

## RESEARCH ARTICLE

# Insurmountable Business Problems and Optimal Managerial Decisions: Significance of Elasticity of Demand

**Dr. Purnachandra Rao**

*Faculty, Amity University, Noida, New Delhi NCR, India.*

## Abstract

Managerial economics is the integration of economic tools and techniques with business practice. The concepts of managerial economics provide practical solutions to business problems. The basic aim of any business firm is profit making. The enhancement of sales is the major for making more profits. If the business entrepreneur is capable to predict the cost-output ratio, fixation of price, income of consumer and impact of advertising expenditure, the firm may improve its sales more proportionately. Therefore, to understand the behaviour of sales and to plan their growth, it is necessary to identify the factors that influence the sales and estimate their affect. For this purpose, management should integrate economic concepts with business decision making practice in order to understand and analyse the sales behaviour of the firm. In this process, the concept of elasticity of demand plays the pivotal role, which helps in providing a quantitative value for the responsiveness of the quantity demanded to change in each of the demand determinants. Therefore, this study find that the concepts of elasticity of demand are essential ingredients of optimal managerial decisions in the short run as well as long run plans of the business firm.

**Keywords:** *Managerial Economics, Business firm, Decision making, Elasticity of demand, Sales, Profit.*

## Introduction

Managerial economics is the application of economic concepts to solve the problems of decision making by the business firms which aim at achieving certain objectives subject to some constraints. The understanding of principles, models and methods of managerial economics are quite indispensable for decision-making. The branches of managerial economics like output, consumption, demand, price, market, production, cost, profit, income, etc. provide practical solutions to various business problems.

When a business firm is risked in the hope of profit maximisation, the first step it needs to analyse the dynamics of demand for the product and market conditions. Since the basic aim of the firm is profit making, the enhancement in sales become a major concern for survival of firm. The behaviour of sales and its growth is directly related with profit maximisation. If the management is capable to estimate the cost-

output ratio, fixation of price, income of the consumer and impact of advertising expenditure and competitor's strategies regarding price and production techniques, it may improve the volume of sales more proportionately. To understand the sales behaviour and its growth, it is a greater need to identify the factors that influence the sales and estimate their impact.

For this purpose, management should integrate them anagerial economic concepts with business decision making in order to understand and analyse the response of sales.

Therefore, the purpose of this study is to explore the best use of managerial economics technique sandits contribution to decision making. The main objective of the study is to analyse the sales behaviour and its growth plan with the help of managerial economic concepts.

## Sales Behaviour and Role of Managerial Economics

The principle goal of any business firm is to maximise its profits. In the scenario of making more profits the enhancement of sales volume to be paid major attention. If the business firm is able to predict the dynamics of price, income and market conditions, the firm would improve its sales. Therefore, to understand the behaviour of sales and to plan their growth, it needs to quantify the components that influence sales.

The concepts of managerial economics provide a systematic framework to logically solve these issues. Generally business enterprises take decisions under conditions of uncertainty and risks. The main reasons behind uncertainty and risks were include demand and supply, fixation of price, changes in income of the consumer, changing business environment, government policies, external influence on the domestic market, etc. Once a particular quantity of output is ready for sale, the business firm has to fix its price given the market conditions. In this situation, economic theory offers a number of analytical concepts which can be helpful for management in solving business problems. Demand analysis is one of the fundamental economic concepts that can be used in decision making process.

The factors determining demand include price of the commodity, income of the consumer, tastes and preferences of the consumer, prices of related goods, advertisement, consumer's expectations of future prices and future income, etc. In fact, the change in any demand determinant does not affect the demand of every good to the same extent. Therefore, the firm need to be deeply concerned about the impact of these factors on the quantity demanded of the product.

It is with the understanding of these impacts the firm can predict its level of sales. The firm without an adequate level of sales relative to costs cannot be successful. Fortunately, in the concepts of managerial economics, there was a tool to measure the effect of changes in any one of the demand

determinants in the demand function<sup>1</sup> that affect sales. This tool is known as elasticity of demand<sup>2</sup>, which helps in providing a quantitative value for the responsiveness of the quantity demanded to change in each of the determinants. The concept of demand elasticity uses to predict the level of sales in both present and future.

The larger the absolute value of this elasticity, the more responsive is quantity demanded to change in the determinant under consideration. While it is conceptually possible to measure elasticity of demand with respect to each of the demand determinants, however, there are certain obstacles in quantifying certain variables. For example, a scientific quantitative measure of tastes and preferences does not exist, which makes it virtually impossible to measure its elasticity. Somewhat similar problems do arise in case of expectations also, yet a somewhat approximate measure of expectations is possible. We will, therefore, consider the following elasticity measures: price elastic of demand, income elasticity of demand, cross elasticity of demand and advertising elasticity of

<sup>1</sup> A mathematical expression of the relation between quantity demanded of the commodity and its determinants is known as the demand function. When this relationship relates to the demand by an individual consumer it is known as individual demand function, while if it relates to the market it is called market demand function.

### Individual Demand Function:

$Q_d x = f(P_x, Y, P_1, \dots, P_{n-1}, T, A, E_y, E_p, u)$

Where

$Q_d x$  refers to the quantity demanded of product X

$P_x$  refers to the price of product X

$Y$  refers to the level of household income

$P_1, \dots, P_{n-1}$  refer to the prices of all other related products (include substitutes and complements)

$T$  refers to the tastes of the consumer

$A$  refers to advertising

$E_y$  refers to consumer's expected future income

$E_p$  refers to consumer's expectations about future prices

$u$  refers to all those determinants which are not covered in the list of determinants given above.

### Market Demand Function:

$Q_d x = f(P_x, Y, P_1, \dots, P_{n-1}, T, A, E_y, E_p, P, D, u)$

Where

$Q_d x, P_x, Y, P_1, \dots, P_{n-1}, T, A, E_y, E_p,$  and  $u$  are the same as in the individual demand function, while  $P$  refers to population (which reflects the size of the market), and  $D$  refers to distribution of consumers in various categories depending on income, age, etc.

<sup>2</sup>Percentage change in quantity demanded of the commodity caused by percentage change in the any of the determinants is called elasticity of demand.

$E = \text{Percentage change in quantity demanded of good X} / \text{Percentage change in determinant Z}$

$E = \Delta Q / Q / \Delta Z / Z = \Delta Q / \Delta Z \cdot Z / Q$

$E$  refers to elasticity of demand,  $\Delta$  refers to change,  $Q$  refers to quantity demanded, and  $Z$  refers to a demand determinant.

demand. If production is to be profitable, the volume of goods and services produced must be in accordance with the demand for the commodity.

Barring the perfectly competitive market, seller in every other market has to know the influence of price on quantity demanded for his product. While the price and cross elasticities of demand are useful for pricing policy, income elasticity can be used for forecasting demand for the product in future. Thus, management in the long run depend upon the knowledge of income elasticity, as the businessman can then find out the impact of changing income levels on the demand for his commodity. We thus, find that the concept of elasticity of demand is pervasive in different facets of economic decision making.

### **Elasticity of Demand and Optimal Managerial Decision Making**

Business firms have to take prudent decisions regarding the type of product, product price, purchase of inputs, pricing policy, market conditions, economic environment, sales promotion, etc. keeping in view the targets of the firm. Since future is uncertain, such tasks of decision making for the future progress of the business firm are really difficult.

The methods of managerial economics make this difficult task a bit easier and systematic. In the analysis of sales behaviour, the insights of elasticity of demand can be used for forecasting change in demand for the product due to expected change in the demand determinants<sup>3</sup>. In order to understand the behaviour of sales and to plan their growth, it is necessary to identify the factors that influence the sales and to quantify their effect. The identified factors can be classified into two categories:

- Factors that can be under control of the business firm, like price, advertising expenditure, quantity and quality of the product, etc., and

- Factors that are beyond control of the business firm, like tastes & preferences, fashion and incomes of consumers, competitors' price and strategy regarding price and advertising expenditure, etc.

The business firm needs to find out elasticity of demand for both category of factors. The former elasticity estimates to formulate optional operational policies and the latter elasticity estimates to find effective ways to respond to changes by competing firms.

*Factors that can be under control of the firm:* If demand for the product is highly price elastic, it can gain by reducing price as it would increase sales more than proportionately. Similarly, if the price elasticity is higher than advertising elasticity, the firm should better rely on price policy to expand its sales.

*Factors beyond control of the firm:* On the other hand, elasticity of sales with respect to factors beyond control of the firm suggests that firm responds in a particular manner. For example, in case cross-elasticity of demand of firm's product vis-a-vis competitors' product is high, the firm would reduce its price immediately in response to competitor's price cut as it would otherwise lose customers, sales margin and market share.

Had it been low cross-elasticity, it would not have bothered to reduce price. Similarly, when income of society increases, a low income elasticity of firm's product would prompt the firm to diversify into new product lines. Thus, we find that the elasticities of demand are essential ingredients of optimal managerial decisions in the short run as well as for the long run plans of the business firm.

Case problem study<sup>4</sup>:

Let demand equation be:  $Q_x = 2 - 5P_x + 1.5I + 2P_s + 4A$

Where  $P_x$  is price of the product;  $I$  is personal disposable income;  $P_s$  is price of substitute product, and  $A$  is the advertising expenditure.

<sup>3</sup>Change in Demand ( $\Delta Q$ ), say, due to change in price of product X may be expressed through price elasticity as follows:  $\Delta Q = \Delta Q \cdot \Delta P / \Delta P \cdot P / Q = (\Delta Q / \Delta P \cdot P / Q) \cdot \Delta P / P \cdot Q = Q \cdot E_p (\Delta P / P)$  Where  $E_p$  is the price elasticity of demand. We can similarly calculate the change in quantity ( $\Delta Q$ ) for due to income elasticity, cross elasticity and advertising elasticity. By summing up their impact we can find total change in quantity.

<sup>4</sup>Addison, W. and M. Nerlove, 1958.

Suppose at present,  $P_x=3$ ,  $I=4$ ,  $P_s=4$  and  $A=1$ . Then sale would be:

$$Q_x = 2 - 5(3) + 1.5(4) + 2(4) + 4(1) = 2 - 15 + 6 + 8 + 4 = 5 \text{ units}$$

Elasticity of demand in the above case is;

|                                  |                  |
|----------------------------------|------------------|
| Price elasticity ( $E_p$ )       | $-5(3/5) = -3$   |
| Income elasticity ( $E_i$ )      | $1.5(4/5) = 1.2$ |
| Cross elasticity ( $E_{x,y}$ )   | $2(4/5) = 1.6$   |
| Advertising Elasticity ( $E_a$ ) | $4(1/5) = 0.8$   |

Now let us use these elasticities to forecast sales for next period. Suppose, next period the firm plans to increase its price by 10 percent, personal disposable income is to go up by 5 percent, advertising expenditure by 4 percent, but price of substitute product to fall by 2 percent. Then expected sales of the firm in the next period ( $Q_t$ ) would be:

$$Q_t = Q_x + \Delta Q$$

Using estimates of elastic ties we can determine sales in next year as follows:

$$= Q_x + Q_x \cdot E_p (\Delta P/P) + Q_x \cdot E_i (\Delta I/I) + Q_x \cdot E_{x,y} (\Delta P_s/P_s) + Q_x \cdot E_a (\Delta A/A)$$

$$\begin{aligned} &= 5 + 5(-3) (10\%) + 5(1.2) (5\%) + 5(1.6) (-2\%) \\ &+ 5(0.8) (4\%) \\ &= 5 + 5(-3) (0.1) + 5(1.2) (0.05) + 5(1.6) (-0.02) \\ &+ 5(0.8) (0.04) \\ &= 5 - 1.2 \end{aligned}$$

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= 3.8 units

Therefore, elasticity of demand helps management in estimating present sales behaviour and expected sales in the future [1-11].

## Conclusion

Managerial economics provides a number of concepts which can help business firm to solve problems in business operations. This study proved that the tools and techniques of managerial economics have a greater impact on firm's principle objective of profit making.

The analysis of the study revealed that elasticity of demand was a major tool to estimate the sales behaviour of firm and its future growth plan. It can be observed from the study, the concepts of demand elasticity served as a major instrument to analyse the sales behaviour in both factors that under control of the firm and factors that beyond control of firm. Therefore, managerial economics played a dominant role in business decision making under uncertainties and risks. We thus find that the elasticities of demand and demand analysis are essential ingredients of optimal managerial decisions in the short run as well as for the long run plans of the business firm.