Appendix A

Lecture Notes

Main theme: This appendix focuses on **pricing** products and services. It explains the **economist’s approach to pricing**, the **absorption costing approach to cost-plus pricing**, and the meaning of **target costing**.

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1. **The economist’s approach to pricing**

*Learning Objective 1: Compute the profit-maximizing price of a product or service using the price elasticity of demand and variable cost.*

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* 1. **Elasticity of demand**
     1. The **price elasticity of demand** measures the degree to which the unit sales of a product or service are affected by a change in unit price.

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* + - 1. Demand for a product is said to be **inelastic** if a change in price has little effect on the number of units sold. For example:

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* + - * 1. The demand for **designer perfumes** sold at cosmetic counters in department stores is **relatively inelastic**.
      1. Demand for a product is said to be **elastic** if a change in price has a substantial effect on the volume of units sold. For example:

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* + - * 1. The demand for **gasoline** is relatively **elastic** because if a gas station raises its price, unit sales will drop as customers seek lower prices elsewhere.
      1. Managers should set **higher (lower) markups** over cost when demand is **inelastic (elastic)**.

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* + - 1. The price elasticity of demand for a product or service can be estimated using the **formula** as shown.

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* + 1. **Nature’s Garden: Part I**
       1. Assume the information as shown with respect to the company’s two products – **apple-almond shampoo** and **strawberry glycerin soap**.

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* + - * 1. The price elasticity of demand for the apple-almond shampoo **(-1.71)** would be computed as shown.

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* + - * 1. The price elasticity of demand for the strawberry glycerin soap **(-2.34)** would be computed as shown.

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The price elasticity of demand for the strawberry glycerin soap is **larger**, in absolute value, than the apple-almond shampoo. This indicates that the demand for strawberry glycerin soap is **more elastic** than the demand for apple-almond shampoo.

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#### The profit-maximizing price

* + 1. Under certain conditions, the profit-maximizing price can be determined by marking up **variable cost** using the formula as shown.

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* + 1. **Nature’s Garden: Part II**
       1. Assuming the apple-almond shampoo has a variable cost of $2.00 per unit, the profit-maximizing price for apple-almond shampoo of **$4.82** would be computed as shown.

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* + - 1. Assuming the strawberry glycerin soap has a variable cost of $0.40 per unit, the profit-maximizing price for strawberry glycerin soap of **$0.70** would be computed as shown.

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* + - * 1. The **75%** markup for the strawberry glycerin soap is lower than the **141%** markup for the apple-almond shampoo. This is because the demand for strawberry glycerin soap is **more elastic** than the demand for apple-almond shampoo.
      1. The graph that is shown depicts how the profit-maximizing markup is generally affected by how sensitive unit sales are to price.

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* + - * 1. For example, if a **10%** increase in price leads to a **20%** decrease in unit sales, then the optimal markup on variable cost according to the exhibit is **75%** – the figure computed for the strawberry glycerin soap. Notice:

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The optimal selling prices computed using this approach are based on **two factors** – the **variable cost per unit** and **how sensitive unit sales are to changes in price**.

While **fixed** costs are relevant when deciding whether to offer a product, they **are not relevant** **when deciding how much to charge for the product**.

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* + 1. **Nature’s Garden: Part III**
       1. Assuming the information as shown, we can verify that a 10% price increase makes sense for Nature’s Garden as follows:

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* + - * 1. The contribution margin earned at the current selling price of **$0.60** is **$40,000**.
        2. The contribution margin earned at a selling price of **$0.66** is **$41,600**.

Although the number of units sold decreases by **20%** (**from 200,000 to 160,000**), the **10%** increase in selling price (**from $0.60 to $0.66**) results in a **$1,600 increase** in contribution margin.

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1. **The Absorption Costing Approach to Cost-Plus Pricing**

*Learning Objective 2: Compute the selling price of a product using the absorption costing approach.*

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#### The cost base

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* + 1. Under the absorption approach to cost-plus pricing, **the cost base is the absorption costing unit product cost rather than the variable cost**.

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* + - 1. The cost base includes **direct materials**, **direct labor**, and **variable** and **fixed manufacturing overhead**.

#### Setting a target selling price

* + 1. **Ritter Company: Part I**
       1. Assume that Ritter Company intends to manufacture 10,000 units of a redesigned product that has the cost estimates as shown. Also, assume that the company typically uses a 50% markup percentage.

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* + - * 1. The **first step** in the absorption costing approach to cost-plus pricing is to compute the unit product cost. For Ritter, the unit product cost of **$20** would be computed as shown.

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* + - * 1. The **second step** is to calculate the target selling price (**$30**) by assigning the appropriate markup (**$10**) to the unit product cost (**$20**).

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#### Determining the markup percentage

* + 1. A markup percentage can be based on an industry “rule of thumb,” company tradition, or it can be explicitly calculated.

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* + - 1. The equation for calculating the markup percentage on absorption cost is as shown. Notice:
         1. The markup must be high enough to cover **S, G & A expenses** and to provide an adequate **return on investment**.

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* + 1. **Ritter Company – Part II**
       1. Assume that Ritter Company: (1) must invest **$100,000** to produce the redesigned product mentioned above, and (2) requires an **ROI of 20%**.

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* + - 1. The markup percentage of **50%** mentioned earlier would have been calculated as shown.
         1. If Ritter **actually sells** 10,000 units at a price of $30 per unit, the ROI on this product will indeed be 20%. However, if more than (less than) 10,000 units are sold the ROI will be higher than (less than) 20%.

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#### Problems with the absorption costing approach

* + 1. The absorption costing approach essentially **assumes** that customers **need** the forecasted **unit sales** and will pay **whatever price** the company decides to charge. This is flawed logic simply because customers have a choice.

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* + 1. **Ritter Company: Part III**

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* + - 1. Assume that Ritter only sells **7,000 units** at a price of **$30**, **instead of 10,000 units**.
         1. In this case, Ritter would have a **loss** of **$25,000** on the product instead of a profit of **$20,000**.

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* + - * 1. The absorption costing approach to pricing is a safe approach **only if**

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**customers choose to buy at least as many units as managers forecasted they would buy**.

1. **Target costing**

*Learning Objective 3: Compute the target cost for a new product or service.*

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#### Key concepts

#### Target costing is the process of determining the maximum allowable cost for a new product and then developing a prototype that can be made for that maximum target cost figure.

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* + - 1. The equation for computing a target cost is as shown.
      2. Once the target cost is determined, the product development team is given the responsibility of designing the product so that it can be made for no more than the target cost.

#### Reasons for using target costing

* + 1. **Two characteristics of prices and product costs include:**

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* + - 1. The **market** (i.e., supply and demand) **determines price**.
      2. Most of the cost of a product is **determined in the design stage**.
    1. Target costing was developed in recognition of these two characteristics. More specifically:
       1. Target costing **begins** the product development process **by recognizing and responding to existing market prices**.

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* + - * 1. Other approaches allow engineers to design products **without considering** market prices.
      1. Target costing focuses a company’s cost reduction efforts **in the product design stage of production**.
         1. Other approaches attempt to **squeeze costs out of the manufacturing process** after they come to the realization that the cost of a manufactured product does not bear a profitable relationship to the existing market price.

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*Helpful Hint: A new mountain bike with a carbon-fiber frame can be used as an example of target costing. Discuss the traditional development of such a new product. Engineers would draw up a design, perhaps build a prototype, and then “throw it over the wall” to the production department. After the production department figures out how to make the product, a price is set based on cost. Now ask students to describe what would happen under target costing. With target costing, the price would be set first based on what the market is likely to pay for this new bike. The target, or allowable, cost is determined by subtracting the desired profit from the market price. The design team then designs a product that can be made and sold for no more than the target cost.*

#### Handy Appliance Company – an example

* + 1. Assume the facts as shown with respect to a new product—a hand mixer with special features.

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* + 1. The target cost per mixer (**$22.50**) would be calculated as shown.

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* + - 1. This amount would be **broken down** into target costs for the various functions: manufacturing, marketing, distribution, after-sales service and so on.