

PRICE V. PRODUCT
A RESEARCH PLAN

Research Designs

Date

ANALYZING THE DEMAND FOR CHILDREN'S TOYS:

A RESEARCH PLAN

I. Introduction

The company's sales of children's toys have been declining over the past two quarters. On the contrary, the competitors' similar products are selling very well. The company should therefore find strategies to reverse this trend before it continually loses its share of the children's toys market.

Two hypotheses will be tested as to the decline in the company's toy sales. First, the decline may be explained by the company's uncompetitive prices relative to those of its competitors. Second, it is hypothesized that the decline in sales is because the company's toy products are not what the customers want.

In general, this study aims to determine the factors affecting the company's sales of children's toys. Specifically, it aims to:

- a) Determine the impact of the company's children's toy prices on its sales;
- b) Understand customers' behavior towards the company's children's toys; and
- c) Recommend strategies to boost the company's sales of children's toys.

The research will be undertaken over a period of two months and will be spearheaded by the Operations Director.

II. Research Methodology

A. Impact of Prices on Children's Toy Sales

Prices are very important in a market economy. They provided signals to buyers and sellers. They encourage efficient production by encouraging firms to produce goods at lowest

possible cost and determine who will receive the things produced (The Social Studies Help Center, undated).

In the following analysis, it is assumed that the company's prices are less competitive than those of its competitors. The objective of the test here is to determine the degree of influence of a price difference on the company's toy sales using own historical panel data on prices, quantity demanded of the toys and other variables. The concept of demand will provide the foundation for such analysis.

Demand refers to the quantity of a good or service that a consumer or group of consumers is willing to buy at a given price within a period of time *ceteris paribus*. The law of demand states that the higher the price of good, the less quantity of that good that is demanded, *ceteris paribus* (Ecoteacher, Undated). This relationship is shown by the downward sloping demand curve in Figure 1. In the figure, an upward movement in price (P) will lead to a reduction in the quantity (Q) of good demanded.

We know that a decrease in the quantity of a good or service sold would mean a decrease in total sales or revenue. However, if we relate it to price movement under the demand concept, it is not necessarily the case. At this point, we find importance in the concept of price elasticity of demand in our analysis, particularly the own price elasticity of demand (Note that henceforth, all mention of price elasticity would refer to own price elasticity). This is because the movement in the price of a good will influence the sales of that good depending on the price elasticity of demand for that good, since mathematically,

$$\text{Sales or revenue (R)} = \text{ P x Q} \quad (1)$$

In equation 1, P and Q are inversely related, therefore the change in sales will depend on the magnitude of the change in P and the change in Q.

The price elasticity of demand measures the responsiveness of quantity demanded Q to a change in price P. The formula for elasticity is:

$$E = \frac{\% \text{ Change in Quantity Demanded}}{\% \text{ Change in Price}} \quad (2)$$

(EconEdLink Online).

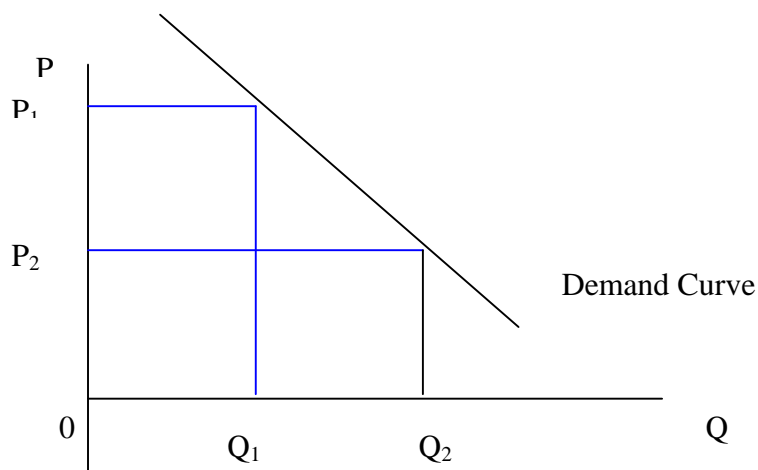


Figure 1

In figure 1,

$$E = \frac{(Q_2 - Q_1)}{(P_2 - P_1)} \times \frac{P_1}{Q_1} \quad (3)$$

To avoid asymmetry in the estimation, average values between two points is used in the estimation. This becomes the arc elasticity with the following formula:

$$\text{arc } E = \frac{\frac{(Q_2 - Q_1)}{(Q_2 + Q_1)/2}}{\frac{(P_2 - P_1)}{(P_2 + P_1)/2}} = \frac{Q_2 - Q_1}{Q_2 + Q_1} * \frac{P_2 + P_1}{P_2 - P_1}$$

If $E > 1$, demand is elastic. A price increase will decrease the sales or revenue since the revenue lost from the resulting decrease in quantity is more than the sales or revenue gained from the price increase. If $E < 1$, demand is inelastic. A price increase will increase revenue since the revenue lost from the resulting decrease in quantity is less than the revenue gained from the price increase. If $E = 1$, demand is unitary elastic. Total sales or revenue will not be affected by small increases in price (Quick MBA: Knowledge to Power Your Business, 2007).

Therefore, it will be safe to conclude that the decline in the company's children's toys sales is due to price if the demand for the good is price elastic.

1. Statistical Analysis

Price elasticity may be estimated using information from a demand schedule or a plotted demand curve using equation 3. The demand schedule presents the various quantities demanded of a particular commodity at a given price level.

For this study, however, the price elasticity of demand for the company's children's toys will be estimated from the demand function using calculus. From equation 3, we know that elasticity is simply the ratio of percentage change in quantity demanded of a good to percentage in the price. In terms of regression equation, elasticity can be estimated as the partial derivative of demand Q with respect to P .

Suppose Q is the demand function for the company's children's toys:

$$Q = F(P, R, Z, e) \quad (4)$$

Where:

F is a linear or non-linear function;

P is price of children's toys;

R is a vector of prices of other commodities, e.g. a complement or a substitute to children's toy. In this study, though, we will not dig into the details of these indicators;

Z is a vector of other factors affecting demand for children's toys; and

e is random walk or error term.

For simplicity, we will use a linear function F. The price elasticity of demand of children's toys will be:

$$E = \frac{dQ}{dP} * \frac{\text{mean } P}{\text{mean } Q} \quad (5)$$

The advantage of estimating elasticity using a regression function is that we are able to isolate the effects of other determinants of demand (prices of complement and substitute in equation 4) and the effects of random walk or error. Therefore, we come up with a more accurate estimate of price elasticity.

2. Data Requirements

The analysis will require secondary, panel data on quarterly quantity of children's toys demanded, quarterly prices of the good, and other relevant indicators, if available. Separate data for each kind of children's toy will be collected from the company's records. Likewise, separate demand and elasticity estimates will be made for each data set or each children's toy. By doing so, the company will also know which toys are contributing more to the company's total sales or which sales contributions are sensitive to price changes. These information will help the company in designing its marketing strategies.

B. Understanding Customers' Behavior Toward the Company's Toy Products

A customer's demand for a good or service is also affected by the good or service itself. Customers' questions like: "Is it what I want or need?" or "Is the product's quality up to my

standards?” determine their behavior toward a good or service. These issues can be directly associated with the desirability of the product.

To determine the customers’ attitude toward the company’s children’s toys, a primary survey will be conducted through field interviews using structured survey questionnaires. Respondents will be randomly chosen. In the survey, we would like to know and analyze the respondents’ profile, their preferences in toy products, the qualities they are looking for, and overall perception of the company’s toy products, among others. Descriptive statistics, such as frequency distribution, will be used to analyze the parameters collected in the survey.

Results derived from the analysis will be used to identify product improvements that need to be done, if any.

III. Schedule of Activities

The study will commence soon upon approval of the research plan. The first three weeks will be devoted to data gathering. The next five weeks will be spent on data analysis and report writing.

IV. Presentation of Findings

The findings will be presented by the Operations Director to the Board through a formal written report and oral presentation during its regular meeting. Presentation will include highlights of the findings.

IV Conclusions and Recommendations

Supposing it is concluded that the decline in the company’s toys sales is due to prices, the fact that the company is not able to sell at the price level at which competitors sell should be noted. It simply means that the company is not producing efficiently. Therefore, the company must figure out the optimum quantity of children’s toys that it can produce at a given time and

how to produce them at the least possible cost. For example, the company can employ an innovative production technology and shift its supply function to the right whereby the company is able to produce more from the same level of inputs or incur less cost for the same level of output. The average cost of production thus decreases and company is be able to sell at competitive prices.

Non-price actions may also be resorted to counteract the effect of price competition such as an effective marketing strategy – *e.g.* providing special services to customers.

In the analysis above, we were also able to determine which of the company's toy products are sensitive to price changes. The company may use this information in designing a pricing strategy whereby the company will benefit in terms of total sales.

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