

I. Relevant Costs in Operational Decisions

- A. Theo Epstein the 37 year old (as of spring, 2011) Executive Vice President/General Manager of the Boston Red Sox was asked in a radio interview if a player's past performance affected the negotiations for salary on future contracts. Theo replied that while a player should be treated with the utmost respect both in the press and in private negotiations that past performance was not relevant. He went on to say that allowing past performance to influence contract negotiations was the surest way to "hamstring" a franchise. It is the projected future performance of the player that provides the incentive to sign or release a player.
- B. Relevant factors in operational decisions
1. **Differential Costs/Revenues (aka Incremental Costs):** The difference in costs (revenue) between two competing alternatives.
 - a. Differential analysis is the process of analyzing competing costs and/or revenues of various alternatives.
 2. **Opportunity Cost:** Represents the cost/benefits sacrificed by making a specific decision.
 - a. Managers have limited resources so using resources for any given purpose prevents the use of those resources for a competing use.
 3. **Outlay Cost:** The actual amount of cash disbursement that results from a given decision.
 - b. Outlay cost is the accounting cost recorded on the books of the company.

II. Make-or-Buy Decisions

- A. **When Idle Facilities are available** make-or-buy decisions focus on the ability of management to accurately specify the additional costs incurred in making a product and/or the costs that can be avoided by purchasing the product from outsiders. This decision focuses on four key components:
1. the relationship between the cost of the factors of production (DM, DL and OH) if the part is manufactured in-house and the ability to avoid/decrease those cost factors if the part is purchased from outsiders;
 2. the ability of a company to insure product quality;
 3. the ability/benefit of maintaining mutually advantageous long-run relationships with suppliers;
 4. how/if the idle facilities would be used if the part is purchased from outsiders and how this decision affects the long-term plans of the company

III. Operational Decisions Regarding the Deletion or Addition of Products, Services, or Departments

- A. **Avoidable Costs:** Costs that will cease an ongoing operation is changed or deleted.
1. These are normally variable costs (both direct and indirect)
 2. These are "future differential costs" relevant to the decision
- B. **Unavoidable Costs:** Costs that will continue even if an operation is halted.
1. These are normally fixed costs (both direct and indirect)
 2. These are not "future differential costs" and so are irrelevant to the decision process
 - a. Examples include such **Common Costs** as facilities and services that are shared by users (e.g., building depreciation, heating, air conditioning, and general management expenses).

In Chapter 6 of the text the initial analysis keeps the grocery line because it provides a contribution over its avoidable fixed costs of \$50,000. After analyzing whether to keep or drop the grocery line, the analysis is extended to consider replacing groceries with expanded general merchandise. When this alternative is considered, however, the proper decision is to expand general merchandise because this option contributes \$80,000 rather than \$50,000 toward covering common and other unavoidable costs.

IV. Optimal Use of Limited Resources: Product Mix Decisions when Operating at Plant Capacity

- A. Plants operating at capacity normally have a limiting factor such as size, production capacity etc that restricts the ability to increase production/service/sales etc.
1. For example a supermarket has limited floor space
- B. Plants/facilities operating at full capacity should make decisions that produce the largest profit contribution per unit of the limiting factor
1. In the retail sales example above, the limiting resource is floor space and the focus of management should be on products using less space or using the space for shorter periods of time (i.e., greater **Inventory Turnover** - number of times the average inventory is sold per year).
 - a. Management should not emphasize those products that give the largest contribution per sales dollar or per unit of product. See **EXHIBIT 6-2** for the effect of turnover on profit.

V. Joint Product Costs: Sell or Process Further Decisions

A. Terminology:

1. **Joint Products:** manufactured products that have relatively significant sales values, and are not separately identifiable as individual products until their split-off point (e.g., chemicals, lumber, flour, and the products of petroleum refining and meatpacking).
2. **Split-Off Point:** that time in the manufacturing process where the joint products become individually identifiable
3. **Separable Costs:** costs incurred after the split-off point due to not being part of the joint process and can be exclusively identified with individual products.
4. **Joint Costs:** The costs of manufacturing joint products before the split-off point;
5. **By-Products:** A product that management has no specific intention to produce
 - a. By-products are created as an afterthought in the manufacturing process
 - b. Examples would include the use of saw dust to create kitchen cabinets;
 - c. Gasoline was originally a by-product of oil refineries...that became a joint product
5. **By-Product Costs:** The cost associated with *marketing a secondary product*,
 - a. By-Products are not allocated any of the basic production costs (DM, DL,OH) allocated to joint products.

B. The Decision to Sell at the Split-Off Point or Process Further

1. Compare the difference between incremental revenues and costs with the opportunity cost of selling the product at the split-off point.

EXHIBITS 6-3 and 6-4 provide examples of the sell or process further decision. The joint costs are included in the analysis along with the revenues generated from the sale of the other joint product. These items are not differential revenues or costs, and thus they do not affect the decision. It is important to recognize that the joint costs do not play a role in determining whether or not to process a joint product further.

VI. Keeping or Replacing Equipment

A. Terminology

1. **Depreciation:** The process of allocating the cost of an asset to the time periods that the asset is expected to benefit to the company
 - a. Depreciation is a period cost
2. **Book Value:** The original cost less accumulated depreciation
 - a. Book value is a sunk cost

Note:

1. the disposal value of old equipment and the cost of new equipment are future differential costs and therefore relevant in the decision process to keep or replace.
2. The gain or loss on disposal and the book value of the old equipment are irrelevant.
3. The tax consequences of these items (1 and 2 above) should be included in a keep-or-replace decision. See EXHIBITS 6-5 and 6-6 for an analysis of a keep-or-replace decision.

3. **Sunk Cost:** A cost incurred in a prior period.
 - a. aka historical or past cost

VII. Irrelevant Costs Revisited

A. Recall that Relevant Costs are Future Differential Costs

1. Therefore not only past costs but future costs (whether fixed or variable), that do not are irrelevant in making managerial decisions.
 - a. Salaries of top managers and obsolete inventories are given as examples of future costs that will not differ in most decisions and are, therefore, irrelevant for those decisions.

B. The use of unit costs (as opposed to total costs) in managerial decisions

1. Problems are created by using unit costs for decisions because the effect that expected volume of activity may have on a decision to replace an existing piece of equipment.
 - a. If the expected volume level is at the level used by an equipment sales representative in claiming that a cost reduction is possible, then no problem exists with the analysis.
 - b. If the expected volume level is much lower than that used by the sales representative in making his claim, a different result may occur.

VIII. Conflicts Between Decision Making and Performance Evaluation

- A. Goal Congruence: The process of designing performance evaluation systems that encourage managers to make the decisions that are in the best interest of the enterprise as a whole.
1. The example in the text presents an equipment replacement decision in which performance evaluation is based on net income and results in a poor decision.
 2. Since income in Year 1 would be less if the replacement were made, managers may choose to retain the existing equipment. The savings in Years 2, 3, and 4 are, therefore, not realized.
 - a. Failing to replace the existing equipment also allows the manager to hide the potential "loss on disposal" as depreciation expense over the remaining useful life of the old equipment.
 3. Ideally, performance would be evaluated against predictions made when making decisions. However, with the complexity of modern organizations and the innumerable decisions being made, this is often not possible.
 - a. None the less, as a future manager it is essential to keep this concept in mind.

CHAPTER 6: Quiz/Demonstration Exercises

Learning Objective 1

1. If you can work for the year and make \$25,000, but you decide to go to college, then the \$25,000 is a(n) _____.
 - a. sunk cost
 - b. outlay cost
 - c. opportunity cost
 - d. misplaced cost

2. A cost that requires a cash disbursement sooner or later is referred to as a (n) _____ cost.
 - a. outlay
 - b. opportunity
 - c. immediate
 - d. differential

3. A piece of equipment purchased last year is an example of a(n) _____.
 - a. sunk cost
 - b. relevant cost
 - c. opportunity cost
 - d. differential cost

Learning Objective 2

4. ABC Corporation produces a part that is used in the manufacture of one of its products. The costs associated with the production of 10,000 units of this part are as follows:

Direct materials	\$45,000
Direct labor	65,000
Variable overhead	30,000
Fixed overhead	<u>70,000</u>
Total Cost	<u>\$210,000</u>

Of the fixed overhead costs, \$30,000 is avoidable.

XYZ Company has offered to sell 10,000 units of the same part to ABC Corporation for \$18 per unit. Assuming there is no other use for the facilities, ABC should _____.

- a. make the part, as this would save \$1 per unit
 - b. make the part, as this would save \$3 per unit
 - c. buy the part, as this would save the company \$30,000
 - d. buy the part, as this would save the company \$3 per unit
5. Qualitative factor(s) that should be considered when evaluating a make-or-buy decision is (are) _____.
 - a. the quality of the outside supplier's product
 - b. can the outside supplier provide the needed quantities
 - c. can the outside supplier provide the product when it is needed
 - d. all of the above

Learning Objective 3

Use the following information in answering questions 6 and 7.

B Mart is a department store having three operating departments. An income statement for the most

recent month of operations appears below.

	<u>Electronics</u>	<u>Clothes</u>	<u>Toys</u>	<u>Total</u>
Sales	\$55,000	\$44,000	\$11,000	\$110,000
Variable Costs	<u>33,000</u>	<u>17,600</u>	<u>5,500</u>	<u>56,100</u>
Contribution Margin	22,000	26,400	5,500	53,900
Fixed Costs				
Direct, avoidable	(5,000)	(4,000)	(4,000)	(13,000)
Common, allocated based on sales dollars	<u>(10,000)</u>	<u>(8,000)</u>	<u>(2,000)</u>	<u>(20,000)</u>
Profit (Loss)	<u>\$ 7,000</u>	<u>\$14,400</u>	<u>(\$ 500)</u>	<u>\$ 20,900</u>

6. If B Mart were to drop the toy line and make no other changes to its operations, income for the month would be _____.
- a. \$ 20,400 b. \$ 18,400 c. \$ 21,400 d. \$ 19,400
7. The space currently being used by the toy department could be converted to a jewelry department. If this were done, sales of the jewelry are expected to be \$22,000 with variable costs of \$8,800 and avoidable direct fixed costs of \$3,000. Assuming no effects on the electronics and clothing departments, income for the month would be _____.
- a. \$ 28,200 b. \$ 28,700 c. \$ 29,600 d. some other amount

Learning Objective 4

8. When a multiproduct plant is being operated at capacity, the products that should be emphasized are those that provide the highest contribution margin _____.
- a. ratio
b. per sales dollar
c. per unit of product
d. per unit of the limited resource
7. Which of the following is not a scarce resource of a company or firm?
- a. laborers
b. floor space
c. time
d. customers

Learning Objective 5

10. Chevren Company drills for oil, and delivers it to refining companies. Currently it is selling its crude oil at \$20/barrel. Chevren has been asked to refine the oil for commercial use. For a standard of refined oil, Chevren will be paid \$30/barrel. Chevren estimates that the additional labor and refining cost involved in further processing of a barrel of oil is \$6/barrel. Chevren Company should _____.
- a. continue selling crude oil at \$20/barrel
b. sell refined oil for an increased profit of \$4/barrel
c. sell the super crude oil to another company for \$21/gallon
d. do none of these
11. A joint product should be processed beyond split-off if additional _____ from further processing exceeds _____.
- a. revenue; joint costs
b. revenue; allocated joint costs
c. revenue; allocated joint costs and additional costs of further processing
d. revenue; additional costs of further processing

Learning Objective 6

12. The book value of old equipment is irrelevant in replacement decisions because _____.
- a. it will be capitalized if the equipment is kept
 - b. it is a sunk cost
 - c. it represents a future cost that will differ between the options of replacing or keeping the equipment
 - d. it represents a future cost that will not differ between the options of replacing or keeping the equipment.
13. In analyzing whether to replace or keep existing equipment, the cost of the new equipment _____.
- a. is irrelevant because it is an historical cost
 - b. is relevant because equipment is always relevant
 - c. both A and B
 - d. represents a future cost that will differ between the options of replacing or keeping the equipment

Learning Objective 7

14. In general, a decision maker should be wary of _____.
- a. unit variable costs
 - b. unit sales prices
 - c. unit fixed costs
 - d. none of the above

CHAPTER 6: Solutions to Quiz/Demonstration Exercises

1. [c] 2. [a] 3. [a]

4. [a] The difference is \$1 per unit (\$10,000/10,000 units) in favor of making. It is easiest to see the difference in a total cost analysis:

	<u>Make</u>	<u>Buy</u>
Cost of purchasing		\$180,000
Direct materials cost	\$ 45,000	0
Direct labor cost	65,000	0
Variable overhead	30,000	0
Fixed overhead	<u>70,000</u>	<u>40,000</u>
Total cost	<u>\$ 210,000</u>	<u>\$220,000</u>

5. [d]

6. [d] Income statements for answering 6 and 7 appear below.

7. [c] Income statements for answering 6 and 7 appear below.

	<u>Keep</u>	<u>Drop</u>	<u>Add</u>
	<u>Toys</u>	<u>Toys</u>	<u>Jewelry</u>
Sales	\$11,000	\$99,000	\$121,000
Variable costs	<u>5,500</u>	<u>50,600</u>	<u>59,400</u>
Contribution margin	5,500	48,400	61,600
Fixed costs:			
Direct	(4,000)	(9,000)	(12,000)
Common	<u>(2,000)</u>	<u>(20,000)</u>	<u>(20,000)</u>
Profit (loss)	<u>\$ (500)</u>	<u>\$19,400</u>	<u>\$ 29,600</u>

The reduction in the contribution margin exceeds the reduction in the direct fixed costs and the produce line should be kept if not considering adding the jewelry. For #7, the jewelry department provides an \$8,700 higher segment margin than the toy line so it should replace produce.

8. [d] 9. [d]

10. [b] The additional revenues generated of \$10/barrel are greater than the further processing costs of \$6/barrel.

11. [d] 12. [b] 13. [d] 14. [c]