plant capacity. **What should management do?**

SO 3 Identify the relevant costs in accepting an order at a special price.

Types of Incremental Analysis

Accept an Order at a Special Price

Illustration 7-4

	Reject Order	Accept Order	Net Income Increase (Decrease)
Revenues			
Costs			
Net income			

- **Fixed costs** do not change since within existing capacity – thus fixed costs are **not relevant**.
- **Variable manufacturing costs** and expected revenues change – thus both **are relevant** to the decision.

Solution on notes page

Types of Incremental Analysis

Make or Buy

Illustration: Baron Company incurs the following annual costs in producing 25,000 ignition switches for motor scooters.

Illustration 7-5

Direct materials	$ 50,000
Direct labor	75,000
Variable manufacturing overhead	40,000
Fixed manufacturing overhead	60,000
Total manufacturing costs	$225,000
Total cost per unit ($225,000 ÷ 25,000)	**$9.00**

Instead of making its own switches, Baron Company might purchase the ignition switches at a price of $8 per unit. **"What should management do?"**

Types of Incremental Analysis

Make or Buy

Illustration 7-6

	Make	Buy	Net Income Increase (Decrease)
Direct materials	$ 50,000		
Direct labor	75,000		
Variable manufacturing costs	40,000		
Fixed manufacturing costs	60,000		
Purchase price (25,000 × $8)	0		
Total annual cost	$225,000		

- Total manufacturing cost is $1 higher than purchase price.
- Must absorb at least $50,000 of fixed costs under either option.

Solution on notes page

Types of Incremental Analysis

Make or Buy – Opportunity Cost

The **potential benefit** that may be obtained from following an alternative course of action.

Types of Incremental Analysis

Make or Buy – Opportunity Cost

Illustration: Assume that through buying the switches, Baron Company can use the released productive capacity to generate additional income of $28,000 from producing a different product. This lost income is an additional cost of continuing to make the switches in the make-or-buy decision.

Illustration 7-7

	Make	Buy	Net Income Increase (Decrease)
Total annual cost	$225,000	$250,000	$(25,000)
Opportunity cost			
Total cost			

Solution on notes page

SO 4 Identify the relevant costs in a make-or-buy decision.

Review Question

In a make-or-buy decision, relevant costs are:

a. Manufacturing costs that will be saved.

b. The purchase price of the units.

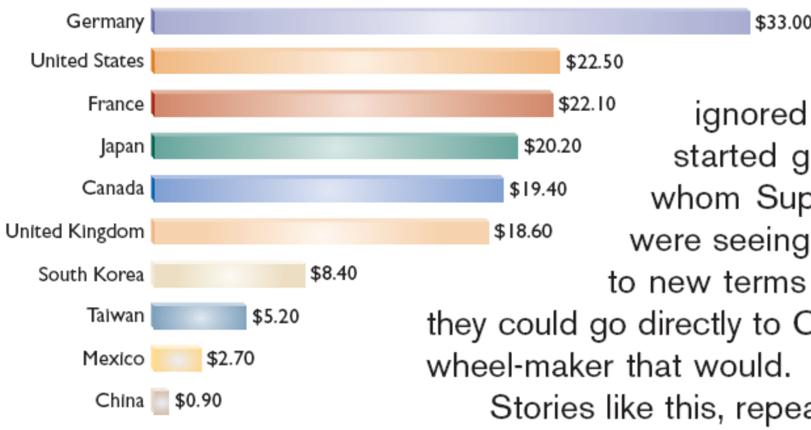
c. Opportunity costs.

d. All of the above.

Solution on notes page

International Insight

These Wheels Have Miles Before Installation



Consider the make-or-buy decision faced by Superior Industries International, Inc., a big aluminum-wheel maker in Van Nuys, California. For years, president Steve Borick had ignored the possibility of Chinese manufacturing. Then Mr. Borick started getting a blunt message from General Motors and Ford, with whom Superior does 85% of its business: Match the prices that they were seeing at Chinese wheel suppliers. If Superior did not want to agree to new terms at those lower prices, both auto makers said separately that they could go directly to Chinese manufacturers or could turn to another North American wheel-maker that would.

Stories like this, repeated in various industries, illustrate why manufacturers engage in overseas outsourcing. (Some refer to this as *off-shoring*.) For example, compare the relative labor costs in major auto-producing nations, in dollars per hour, to see why incremental analysis often leads to outsourcing production to countries like China.

Source: Norihiko Shirouzu, "Big Three's Outsourcing Plan: Make Parts Suppliers *Do it*," *Wall Street Journal*, June 10, 2004, p. A1.

? What are the disadvantages of outsourcing to a foreign country?

Types of Incremental Analysis

Sell or Process Further

- May have option to sell product at a given point in production or to process further and sell at a higher price.

- **Decision Rule:**

  Process further as long as the incremental revenue from such processing exceeds the incremental processing costs.

Types of Incremental Analysis

Sell or Process Further - Single-Product Case

Illustration: Woodmasters Inc. makes tables. The cost to manufacture an unfinished table is $35. The selling price per unfinished unit is $50. Management concludes that some of the unused capacity may be used to finish the tables and sell them at $60 per unit. For a finished table, direct materials will increase $2 and direct labor costs will increase $4. Variable manufacturing overhead costs will increase by $2.40 (60% of direct labor). No increase is anticipated in fixed manufacturing overhead.

Illustration 7-8

Direct materials	$15
Direct labor	10
Variable manufacturing overhead	6
Fixed manufacturing overhead	4
Manufacturing cost per unit	**$35**

Types of Incremental Analysis

Sell or Process Further - Single-Product Case

The incremental analysis on a per unit basis is as follows.

Illustration 7-9

	Sell	Process Further	Net Income Increase (Decrease)
Sales per unit	$50.00		
Cost per unit			
Direct materials	15.00		
Direct labor	10.00		
Variable manufacturing overhead	6.00		
Fixed manufacturing overhead	4.00		
Total	35.00		
Net income per unit	$15.00		

Should Woodmasters sell or process further?

Solution on notes page

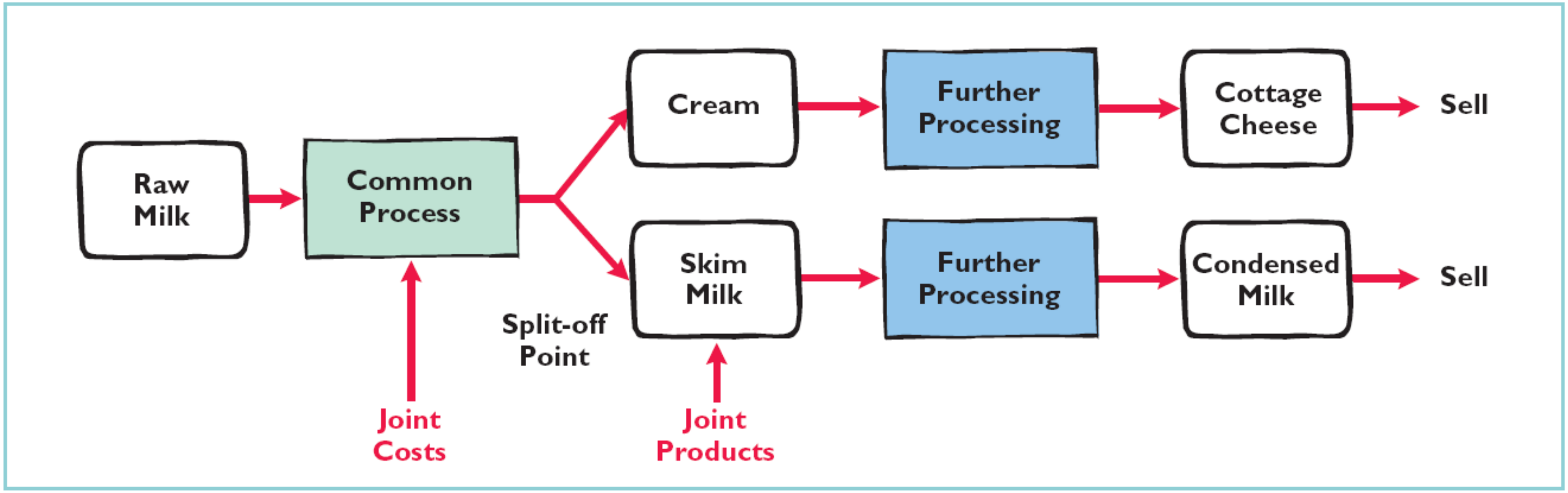
SO 5 Identify the relevant costs in determining whether to sell or process materials further.

Types of Incremental Analysis

Sell or Process Further - Multiple-Product Case

Joint product situation for Marais Creamery. Cream and skim milk are products that result from the processing of raw milk.

Illustration 7-10



Joint product costs are **sunk costs** and thus not relevant to the sell-or-process further decision.

Types of Incremental Analysis

Sell or Process Further - Multiple-Product Case

Cost and revenue data per day.

Illustration 7-11

Costs (per day)	
Joint cost allocated to cream	$ 9,000
Joint cost allocated to skim milk	5,000
Processing cream into cottage cheese	10,000
Processing skim milk into condensed milk	8,000
Expected Revenues from Products (per day)	
Cream	$19,000
Skim milk	11,000
Cottage cheese	27,000
Condensed milk	26,000

Determine whether the company should simply sell the cream and skim milk, or process them further into cottage cheese and condensed milk.

Types of Incremental Analysis

Sell or Process Further - Multiple-Product Case

Analysis of whether to sell cream or process into cottage cheese.

Illustration 7-12

	Sell	Process Further	Net Income Increase (Decrease)
Sales per day	$19,000		
Cost per day			
Processing cream into cottage cheese	0		
	$19,000		

Marais should or should not process the cream further?

Solution on notes page

SO 5 Identify the relevant costs in determining whether to sell or process materials further.

Types of Incremental Analysis

Sell or Process Further - Multiple-Product Case

Analysis of whether to sell skim milk or process into condensed milk.

Illustration 7-13

	Sell	Process Further	Net Income Increase (Decrease)
Sales per day	$11,000		
Cost per day			
Processing skim milk into condensed milk	0		
	$11,000		

Note the joint costs are irrelevant in deciding whether to sell or process further.

Solution on notes page

SO 5 Identify the relevant costs in determining whether to sell or process materials further.

Types of Incremental Analysis

Review Question

The decision rule is a sell-or-process-further decision:

Process further as long as the incremental revenue from processing exceeds:

a. Incremental processing costs.

b. Variable processing costs.

c. Fixed processing costs.

d. No correct answer is given.

Solution on notes page

Types of Incremental Analysis

Retain or Replace Equipment

Illustration: Jeffcoat Company is considering replacing a factory machine with a new machine.

Assessment of replacement of factory machine:

	Old Machine	New Machine
Book Value	$ 40,000	
Cost		$ 120,000
Remaining useful life	four years	four years
Salvage value	-0-	-0-

Variable manufacturing costs decrease from $160,000 to $125,000 if new machine purchased.

SO 6 Identify the relevant costs to be considered in retaining or replacing equipment.

Types of Incremental Analysis

Retain or Replace Equipment

Prepare the incremental analysis for the four-year period.

Illustration 7-14

	Retain Equipment		Replace Equipment		Net Income Increase (Decrease)
Variable manufacturing costs	$640,000	a	$500,000	b	**$140,000**
New machine cost					
Total					
a(4 years × $160,000)					
b(4 years × $125,000)					

Retain or Replace?

Solution on notes page

SO 6 Identify the relevant costs to be considered in retaining or replacing equipment.

Types of Incremental Analysis

Retain or Replace Equipment

Additional Considerations

- The book value of old machine does not affect the decision.
  - Book value is a sunk cost.
  - Costs which cannot be changed by future decisions (sunk cost) are not relevant in incremental analysis.
- However, any trade-in allowance or cash disposal value of the existing asset is relevant.

Types of Incremental Analysis

Eliminate an Unprofitable Segment

- **Key:** Focus on Relevant Costs.
- Consider effect on related product lines.
- Fixed costs allocated to the unprofitable segment **must be absorbed** by the other segments.
- Net income may **decrease** when an unprofitable segment is eliminated.
- **Decision Rule**: Retain the segment unless fixed costs eliminated exceed contribution margin lost.

SO 7 Identify the relevant costs in deciding whether to eliminate an unprofitable segment.

Types of Incremental Analysis

Eliminate an Unprofitable Segment

Illustration: Martina Company manufactures three models of tennis rackets:

- Profitable lines: Pro and Master
- Unprofitable line: Champ

Should Champ be eliminated?

Illustration 7-15

Segment income data

	Pro	Master	Champ	Total
Sales	$800,000	$300,000	**$100,000**	$1,200,000
Variable expenses	520,000	210,000	**90,000**	820,000
Contribution margin	280,000	90,000	**10,000**	380,000
Fixed expenses	80,000	50,000	**30,000**	160,000
Net income	$200,000	$ 40,000	**$(20,000)**	$ 220,000

SO 7 Identify the relevant costs in deciding whether to eliminate an unprofitable segment.

Types of Incremental Analysis

Eliminate an Unprofitable Segment

Prepare income data after eliminating Champ product line. Assume fixed costs are allocated 2/3 to Pro and 1/3 to Master.

Illustration 7-16

	Pro	Master	Total
Sales	$800,000	$300,000	$1,100,000
Variable expenses	520,000	210,000	730,000
Contribution margin	280,000	90,000	370,000
Fixed expenses			
Net income			

Total income is decreased by

Solution on notes page

SO 7 Identify the relevant costs in deciding whether to eliminate an unprofitable segment.

Types of Incremental Analysis

Eliminate an Unprofitable Segment

Incremental analysis of Champ provided the same results:

Do Not Eliminate Champ

Illustration 7-17

	Continue	Eliminate	Net Income Increase (Decrease)
Sales	$100,000	$ 0	$(100,000)
Variable costs	90,000	0	90,000
Contribution margin	10,000	0	(10,000)
Fixed costs	30,000	30,000	0
Net income	$ (20,000)	$(30,000)	$ (10,000)

SO 7 Identify the relevant costs in deciding whether to eliminate an unprofitable segment.

Types of Incremental Analysis

Review Question

If an unprofitable segment is eliminated:

a. Net income will always increase.

b. Variable expenses of the eliminated segment will have to be absorbed by other segments.

c. Fixed expenses allocated to the eliminated segment will have to be absorbed by other segments.

d. Net income will always decrease.

Solution on notes page

SO 7 Identify the relevant costs in deciding whether to eliminate an unprofitable segment.

Other Considerations in Decision Making

Qualitative Factors

- Potential effects of decision on existing employees and the community.
- Cost savings that may be obtained from outsourcing or from eliminating a plant should be weighed against these qualitative attributes.
- Cost of lost morale that might result.

Other Considerations in Decision Making

Relationship of Incremental Anaysis and Activity-Based Costing

- Many companies have shifted to activity-based costing (ABC).
- The primary reason for using ABC is that it results in a more accurate allocation of overhead.
- ABC will result in better identification of relevant costs and, therefore, better incremental analysis.

SO 7 Identify the relevant costs in deciding whether to eliminate an unprofitable segment.

Management Insight

What Is the Real Cost of Packaging Options?

The existence of excess plant capacity is frequently the incentive for management to add new products. Adding one new product may not add much incremental cost. But continuing to add products will at some point create new constraints, perhaps requiring additional investments in people, equipment, and facilities.

The effects of product and product line proliferation are generally understood. But the effect on incremental overhead costs of *changes in servicing customers* is less understood. For example, if a company newly offers its customers the option of product delivery by case or by pallet, the new service may appear to be simple and low in cost. But, if the manufacturing process must be realigned to package in two different forms; if two sets of inventory records must be maintained; and if warehousing, handling, and shipping require two different arrangements or sets of equipment, the additional costs of this new option could be as high as a whole new product. If the customer service option were adopted for all products, the product line could effectively be doubled–but so might many overhead costs.

Source: Elizabeth Haas Edersheim and Joan Wilson, "Complexity at Consumer Goods Companies: Naming and Taming the Beast," *Journal of Cost Management*.

? If your marketing director suggests that, in addition to selling your cereal in a standard-size box, you should sell a jumbo size and an individual size, what issues must you consider?

all about YOU

What Is a Degree Worth?

Some Facts

- Over a lifetime of work, high-school graduates earn an average of $1.2 million, associate's degree holders earn an average of $1.6 million, and people with bachelor's degrees earn about $2.1 million.
- A year of tuition at a public four-year college costs about $8,655, and a year of tuition at a public two-year college costs about $1,359.

Some Facts

- There has also been considerable research on other, less-tangible benefits of post–high-school education. For example, some have suggested that there is a relationship between higher education and good health. Research also suggests that college-educated people are more optimistic.
- About 600,000 students drop out of four-year colleges each year.

What Do You Think?

Each year many students decide to drop out of school. Many of them never return. Suppose that you are working two jobs and going to college and that you are not making ends meet. Your grades are suffering due to your lack of available study time. You feel depressed. Should you drop out of school?

YES: You can always go back to school. If your grades are bad, and you are depressed, what good is school doing you anyway?

NO: Once you drop out, it is very hard to get enough momentum to go back. Dropping out will dramatically reduce your long-term opportunities. It is better to stay in school, even if you take only one class per semester.

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