STUDY OF DEMAND BEHAVIOR - A MODULAR APPROACH

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A B S T R A C T

Business decisions about investments have to be guided by the careful study of market behavior. In this paper an attempt has been made to study the market behavior adopting a modular approach. The total demand of a product in a market gets influenced by a set of four major feed backs related by market saturation, capacity expansion, price fluctuations and motivational efforts. In the paper each of the feed back has been seperately discussed to arrive at a feed back structure which can be used for designing the policies related to expansion of capacity, pricing, motivational efforts etc.

INTRODUCTION

One of the most important factors for the long range policy design for any company is study of the interactions between the company and its market. The growth potential in market allows the company to expand its production activities to satisfy the demand. The total demand of any product, however, also gets influenced by other factors such as product utility and attractiveness, pricing policy of the manufacturers, sales efforts made by the manufacturers, motivational efforts etc. The business decisions about investments for expansion or modernisation in a company have to be guided by the careful study of market behaviour. The imbalances between demand and supply position forces the fluctuations of prices, capacity expansion and investment in research and development. The study of total demand behaviour of any product therefore, plays a very vital role in the long term policy design of a company. This paper attempts to simulate the dynamics created by various factors in the market. The paper lists down the important feedbacks influencing the total demand behaviour of a product in a generalised form. Each of the feedback has been separately discussed to understand the dynamics of total demand as given below.

STRUCTURE OF THE MODEL

The model structure consists of four separate modules influencing the total demand of a product. These modules list down the feedbacks which have been modelled in generating the total demand behaviour. These feedbacks have been separately studied to understand the influence of each on the total demand. The feedbacks are also inter-related and changes in one influence the other. The feed back structure developed by combining all the four modules generates the behavior of the total demand of a product. Each of the modules and the feedback giving the important variables, assumptions and the outputs are discussed below.

i)   Market Growth/Saturation Module:

This module simulates the behaviour of the total demand of product based on the scenarios of purchasing power, population growth, market price and the motivational efforts efforts made by producers. Since the influence of price and motivational efforts on total demand are being studied by separate modules, these two factors have been kept constant in this mudule. This module indicates that the total demand of a product is generated because of potential buyers in the market. The potential buyers of a product grow or decline based on the growth or decline in population and the utility factor of the product. The potential buyers generate the market demand based on the average purchasing power of the buyer and the market price of the product. (Fig. 1)

Depending on the total demand and production capacity the manufacturers supply the goods in market. These goods are purchased by the user who ultimately turn as satisfied buyers. With the increase in satisfied buyers, the potential buyer decrease. The feed back process also assumes that the goods in the market have got a life duration and the demand of the product is regenerated at the expiry of the life. The feed back loop is negative in nature and generates the behaviour of growth in total demand and its Saturation level in relation to scenarios of population and purchasing power with the buyer. Puchasing power available with the buyer is quite an important environmental factor influencing the total demand.

ii)   Investment Module:

This module simulates the behavior of investment required in relation to the gap in demand and supply in product. As the demand of a product rises, the shortages in production capacity forces the enterpreneurs to invest in the industry to meet the market demand. The additional investment generates additional production capacity
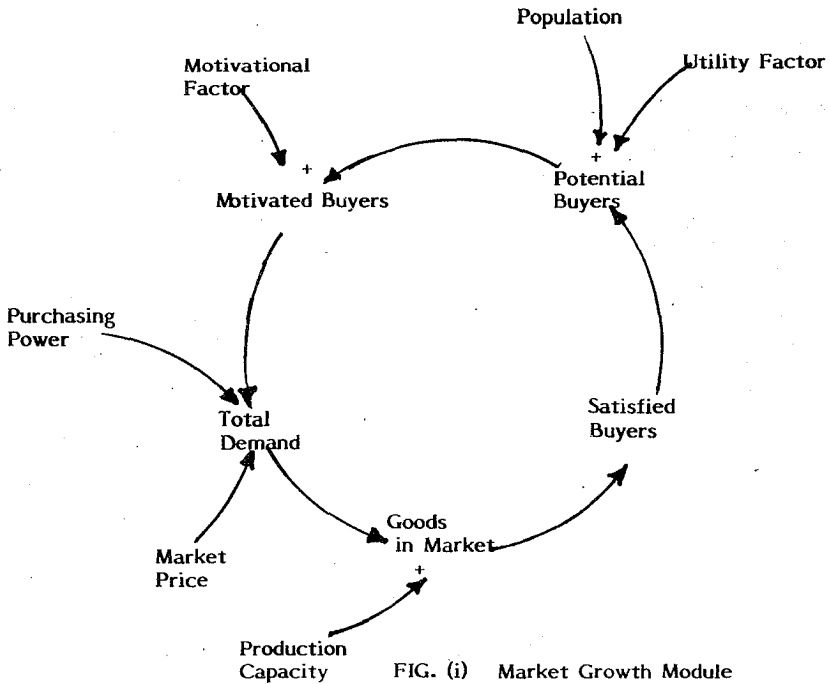
FIG. (i)   Market Growth Module

to meet the demand. The additional capacity however, is generated based on the lead time of conversion of additional investment into additional production capacity.
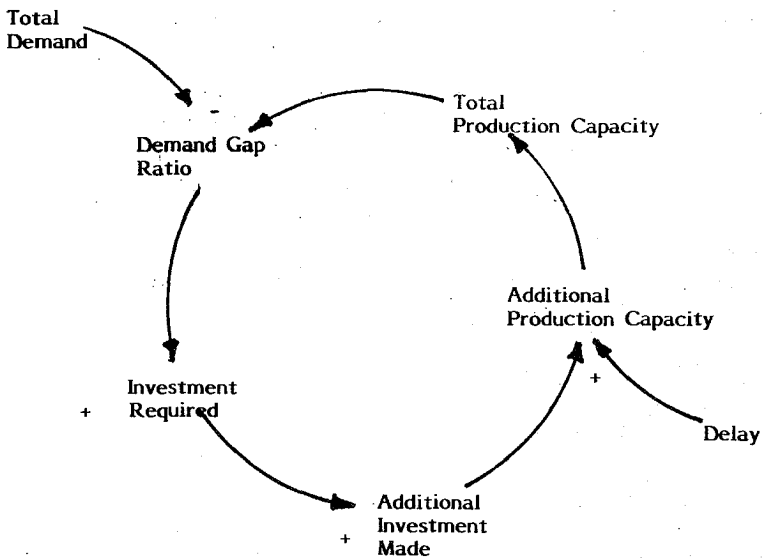

FIG. (ii)   Investment Module

The Industry however, has an option to choose its investment policy based on the demand supply gap. As the production capacity rises, the total demand decreases. The industry management therefore, has to choose the right type of investment policies to ensure that they do not end up in creating a surplus capacity. In the investment module, the demand gap is measured as a ratio of production capacity to total demand. The investment required to balance the demand gap ratio is measured by investment rate. In case of demand gap ratio greater than one there is no need of investment and the investment rate is zero. In the event of demand gap fluctuating between zero and one, the investment rate indicates the dynamic trend because of the investment policies of the industry. The industry may not like to increase its capacity to such an extent to bring the demand gap ratio to one. The actual investment made for increasing the production capacity, therefore depends on the conservative or aggressive policies of the industry.
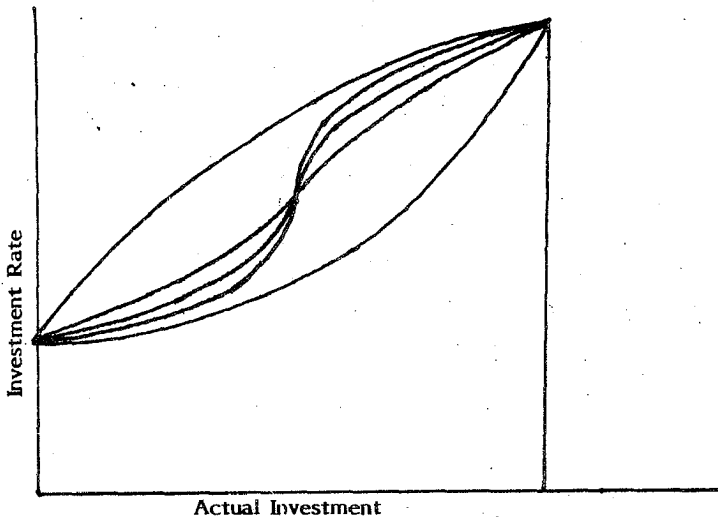

Actual Investment

fig.(iii)

Fig. (iii) indicate the different types of investment policies, the management may like to choose for making the actual expansion investment against the investment required to bridge the gap between demand and supply as indicated by demand gap ratio.

iii)   Price Behaviour Module:

This module simulates the impact of demand supply gap on the price behaviour. In any consumer product market, whenever the demand of a product is higher than its supply, there is an increase in price and vice versa. The price of any product itself reacts to adjust in accordance with the shortages existing. Fig. (iv) indicates the feedback process of price behaviour in accordance with the demand gap rates. As the demand gap ratio rises the price of the product also rises. With the increase in market price, the purchasing power of people goes down whereas on the other hand decrease in price leads to increase in purchasing power generating higher demand for the product. The feed back loop is negative in nature.
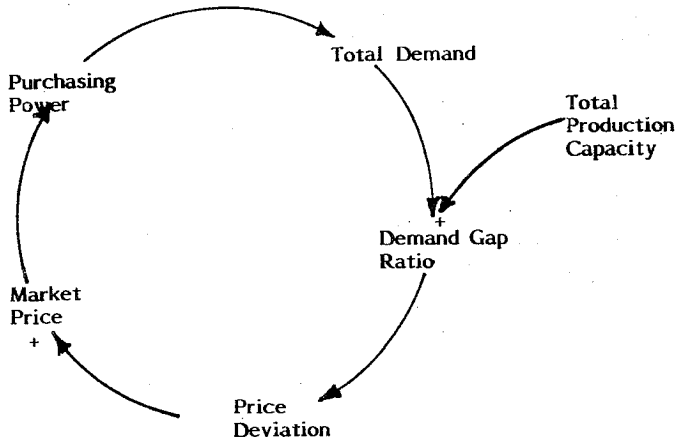
FIG. (iv)

Price Behaviour Module

The feed back loop of price behaviour allows the management in deciding its pricing policies of the product with reference to demand gap ratio. Normally the price fluctuations start only after a particular level of demand gap ratio is reached. This phenomenon is shown in Fig. (v).
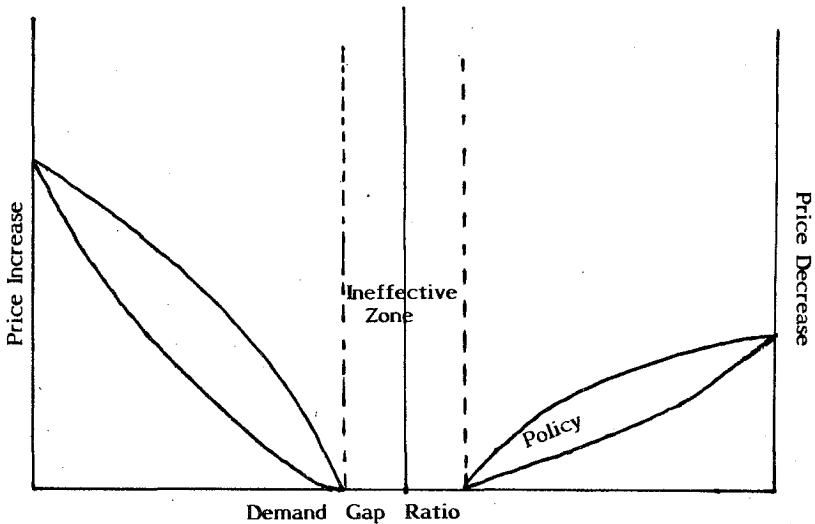

FIG. (V)

Ther is normally a zone in which if the demand gap ratio lies, there is no change on the price behaviour. This zone is called ineffective zone. Once the demand gap ratio increases or decrease further, the industry management tends to increase of decrease its price. The management can simulate the impact of various pricing policies before adopting one. An aggressive management may like to shoot up its prices even when there is a little shortages of product against the demand. A conservative management may not immediately increase its prices and may like to wait till they are sure that the shortages will continue. Management may not like to fluctuate its prices now and then as it may hamper the goodwill of the company.

iv)   **Motivational Efforts Module:**

This module relates to the motivational efforts made by the industry in the form of sales promotion activities and advertisement to create awareness about the products. The industry has to identify the target group who are in the need of the product. These type of motivational efforts one required to create awareness and knowledge about the product as well as for convinsing the individual about the utility of the product. This has to be done keeping in view the needs of the customer. The feedback loop consisting of various variables are given below in Fig. (vi). At any point in time there are certain motivated buyers in the market who are interested in buying the product. The motivated buyers generate the total demand in the market. With the increase in motivated buyers, the total demand increases. Depending on the total demand, the industry supply goods in the market. As the total demand increase the inventory of goods in stock decreases. In the event of a very high goods in stock the industry is required to make motivational efforts to create awareness in the market. This awareness is created by the industry by making investment in motivational efforts. As the investment in the motivational effort increases, the impact of these investments ensures that more and more buyers are motivated to buy the product. The feed back loop is negative in the character and guides the industry in identifying the quantum of investment requirement for motivating the buyers to increase the total demand for a particular level of goods in stock.
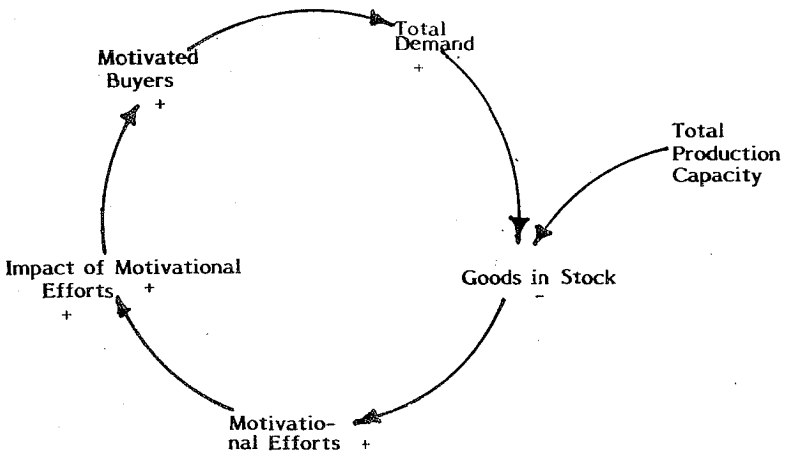

FIG. (vi)   Motivational Efforts Module

In the case of motivational efforts module let us consider advertisement as one of the motivational efforts to create awareness in the potential buyers to motivate them to buy our products. The quantum of investment required for advertisement has been considered as a function of the goods in stock at any time. The relationship between goods in stock and investment in advertisement is a management policy. Normally the management can adopt various policies as shown in Fig (vii) below.
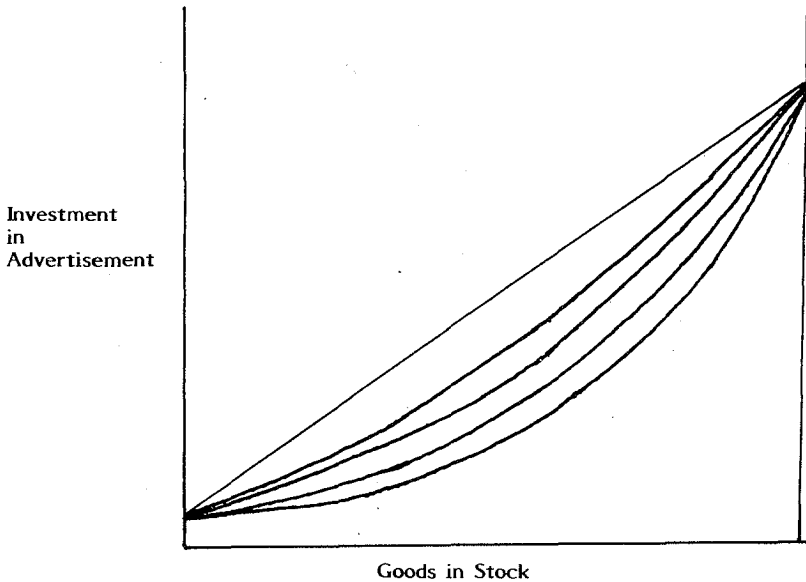

Goods in Stock

FIG. (vii)

Depending on the investment made in the advertisement, the management has to make assumptions about the likely impact of advertisement. The impact of advertisement mostly follows a steroid curve. One has to quantify the impact of advertisement based on the assumptions. The relationship between investment in advertisement and its impact is shown in Fig (viii). One has to be careful in deciding its advertisement policy as the effect of advertisement a tend decrease as the time passes. The management may therefore like to simulate various alternatives to adopt one on continuous basis. In the same manner other motivational efforts can be considered and incorporated in the motivational efforts module.

The feed back structure of total demand therefore consists of four feed backs as discussed above. Total demand is a common variable lying on the feed back loops of market growth/saturation, additional investments to be made for capacity expansion, price fluctuations and motivational efforts to create awareness about the product. Therefore it provide a common focal point and interconnects all the feed back loops. The integration of all the feed back structure as shown in Fig. (ix).
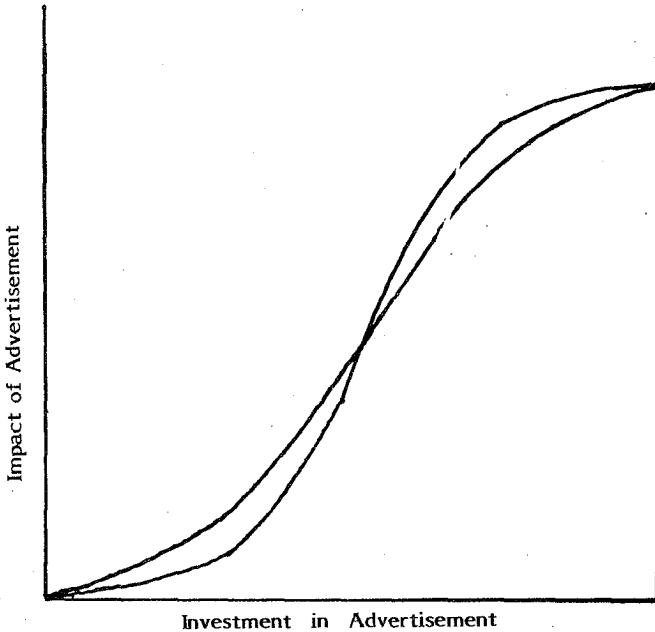
Investment in Advertisement

FIG. (viii)

Model Applications:

This simulation model consisting of four feed backs can be and to carry out a variety of experiments under controlled conditions to study the behaviour various indicators of invest. The model has the following applications:

i)   To study the behavior of total demand under a set of assumptions of population, purchasing power, utility factor, etc.

ii)   The model can be used to design the long term investment policies related to expansion of capacity based on the scenario of total demand behavior.

iii)   Since the model has a feed back related to market price, it can be used by management in designing its pricing policies for the products under the scenarios of total demand and capacity.

iv)   The model also be used for designing policies related to motivational efforts to boost the sale of its products in the market.

CONCLUSIONS:

This model discussed above simulates the impact of various management policy decisions related to market and expansion of capacity. It can be used effectively for designing right type of investment, pricing and related policies to meet the demand of a product.
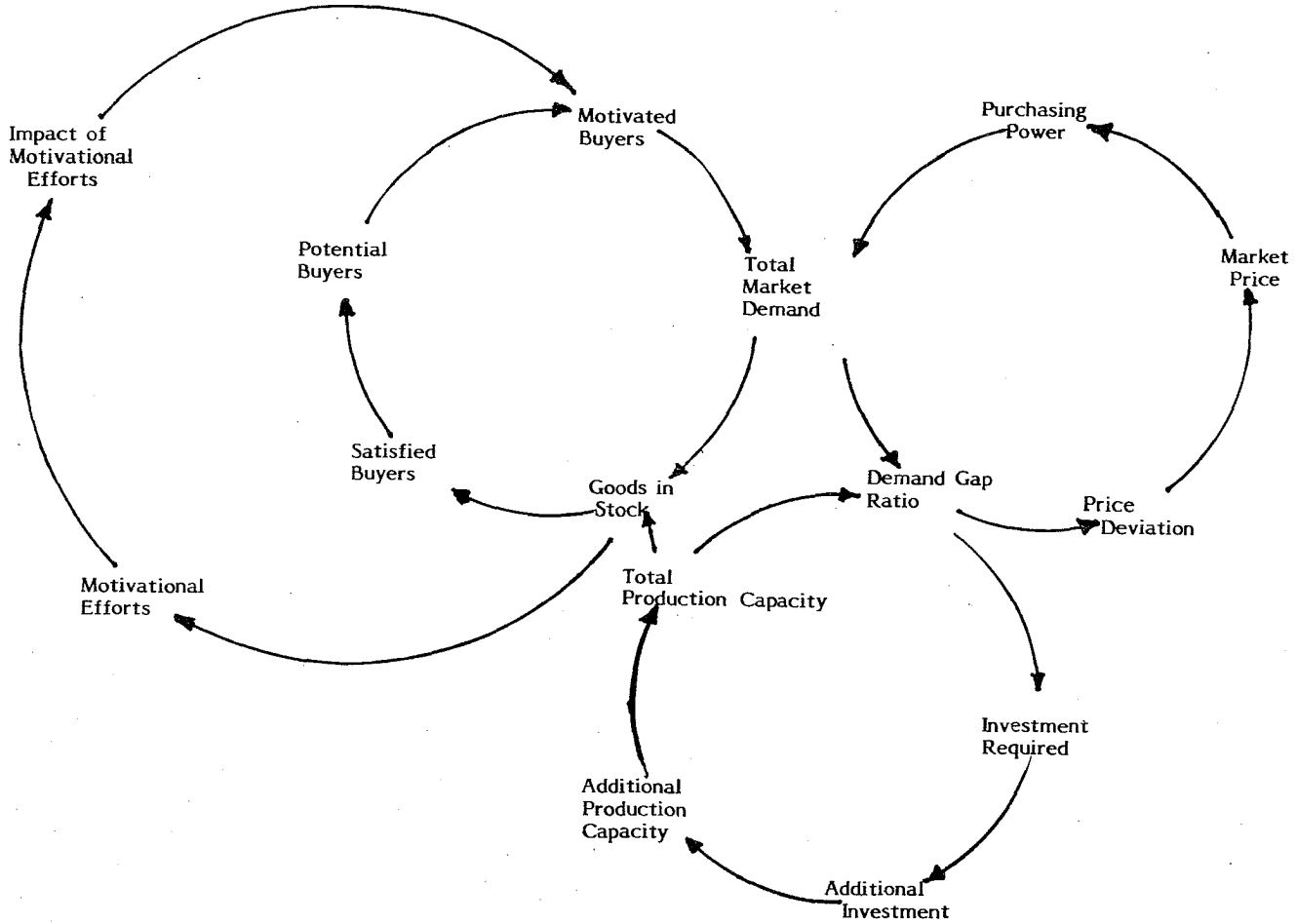
FIG. (ix)   Feed Back Structure

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