

CHAPTER 11

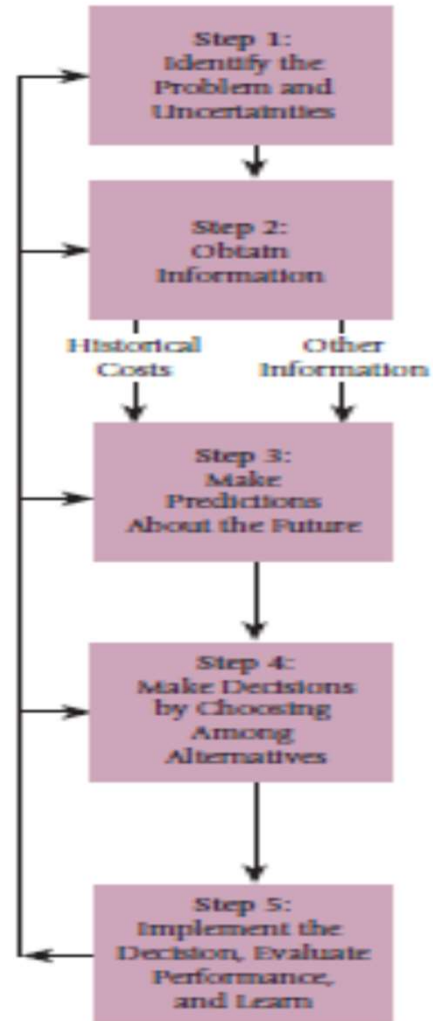
Decision Making
and
Relevant Information

INFORMATION AND THE DECISION PROCESS: DECISION MODELS

Managers usually follow a decision model for choosing among different courses of action.

- ◉ A decision model is a formal method of making a choice that often involves both quantitative and qualitative analyses.
- ◉ Management accountants analyze and present relevant data to guide managers' decisions.
- ◉ Managers use the five-step decision-making process presented in Chapter 1 to make decisions.

FIVE-STEP DECISION-MAKING PROCESS



THE CONCEPT OF RELEVANCE

- Relevant information has two characteristics:
 - It occurs in the future
 - It differs among the alternative courses of action.
- Relevant costs are expected future costs.
- Relevant revenues are expected future Revenues.
- Past costs (historical costs) are never relevant and are also called sunk costs.

TYPES OF INFORMATION

- ◉ Quantitative factors are outcomes that can be measured in numerical terms.
- ◉ Qualitative factors are outcomes that are difficult to measure accurately in numerical terms, such as satisfaction.
 - Qualitative factors are just as important as quantitative factors even though they are difficult to measure.

FEATURES OF RELEVANT INFORMATION

- ◉ Past (historical) costs may be helpful as a basis for making predictions. However, past costs themselves are always irrelevant when making decisions.
- ◉ Different alternatives can be compared by examining differences in expected total future revenues and expected total future costs.
- ◉ Not all expected future revenues and expected future costs are relevant. Expected future revenues and expected future costs that do not differ among alternatives are irrelevant and, hence can be eliminated from the analysis. The key question is always, What difference will an action make?
- ◉ Appropriate weight must be given to qualitative factors and quantitative nonfinancial factors.

RELEVANT COSTS

- Two alternatives - BZU student from outside Ramallah
 - ALT 1: Renting an apartment
 - ALT 2: Travelling daily

Give examples of relevant and irrelevant costs?

SUNK COSTS ARE IRRELEVANT IN DECISION MAKING

- ⦿ Costs that have already occurred and cannot be changed are classified as sunk costs.
- ⦿ Sunk costs are excluded because they cannot be changed by future actions.

TERMINOLOGY

- ◉ Incremental cost—the additional total cost incurred for an activity.
- ◉ Differential cost—the difference in total cost between two alternatives.
- ◉ Incremental revenue—the additional total revenue from an activity.
- ◉ Differential revenue—the difference in total revenue between two alternatives.
- ◉ Note that incremental cost and differential cost are sometimes used interchangeably in practice.

SOME TYPES OF DECISIONS THAT NEED TO BE MADE:

1. One-time-only special orders
2. Insourcing vs. outsourcing (Make-or-Buy)
3. Product-mix with capacity constraints
4. Adding/dropping decisions:
 - Customer
 - Branch

ONE-TIME-ONLY SPECIAL ORDERS

- ◉ Accepting or rejecting special orders when there is idle production capacity and the special orders have no long-run implications.
- ◉ Decision rule: Does the special order generate additional operating income?
 - Yes—accept
 - No—reject
- ◉ Compares relevant revenues and relevant costs to determine profitability.

EXERCISE: SPECIAL ORDER DECISION

Assume that Ben & Jerry's sells ice cream for \$3 per unit. The cost per unit follows:

Item	\$
Materials	\$1.00
Labor	0.45
Variable overhead	0.25
Variable marketing	0.10
Fixed costs (\$20,00 per month, 40,000 units per month)	0.50
Total cost per unit	\$2.30

One of Ben & Jerry's regular customers asked the company to fill a special order of 5,000 units at a selling price of \$2.25 per unit for a special picnic. It could be filled with Ben & Jerry's capacity without affecting total fixed costs for the month.

No variable marketing will be necessary for the special order units.

Ben and Jerry's general manager was concerned about selling the ice cream below cost of \$2.30 per unit and has asked for your advice.

Required:

1. Prepare a schedule to show the impact of providing 5,000 units of ice cream on Ben & Jerry's profits in addition to the regular production and sales of 40,000 units per month.
2. Based solely on the data given, what is the lowest price per unit at which the ice cream in the special order could be sold without reducing Ben & Jerry's profits?

SOLUTION

1: Relevant Analysis

	Without the special order	With the special order
Sales	\$120,000	\$131,250
Less: Variable costs		
Materials	40,000	45,000
Labor	18,000	20,250
Variable OH	10,000	11,250
Variable marketing	4,000	4,000
Contribution Margin	48,000	50,750
Less: fixed costs	20,000	20,000
Operating income	\$28,000	\$30,750

O.I will increase by \$2,750, ACCEPT.

2: lowest price should at least cover the relevant costs.

$$\text{Lowest price} = 1 + 0.45 + 0.25 = \$1.70$$

POTENTIAL PROBLEMS WITH RELEVANT-COST ANALYSIS

- ◉ Managers should avoid two potential problems in relevant-cost analysis:
 1. Avoid incorrect general assumptions such as that “All variable costs are relevant and all fixed costs are irrelevant.” Even in our simple example, we had irrelevant, variable marketing costs.
 2. Be aware that unit-fixed-cost data can potentially mislead managers in two ways.
(See next slide for details)

BEWARE: UNIT-FIXED-COST DATA

Unit-fixed-cost data can be misleading in two ways:

1. Fixed costs per unit may include costs that are irrelevant to a particular decision or may be irrelevant in total for a particular decision, and
2. Unit fixed costs are accurate only for that particular level of output. For this reason, managers often use total fixed costs rather than per unit data especially when output levels are a variable for a particular decision.

SHORT-RUN PRICING DECISION

A special order decision is, in many respects, a short-run pricing decision.

Sometimes, the decision is simply about setting an acceptable price.

Remember the decision rule?

Any price above incremental costs will improve operating income; however, consideration must be given to capacity constraints, current market conditions, customer demand, competition, etc.

INSOURCING V OUTSOURCING AND MAKE-OR-BUY DECISION, TERMS

- ⦿ Outsourcing is purchasing goods and services from outside vendors.
- ⦿ Insourcing means you'll produce the good (or provide the service) within the organization.
- ⦿ Decisions about whether to insource or outsource are called Make-or-Buy decisions.

INSOURCING V OUTSOURCING AND MAKE-OR-BUY DECISION RULE

- ◉ Decision rule: Select the option that will provide the firm with the lowest cost, and therefore the highest profit.
- ◉ Avoidable/ unavoidable costs, examples?

MAKE-OR-BUY DECISION, EXAMPLE

	Make	Buy
Outside Purchase price of parts		\$xxxx
Costs of Making the parts		
Direct materials	\$xxxx	
Direct labor	xxxx	
Variable overhead	xxxx	
Fixed costs	<u>xxxx</u>	<u>xxxx</u>
Total costs	\$xxxx	\$xxxx

MORE ON OPPORTUNITY COST

- ◉ Opportunity Cost is the contribution to operating income forgone by not using a limited resource in its next-best alternative use.
- ◉ Opportunity Costs are not recorded in financial accounting systems because historical record keeping is limited to transactions involving alternatives that managers actually selected rather than alternatives that they rejected.

MAKE-OR-BUY DECISION, EXTENDED

	Make	Buy
Outside Purchase price of parts		\$xxxx
Costs of Making the parts		
Direct materials	\$xxxx	
Direct labor	xxxx	
Variable overhead	xxxx	
Fixed costs	<u>xxxx</u>	<u>xxxx</u>
Total costs	\$xxxx	\$xxxx
Add: opportunity cost	<u>xxxxx</u>	<u>0</u>
Total costs	\$xxxx	\$xxxx

Opportunity cost is either added to the cost of making **OR** deducted from the cost of buying

MAKE-OR-BUY DECISION, EXTENDED

Kirkland Company manufactures a part for use in its production of hats. When 10,000 items are produced, the costs per unit are:

Direct materials	\$0.60
Direct manufacturing labor	3.00
Variable manufacturing overhead	1.20
Fixed manufacturing overhead	<u>1.60</u>
Total	<u>\$6.40</u>

Mike Company has offered to sell to Kirkland Company 10,000 units of the part for \$6.00 per unit. The plant facilities could be used to manufacture another item at a savings of \$9,000 if Kirkland accepts the offer. In addition, \$1.00 per unit of fixed manufacturing overhead on the original item would be eliminated.

Which alternative is best for Kirkland Company?

MAKE-OR-BUY DECISION, EXTENDED

	Make	Buy
Outside Purchase price of parts		\$60,000
Costs of Making the parts		
Direct materials	\$6,000	
Direct labor	30,000	
Variable overhead	12,000	
Fixed costs	<u>16,000</u>	<u>6,000</u>
Total costs	\$64,000	\$66,000
Add: opportunity cost	<u>9,000</u>	<u>0</u>
Total costs	\$73,000	\$66,000

QUALITATIVE FACTORS

- Nonquantitative factors may be extremely important in an evaluation process for each of the decisions we cover here, yet do not show up directly in calculations:
 - Quality requirements
 - Reputation of outsourcer
 - Employee morale
 - Logistical considerations—distance from plant, and so on
 - For make/buy decisions, buying can be risky, especially if sourcing internationally.

PRODUCT-MIX DECISIONS WITH CAPACITY CONSTRAINTS

Product-mix decisions are decisions managers make about which products to sell and in what quantities.

- ⦿ Decision rule (with a constraint):
 - Choose the product that produces the highest contribution margin per unit of the constraining resource (not the highest contribution margin per unit of the product).

PRODUCT MIX DECISION WITH CAPACITY CONSTRAINT, EXAMPLE

	Product A	Product B
Selling Price	\$10.00	\$30.00
Variable Cost per unit	\$ 6.00	\$15.00
Contribution Margin/unit	\$ 4.00	\$15.00
Machine Hours Required per unit	0.5	3.0

- Total fixed costs for the period are \$5,000.
 - Assume that only 2,000 machine hours are available per period.
1. What is the optimal product mix? What is the maximum obtainable operating income?
 2. if demand on product A is limited to 2,500 units only, recalculate the optional product mix

PRODUCT MIX DECISION WITH CAPACITY CONSTRAINT, EXAMPLE

1. What is the optimal product mix? What is the maximum obtainable operating income?
 - C.M per M.H
 - Product A = $4 / .5 = \$8$
 - Product B = $15 / 3 = \$5$
 - Produce the maximum allowed from Product A ($2,000 / .5 = 4,000$ units)
 - Product mix is 4,000 units of A, and 0 units of B.
 - $O.I = 4(4,000) + 15(0) - 5,000 = \$11,000$

PRODUCT MIX DECISION WITH CAPACITY CONSTRAINT, EXAMPLE

2. if demand on product A is limited to 2,500 units only, recalculate the optional product mix
 - C.M per M.H
 - Product A = $4 / .5 = \$8$
 - Product B = $15 / 3 = \$5$
 - Produce the maximum allowed from Product A (2,500 units)
 - Remaining hours = $2,000 - (2,500 * .5) = 750$ allocated to B
 - Product B = $750 / 3 = 250$ units
 - Optimal product mix is 2500 units of A and 250 units of B.

ADD/DROP DECISIONS

- ◉ When the cost object is a customer, managers must decide about adding or dropping the customer.
- ◉ Decision rule: Does adding or dropping a customer add operating income to the firm?
 - Yes—add or don't drop
 - No—drop or don't add
- ◉ Decision is based on incremental income of the customer, not how much revenue a customer generates.

ADDING/DROPPING CUSTOMER

	Customer			Total
	Vogel	Brenner	Wisk	
Revenues	<u>\$500,000</u>	<u>\$300,000</u>	<u>\$400,000</u>	<u>\$1,200,000</u>
Cost of goods sold	370,000	220,000	330,000	920,000
Furniture-handling labor	41,000	18,000	33,000	92,000
Furniture-handling equipment cost written off as depreciation	12,000	4,000	9,000	25,000
Rent	14,000	8,000	14,000	36,000
Marketing support	11,000	9,000	10,000	30,000
Sales-order and delivery processing	13,000	7,000	12,000	32,000
General administration	20,000	12,000	16,000	48,000
Allocated corporate-office costs	<u>10,000</u>	<u>6,000</u>	<u>8,000</u>	<u>24,000</u>
Total costs	<u>491,000</u>	<u>284,000</u>	<u>432,000</u>	<u>1,207,000</u>
Operating income	<u>\$ 9,000</u>	<u>\$ 16,000</u>	<u>\$ (32,000)</u>	<u>\$ (7,000)</u>

ADDING/DROPPING CUSTOMER

	V/B/W	V&B (Drop W)
Revenues	\$1,200,000	\$800,000
Cost of goods sold	920,000	590,000
Furniture handling labor	92,000	59,000
Furniture handling equipment written of as depreciation	25,000	25,000
Rent	36,000	36,000
Marketing support	30,000	20,000
Sales order and delivery process	32,000	20,000
General administration	48,000	48,000
Allocated corporate office costs	24,000	24,000
Total	(\$7,000)	(\$22,000)

ADDING OR DISCONTINUING BRANCHES OR SEGMENTS

- ⊙ Decision rule: Does adding or discontinuing a branch or segment add operating income to the firm?
 - Yes—add or don't discontinue
 - No—discontinue or don't add
- ⊙ Decision is based on incremental income of the branch or segment, not how much revenue the branch or segment generates.

ADDING/DROPPING BRANCH

	Ramallah Branch	Jericho Branch
Revenues	\$1,070,000	\$860,000
Cost of goods sold	750,000	660,000
Lease rent (renewable each year)	90,000	75,000
Wages costs	42,000	42,000
Depreciation (equipment has no disposal value)	25,000	22,000
Utilities	43,000	46,000
Allocated corporate OH	<u>50,000</u>	<u>40,000</u>
Operating income (loss)	\$70,000	(\$25,000)

Drop Jericho Branch? Prepare relevant analysis

ADDING/DROPPING BRANCH

	Ramallah and Jericho	Drop Jericho
Revenues	\$1,930,000	\$1,070,000
Cost of goods sold	1,410,000	750,000
Lease rent (renewable each year)	165,000	90,000
Wages costs	84,000	42,000
Depreciation (equipment has no disposal value)	47,000	47,000
Utilities	89,000	43,000
Allocated corporate OH	<u>90,000</u>	<u>90,000</u>
Operating income (loss)	\$45,000	\$8,000

DON'T Drop Jericho, O.I will decrease by \$37,000



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