

**Foundations of Accounting & Finance**

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**Week - 08**

**Lecture – 34**

**Decision Making using Cost Accounting Information - Examples - Part III**

**Question two (make or buy decision)**

The second type of decision we will explore is the 'make or buy' decision. This decision involves determining whether to produce a product in-house or purchase it from an external supplier. When analysing this decision, we utilize a concept known as relevant costing.

Relevant costing focuses on considering only those costs that differ between the alternatives being evaluated. It is important to note that we only consider future costs, not sunk costs—costs that have already been incurred and are irrecoverable.

So, when deciding whether to make or buy a product, we compare the costs associated with each alternative. If we choose to buy the product, we need to identify the specific costs involved that differ from making the product in-house. Similarly, if we opt to make the product ourselves, we assess the costs unique to that alternative.

Let us go back to the problem:

Fillip Corporation makes 4,000 units of part U13 each year. This part is used in one of the company's products. The company's Accounting Department reports the following costs of producing the part at this level of activity:

|                                   | Per unit |
|-----------------------------------|----------|
| Direct materials                  | \$ 6.20  |
| Direct labor                      | \$ 4.40  |
| Variable manufacturing overhead   | \$ 6.80  |
| Supervisor's salary               | \$ 2.50  |
| Depreciation of special equipment | \$ 8.60  |
| Allocated general overhead        | \$ 7.00  |

An outside supplier has offered to make and sell the part to the company for \$21.60 each. If this offer is accepted, the supervisor's salary and all of the variable costs, including direct labor, can be

avoided. The special equipment used to make the part was purchased many years ago and has no salvage value or other use. The allocated general overhead represents fixed costs of the entire company. If the outside supplier's offer were accepted, only \$3,000 of these allocated general overhead costs would be avoided. In addition, the space used to produce part U13 would be used to make more of one of the company's other products, generating an additional segment margin of \$13,000 per year for that product.

What would be the impact on the company's overall net operating income of buying part U13 from the outside supplier?

### **Solution**

Let us address problem number 2 regarding the decision to make or buy the product. We will consider both options: making the product and buying it. The number of units remains constant at 4000 units for both scenarios.

Our focus here is on identifying the relevant costs, those that are pertinent to the decision-making process. These are the costs that differ between making the product in-house and purchasing it externally. Let us proceed with analysing these relevant costs.

#### ***Direct material and labor***

First, let us consider the cost of direct materials. The cost per unit of direct materials is \$6.20, and since we are manufacturing 4000 units, the total cost of direct materials comes to \$24,800. If we choose to buy the product instead, we won't incur any direct material costs initially. However, we will factor in the cost of purchasing later.

Moving on to direct labour, the cost per unit of direct labour is \$4.40. Multiplying this by the 4000 units we're manufacturing gives us a total direct labour cost of \$17,600.

#### ***Variable manufacturing overhead, supervisor salary***

For variable manufacturing overhead, the cost per unit is \$6.80. Multiplying this by the 4000 units gives us the total variable manufacturing overhead cost of \$27,200. If we choose to buy the product, we won't incur any variable manufacturing overhead costs.

Next, let us consider the supervisor salary. The rate of supervisor salary is \$2.50 per unit. Multiplying this by the 4000 units gives us the total supervisor salary cost of \$10,000. Again, if we buy the product, we won't have any supervisor salary costs.

#### ***Depreciation***

Depreciation is considered an irrelevant cost in this decision-making process because it remains the same regardless of whether we choose to manufacture or not. The depreciation cost of \$8.6 per unit, multiplied by the 4000 units, gives us a total depreciation cost of \$34,400. However, since

this cost does not vary between the alternatives, it is irrelevant to our decision. Therefore, we will not consider depreciation in our analysis.

***Allocated general overhead***

If the outside supplier's offer were accepted, only \$3,000 of these allocated general overhead costs would be avoided. Therefore, only the 3000 relevant overhead costs should be considered in our decision-making process. The remaining 25000 is irrelevant as it does not differ between the alternatives of manufacturing or buying the product. Hence, it does not affect our decision.

Let us proceed to the next aspect of the problem by reviewing the details provided in the statement.

***In addition, the space used to produce part U13 would be used to make more of one of the company's other products, generating an additional segment margin of \$13,000 per year for that product.***

If you choose to make the product, you will forego generating an additional 13000 in revenue. This represents the opportunity cost of manufacturing the product. However, if you decide not to make the product, you can earn that 13000, which is why it is considered an opportunity cost rather than revenue. Now, let us consider the scenario where you buy the product instead. The purchase price is 21.60 per unit, so the total cost of purchasing 4000 units would be 86400. Comparatively, if you manufacture the product, the total cost amounts to 95600. Therefore, purchasing the product results in lower costs compared to manufacturing it.

***Decision***

The decision is to buy the product rather than manufacture it. The incremental profit gained from buying the product is 9200.

|                                    | <b>Make the product</b> | <b>Buy the product</b> |
|------------------------------------|-------------------------|------------------------|
| Units                              | 4,000                   | 4,000                  |
|                                    | <b>RELEVANT COST</b>    |                        |
| Direct materials @ 6.20            | 24,800                  | -                      |
| Direct Labor @4.40                 | 17,600                  | -                      |
| Variable manuf OH @ 6.80           | 27,200                  | -                      |
| Supervisor's salary @ 2.50         | 10,000                  | -                      |
| Deppreciation                      |                         |                        |
| Allocated general overhead         | 3000                    | -                      |
| opportunity cost                   | 13000                   | -                      |
| Buy the product @ 21.60            |                         | 86,400                 |
| <b>TOTAL COST</b>                  | <b>95,600</b>           | <b>86,400</b>          |
| <b>incremental profit if I buy</b> |                         |                        |

### Questions Three (decisions in production process)

The next problem revolves around decisions in the production process, particularly in scenarios like a refinery where there are multiple stages with various outputs. Not every output at each stage may be processed further to obtain an end product. The primary objective for any company is to maximize profit. To achieve this, it is essential to understand the selling price, process costs, and determine which processes or end products would optimize profitability.

Let us get into the question:

Galluzzo Corporation processes sugar beets in batches. A batch of sugar beets costs \$51 to buy from farmers and \$14 to crush in the company's plant. Two intermediate products, beet fiber and beet juice, emerge from the crushing process. The beet fiber can be sold as is for \$20 or processed further for \$18 to make the end product industrial fiber that is sold for \$45. The beet juice can be sold as is for \$41 or processed further for \$21 to make the end product refined sugar that is sold for \$62. How much profit (loss) does the company make by processing one batch of sugar beets into the end products industrial fiber and refined sugar?

### Solutions

Let us break down the problem into its alternatives and associated costs. There are four potential options to consider:

1. Producing both industrial fiber and refined sugar.
2. Selling beet fiber and beet juice as they are.
3. Selling refined sugar and beet fiber.
4. Processing beet fiber into industrial fiber and selling beet juice as it is.

We need to determine the sale value for each of these options based on the costs provided in the problem statement, considering the various stages of processing and the associated revenues from selling the intermediate and final products.

### Sales value

Let's calculate the sale value for each of the alternatives based on the given prices:

1. **Producing both industrial fiber and refined sugar:**
  - Sale value = \$62 (refined sugar) + \$45 (industrial fiber) = \$107
2. **Selling beet fiber and beet juice as they are:**
  - Sale value = \$20 (beet fiber) + \$41 (beet juice) = \$61

**3. Selling refined sugar and beet fiber:**

- Sale value = \$20 (beet fiber) + \$62 (refined sugar) = \$82

**4. Processing beet fiber into industrial fiber and selling beet juice as it is:**

- Sale value = \$45 (industrial fiber) + \$41 (beet juice) = \$86

These are the sale values for each alternative, which will help us evaluate the profitability of each option.

**Cost at the end of first process**

The cost at the end of the first process, which involves producing beet juice and beet fiber, is the sum of the cost to buy the sugar beets from farmers and the cost to crush them in the company's plant. This cost remains constant for all four alternatives.

Given: Cost to buy sugar beets = \$51 Cost to crush sugar beets = \$14

Total cost at the end of the first process = \$51 + \$14 = \$65

**Cost at the end of second process**

The cost at the end of the second process depends on the specific products being processed.

For refined sugar and industrial fiber (  $18+21 = 39$ )

- Cost of processing refined sugar = \$21
- Cost of processing industrial fiber = \$18

For beet juice and beet fiber, there is no second process, so the cost is \$0.

Therefore, the total cost at the end of the second process varies depending on the products being processed.

For the third and fourth options it is 21 and 18 respectively.

**Ultimate profit or loss**

To determine the ultimate profit or loss for each process, we subtract the total cost from the sale value:

**1. For refined sugar and industrial fiber:**

- Sale value: \$107
- Total cost: \$65 (first process) + \$39 (second process) = \$104

- Profit:  $\$107 - \$104 = \$3$

2. For beet juice and beet fiber:

- Sale value:  $\$61$
- Total cost:  $\$65$  (first process) +  $\$0$  (second process) =  $\$65$
- Loss:  $\$61 - \$65 = \$-4$

Similarly for the third and fourth options it is  $-\$4$  and  $\$3$  respectively.

### Decision

The decision is clear: in this particular case, the optimal choice is to sell as refined sugar and industrial fiber or sell as industrial fiber and beet juice, as both options yield the same profit. The other two options are not viable as they result in losses. It is a straightforward decision, but it effectively illustrates the concept we are focusing on. If you want to delve deeper into more complex scenarios, you can refer to the textbook problems.

|                                   | <b>A</b>                           | <b>B</b>                  | <b>C</b>                     | <b>D</b>                        |
|-----------------------------------|------------------------------------|---------------------------|------------------------------|---------------------------------|
|                                   | Refined sugar and industrial fiber | Beet fiber and Beet juice | Refined sugar and beet fiber | Industrial fiber and beet juice |
| Sale value                        | 107.00                             | 61.00                     | 82.00                        | 86.00                           |
| Cost at the end of first process  | 65.00                              | 65.00                     | 65.00                        | 65.00                           |
| cost at the end of second process | 39.00                              | 0.00                      | 21.00                        | 18.00                           |
| Profit or loss                    | 3.00                               | -4.00                     | -4.00                        | 3.00                            |