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Introduction to Pricing for a Product or Service

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Setting a price for a product or service can be a challenge, as many variables factor into determination of a price. Additionally, accurate pricing can be based on values that can be difficult to know without extensive research. As a result, many companies make costly mistakes when incorrectly attempting to price a product or service.

A large portion of pricing is determined by the customer segment a company is targeting or the market it is entering. It is important to have strongly supported and reliable knowledge of a targeted customer segment before determining price. The Extension publication *Starting a New Business: Pre-Launch Research*, EC495, can help with preliminary business research. It will help identify the characteristics, demographics, and buying habits of the targeted customer. It is strongly suggested that this document, or other materials on business and customer research, be used as a reference to the pricing tactics introduced in this circular.

This publication serves as an introductory guide for pricing products and services. It presents some important terms and metrics that can be used when analyzing price. It also introduces some methods for determining a price. While the principles suggested in this curricular can be used for most products and services, there are some instances where the business objectives also affect price. They, too, are described in this document. Throughout the curricular, examples are provided to further demonstrate the curriculum presented.

Important Terms

This section introduces some important terms that should be used when determining pricing. While some terms may not be relevant for all products or services, it is important to be familiar with all terms and how they may apply to your business situation.

Revenue

Revenue is defined as the total amount of money a business receives from sales and investments. If a business does not offer credit nor has other investments, revenue is equal to sales, and the terms can be used interchangeably. Most companies closely track sales, as they are an indicator of a healthy business.

Total Revenue is equal to the price of the goods or services multiplied by the quantity of units sold, as demonstrated in the equation below:

$$R = Price \times Quantity$$

Costs

Costs are anything that contributes to the expense of the product or service provided by a business. When evaluating price, it is important to know all costs, as they are a significant variable for business profitability. In the equation for **Profitability, P,** the **R** stands for **Revenue,** and **C** stands for **Costs:**

$$P = R - C$$

Revenue is the product of price and units sold. Knowing costs as well as other variables in this equation (e.g., projected unit sales at a certain price point) can help predict expected profitability. Knowledge of costs can also be used for terms like **Contribution Margin** (to be discussed later), which can be used to determine or evaluate a specific pricing strategy.

Costs are typically broken down into two categories — **Fixed Costs** and **Variable Costs**.

- Fixed costs are costs that are set, and neither change with different business functions nor how many sales a company makes. Sometimes referred to as **Overhead** or **Overhead Costs**, they are often incurred over time, such as rent, insurance, etc. Fixed costs can also include one-time costs associated with launching a new product or service.
- Variable costs are any costs that vary with the number of products produced. This includes production costs, as well as any cost that applies to each individual sale.

Below are other examples of fixed and variable costs.

Contribution Margin

Contribution margin is a measure of product profitability on a unit basis. It is calculated by subtracting variable costs per unit from selling price. Fixed costs are ignored for this calculation.

Contribution Margin = Price - Variable Costs

Contribution margin is useful when a company is not sure about its fixed costs, or is operating in a quickly changing company landscape (a situation encountered by many startups and new ventures). It can also be used to perform a **Break-Even Analysis** (see on page 3).

Break-Even Analysis

When selling a product with a positive contribution margin there is a point at which revenue is equal to expenses — this is the **Break-Even Point**. Any sales after this point represent profit for the company. It is important for companies to know this point, as it will help determine realistic sales projections and strategies.

Example: Fixed and Variable Costs

There are many different kinds of fixed and variable costs. When calculating price, it is important to have a list of all costs (both fixed and variable) that go into a product. Failure to do so can lead to inaccurate pricing, and even lost profitability. Some examples of both fixed and variable costs are:

Fixed Costs
- Research and development
- Equipment (e.g., machinery)
- Indirect labor (i.e., used for general company operations)
- Insurance
- Rent
- Some forms of marketing (brand establishment, advertisements, etc.)
- Web hosting

Variable Costs
- Raw Materials
- Direct labor (i.e., used to assemble a product)
- Some marketing expenses (commissions, rebates, etc.)
- Credit card fees
- Shipping

As you might have noticed, some examples (such as labor or marketing) can be considered either a fixed or a variable cost. How you classify these costs depends on their function and how they relate to the overall product. For example, labor used to directly manufacture or assemble a product is a variable cost. Labor used to run operations for a company (e.g., a safety officer) would be considered a fixed cost.

When compiling costs, it is important to have a complete list of costs that are correctly classified by type. This will become important later when fixed and variable costs are used somewhat differently to calculate terms like contribution margin and break-even point.

Break-even analysis can help determine if a price point is favorable for a product or service. For example, if a company considers a certain price point, conducts a break-even analysis, and finds that the break-even point requires more sales than total potential customers, this indicates that profitability is unlikely with this selected price. While a break-even analysis will not directly be used to determine price, it does serve as an effective method for checking whether a proposed price will lead to favorable outcomes for a company.

The first step for completing a break-even analysis is to compile all costs for the product or service. These costs should be divided into variable costs and fixed costs. Calculate the contribution margin (as described in the section above) using variable costs and the proposed price. Next, divide total fixed costs by the contribution margin. This will determine the number of sales required to break even. An example of calculating break-even analysis is demonstrated below:

Example: Break-Even Analysis

A high school student recently started a business making custom airbrushed mailboxes. She is running this business out of her parents' garage, and does not need a dedicated space or real estate. It takes this student 1.5 hours to paint a single mailbox, and she would like to earn $10/hour for her labor.

The student would like to break even after one year. After factoring in other commitments, she believes she can sell 20 mailboxes in her first year at $70 per mailbox (she is a full-time student, and has many other commitments).

The first step was to list all fixed and variable costs. These were as follows:

Fixed Costs

Business license registration – $40
Airbrush and parts – $150
Airbrush painting class – $50
Reusable stencils – $10
Marketing photography – $100
Total Fixed Costs – $350

Variable Costs

Mailbox – $20/box
Paint – $5/unit sold
Labor – $15/unit sold
Shipping – $10/unit sold
Total Variable Costs – $50/mailbox

The student is considering selling the boxes for $70/unit. This value was set after interviewing many potential customers and determining the value they placed on her product. However, the student wants to make sure that at the $70 price point, she can be profitable by the end of the year. To do this, she decides to perform a break-even analysis. The first step is to calculate contribution margin.

$$\textit{Contribution Margin} = \textit{Price} - \textit{Variable Costs}$$
$$= \$70 - \$50$$
$$\textit{Contribution Margin} = \$20$$

Now that she knows her total fixed costs (TFC) and contribution margin (CM), she can calculate her Break-Even Point:

$$\textit{Break-Even} = \frac{TFC}{CM}$$
$$= \frac{\$350}{\$20}$$
$$\textit{Break-Even} = 17.5 \text{ units}$$

This means the business will become profitable after selling its 18th mailbox (for a non-even number, round up to get the number of items needed to be sold for profitability). Previously, the student assumed she could sell 20 mailboxes per year at this price. Therefore, it is safe to conclude that $70 is an acceptable price, based on customer demand and business objectives.

It is important to note that labor is included as a variable cost. Even though this is a one-person business and the owner is doing all the labor, it is still important to include this as a cost. When setting price, owners often ignore this pitfall and forget to quantify the value of their own labor. This can be hazardous for many business owners as time is often their most constrained resource. They need to value their time accordingly.

Pricing Strategies

Cost-Based Pricing (Cost-Plus Pricing)

A basic method that can be used to determine price is one based on cost, often called **Cost-Plus Pricing**. With this method, the first step is to accumulate all fixed and variable costs. The next step is to estimate sales and determine fixed costs on a unit basis. The final step is to sum up variable and unit fixed costs and add a set profit margin to determine final price. The appeal of this method is that it is simple and does not require extensive research or efforts to calculate.

In general, cost-based pricing is not recommended because it has many risks. First, this method does not consider perceived customer value so it is possible to determine a price that is out of sync with customers. Cost-based pricing can also be risky if one does not estimate costs accurately. For example, if a business overestimates the amount of product sales, which is possible due to failure to research perceived customer value, then the product's fixed costs per unit sold will be much higher than expected and the pricing scheme might not be profitable. Additionally, if costs suddenly change (e.g., due to commodity price fluctuations), a pricing scheme might not be viable. As a result, cost-based pricing is usually not recommended except for very large value, low volume sales.

Value-Based Pricing

The most effective way to price an object is based on the value it creates for customers and the customers' perceived worth. Referred to as **Value-Based Pricing**, it requires significant knowledge of a company's customers and their needs.

To calculate value-based pricing, one must compile all value propositions created by the product and calculate a monetary amount for each. Value propositions may include items such as the cost to replace a current product, labor, or costs prevented by a new product, or any other values created by the product for its end user. While other factors **can** indirectly affect price (e.g., customer knowledge of a product, competitive landscape, etc.), price should still be directly proportional to the value created.

Value-based pricing can be challenging. Errors of overestimating or underestimating value can be problematic for a business. If a company does not capture all value statements, it runs the risk of losing profitability or leaving money on the table. If a company overestimates the value created by a product or service, or customers are not knowledgeable of all the value created, the price will be set too high, thus leading to lost sales. As a result, many businesses will try an initial price and then use customer feedback to hone in on a more accurate figure.

While value-based pricing does not directly use concepts like costs or break-even point for determining price, these terms can still play an important role in pricing. Knowing costs can determine overall product profitability for a given price. Additionally, these terms can serve as a check for a proposed price and whether it fits into an overall business strategy. One optional step for value-based pricing is to examine all costs and confirm that the ultimate price will create profitable outcomes for the business.

An example of value-based pricing is in the box shown on page 5.

Retail Pricing

There are many instances when a business will not sell directly to a customer. The business will instead sell products to a retail business, which in turn will sell them to customers. Although retail businesses do not have the manufacturing costs described in earlier examples, they will have labor and overhead costs that must be covered when setting prices. As a result, they do not pay the same price a retail customer does.

The term **Wholesale Price** refers to the price a retailer pays for a product. **Retail Price** refers to the price that a retailer sets for its customers. Generally, these two prices are directly related. The retail price is usually determined by multiplying the product's wholesale price by a set percentage. The term **Markup** is used to refer to this relationship.

Retail price is typically two times the wholesale price, or a 100 percent markup. The occurrence is so common that the term **Keystone Pricing** has been branded to describe it (though high-end retailers, and others, may use different markup values). Generally, the retail price should reflect the value of a product to customers, and should be set accordingly. One effective tactic that businesses use is to employ value-based pricing to determine the retail price and then use a set markup value to determine the wholesale price. The formula below can be used to determine wholesale price using this method.

$$\textit{Wholesale Price} = \frac{\textit{Retail Price (including shipping)}}{\textit{100\% + markup percentage}}$$

Example: Pricing of Low-Failure Pipe

A company has invented a new kind of flexible piping to be used for light irrigation. It is designed to compete directly with another kind of pipe currently on the market, and it has roughly the same functionality. Whereas its main competitor has a failure rate of 10 percent per 100 feet, this new pipe has a failure rate of 2 percent. The competitor's pipe is priced at $6.50 per 100 feet. (For the purpose of this example, all pipe pricing will be for 100-foot lengths.) The company is trying to determine a price that reflects this lower failure rate.

Value for the low-failure piping comes from three separate criteria.

First, this piping replaces the older pipe, which is valued at $6.50 per 100 feet. This is sometimes referred to as the reference value. In addition, because of the lower failure rate, less replacement pipe is required. The value of pipe plus replacement materials is:

$$\frac{\$6.50 \times 110\%}{102\%} = \$7.01 \text{ per } 100 \text{ feet}$$

The new piping replaces $6.50 in old piping plus 51 cents in replacement piping.

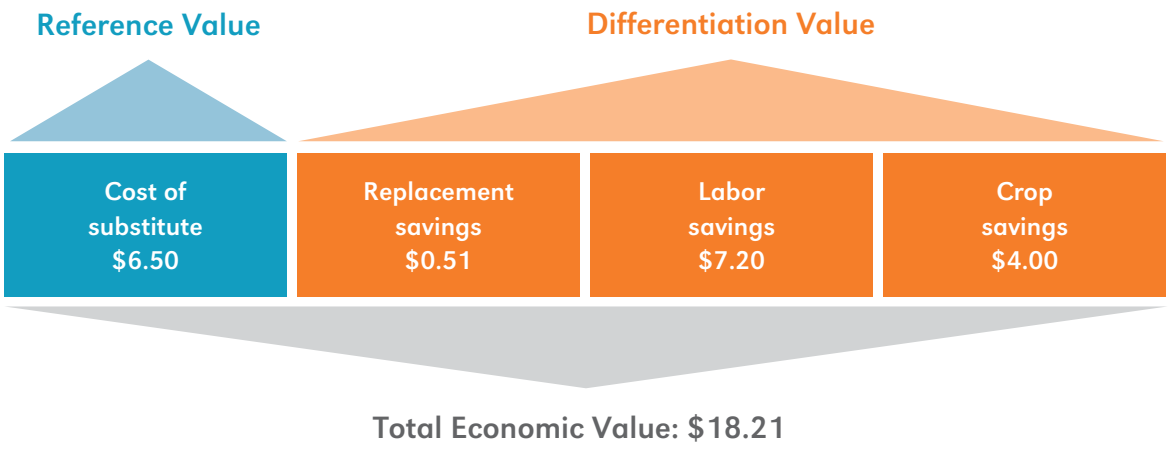
Second, failed piping can be costly to replace. Because the pipe is usually buried in the ground, it takes about three hours to dig up and replace a single failure. Assuming labor costs at $15/hour, and it takes a crew of two to replace a failure, the total labor savings per 100 feet is:

$$3 \text{ hours} \times \$30/\text{hour} \times (10\% - 2\%) = \$7.20/100 \text{ feet of pipe}$$

Finally, failed pipe can cause damage to crops that it is irrigating. An average failure causes $50 in damage due to flooding of roots. Labor savings for prevented crop damage is:

$$\$50 \times (10\% - 2\%) = \$4.00$$

When summing up all reference and differential values, the sum of all values is 18.21. This represents an upper bound for pricing this product.



While this new piping creates $18.21 in economic value, this might not end up being the final price for this product. First, customers and distributors who are used to using an older product might not want to take a risk on something new. Companies with a less established brand will often offer discounts to be competitive (in this example, the company might offer their new piping for $12.75, or a discount of 30 percent, to address this issue). Additionally, while $18.21 of value is created by this product, customers might not perceive this entire value being created (e.g., they might understand money saved from replacement pipe, but not crop damage). Sometimes, companies will dedicate marketing efforts to educating limited-information consumers to address this problem.

One final thing to note is that perceived value can vary based on the customers and their respective needs. For example, if selling the same product to a nuclear power plant, the cost of replacing a failed pipe and the cost of damage will be much higher. Even if a business is selling the same product to multiple customers, it should consider charging separate prices based on the perceived value. (Nagle and Holden, 2013)

Business Objectives

A business will have varying objectives based on business status, health, and other circumstances. These objectives can affect how a business sells products to its customers, and in return, will have an indirect effect on price. Since there is not a direct correlation between business objectives and pricing, there is no equation to model how they affect pricing. However, it is important to be aware of these situations so that a company can respond appropriately.

Maximizing Profitability

For many companies, the goal when setting price is to maximize profitability. To affect profitability, pricing can be used to influence either the number of units sold or costs. For example, some companies will employ a strategy to sell more units at a lower price, even if it means less revenue per sale. This occurs because a company can often receive discounts from suppliers for buying in large quantities. This concept, referred to as **Economies of Scale**, is sometimes employed by companies to lower costs and increase profitability, even if it decreases revenue slightly. Before attempting this strategy, a company must be able to produce and sell the needed quantities, be aware of its own capabilities, and be knowledgeable about customer demand.

Promoting Future Sales

Companies may choose to sell products that Many products that lead to further sales and business are sold. This is especially true of base products that require additional products or accessories to function in the future (e.g., printers and ink cartridges). To increase profitability, companies will often try different pricing schemes to ensure future or repeat customers.

Sometimes a company will sell a base product for less than its actual value, or even for a loss, knowing it will lead to future sales or revenue. For example, soda manufacturers will often highly subsidize or even **give** a soda fountain to restaurants, in exchange for a contract to buy soda from that producer. In return, these restaurants, which purchase large volumes of soda, will buy enough product to more than make up for the initial losses the producer has incurred. Inversely, some companies may offer a base product at a higher premium with the enticement of lower ongoing costs for the complementary, add-on products.

Switching Cost

Switching Cost is a term used to measure how easy or difficult it is to switch to a competitor's product or service. Going back to our printer example, once a person purchases a printer, he or she is then required to buy printer cartridges that fit that model, usually from the same manufacturer. The only way to buy cartridges from a competitor is to buy a whole new printer. This is an example of high switching cost.

The general rule of thumb is that the lower the switching cost, the more important it is have pricing comparable to competitors' pricing. It is also worth noting that switching cost refers not only to the financial costs of switching to a competitor's product, but also to the time and effort involved with switching. For example, if a customer puts a lot of time and effort into learning how to use a product, he or she will be more reluctant to switch to a competitor if the process has to be repeated.

The example on page 7 examines the economic viability of different pricing schemes related to this concept.

Beating Out Competitors

Almost every business has competitors with whom it is competing for a finite number of customers and sales. To succeed, a business must distinguish itself from its competitors. One tactic businesses use is lowering their price to be in line with or lower than a competing product.

While lowering price is one way for a business to compete, it is not the only method, or even the best tactic, for differentiating or setting its product apart from competitors. Other methods businesses can use for differentiation are product quality, features, or customer service. Some companies successfully set themselves apart by pricing above their competitors and causing their products to be perceived as luxury or high quality, a tactic sometimes referred to as **Premium Pricing**. The best way to address competition is through extensive research of competitors, as well as evaluation of one's own business. Having a clear idea of strengths and shortcomings compared with competitors will guide a business to the best strategy for differentiation and pricing.

Gaining Exposure/Entering a New Market

When entering a new market, it is sometimes more important to increase sales and market share than to maximize profitability. Lowering price can be an effective method to attract new customers. This can lead to additional customers trying a product and staying loyal to it in the future.

There are some risks that should be taken into account before attempting this pricing strategy. First, lower prices mean lower profitability. A company needs to ensure it has the cash flow to sustain a low profit margin for an extended period of time. Additionally, when a company returns prices to a higher, normal level, it can lead to customer backlash. Finally, lowering prices can encourage competitors to follow suit, leading to a costly price war. It is important to consider all these variables before attempting this pricing strategy.

Example: Printer and Ink Cartridge Sales

A company that designs and manufactures printers is trying to price its newest model. The printer costs $200 to produce. (Assume this represents all variable costs, and that fixed costs are negligible for this example.) The company is considering three different pricing schemes: 1) Selling the printer for $250 for a 25 percent profit margin; 2) Selling the printer at cost for $200; and 3) Selling the printer at a loss for $150.

In addition to selling the printer, customers will have to buy patented ink cartridges produced only by the company. These cartridges cost $5 to produce, and sell for $20 each. The average customer will buy three cartridges per year, and the average life of a printer is three years for a lifetime total of nine cartridges sold.

After doing some initial customer research, the company projects sales of 3,000 units using Pricing Scheme 1; 6,000 units using Scheme 2; and 9,000 units using Scheme 3.

To evaluate the optimal pricing strategy, the company looks at total profitability for each pricing scheme. Each sale will produce one printer sale and nine cartridge sales. The first step for this analysis is to calculate the contribution margin for each printer and cartridge sold. This is straightforward, as price and all costs are known.

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Contribution Margin for each pricing scheme is price minus cost.

- For Scheme 1, Contribution Margin is $250 - $200 = $50
- For Scheme 2, Contribution Margin is $200 - $200 = $0
- For Scheme 3, Contribution Margin is $150 - $200 = -$50

All cartridges are sold at the same price, and Contribution Margin is $20 - $5 = $15.

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Profitability for each pricing scheme is the sum of all contribution margins (printers and cartridges).

- For Scheme 1, total profitability is 3,000 units x $50 + 3,000 x 9 cartridges x $15 = $555,000.
- For Scheme 2, total profitability is 6,000 units x $0 + 6,000 x 9 cartridges x $15 = $810,000.
- For Scheme 3, total profitability is 9,000 units x (-$50) + 9,000 x 9 cartridges x $15 = $765,000.

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In this example, Pricing Scheme 2 produces the most profitability for the printer company. However, it is also worth noting that Pricing Scheme 3, which sells printers for a loss, creates over 35 percent more total profitability than Pricing Scheme 1, which sells printers for a profit. This shows that pricing printers for profitability alone is not the optimal approach, as it does not take advantage of locking in customers for multiple cartridge sales.

While lowering price can lead to higher overall sales, it is also important to take into account revenue lost with this strategy. Businesses considering selling a product for a loss should make sure that the cost of discounting is not greater than any additional profitability gained by lower pricing. In this example, if price is lowered too much, it would start to diminish profitability, as we saw above with Pricing Scheme 3.

While this example is fictional, many printer companies sell printers for less than they cost to produce because the switching cost for printers and cartridges is high. (A customer has to buy a whole new printer to switch to a competing product.) Companies are often aware of switching cost and how it affects future earnings. Some companies will even use patents, distribution agreements, and other tactics to keep switching costs as high as possible.

Conclusion

Accurate and effective pricing is a critical step for a business to reach profitability. Pricing strategies should be developed for all products and services and should rely heavily on understanding the customers' needs and perceived values. This publication serves as an early guide to pricing by introducing important concepts and terms, presenting methods for determining pricing, and discussing various business objectives and their effects on pricing.

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