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### A New Model Theory of Deciding an Organizational Structure on The Bases Of Fluctuating Market Pattern By Applying MatLab Programming

Pankaj Aswal

Department of M.B.A,

Graphic Era University, P.O.Box-248002, Dehradun, INDIA

**Abstract:** Industrial organization is the field of economics that builds on the theory of the firm in examining the structure of, and boundaries between, firms and markets. The subject has been described as concerned with markets that "cannot easily be analyzed using the standard textbook competitive model." Industrial organization adds to the perfectly competitive. Model real-world frictions such as transaction costs limited information, and barriers to entry of new firms that may be associated with imperfect competition. It analyzes determinants of firm and market organization and behavior as between competition and monopoly including from government actions, There are different approaches to the subject. Here we are using MatLab microeconomic models to explain internal firm organization and market strategy as to strategic firm interaction, non-cooperative game theory has become the standard unifying method of analysis.

**Keywords:** Organizational structure, product analysis, MatLab simulation, Consumer behavioral pattern.

#### 1. Introduction

According to the structure-conduct-performance approach, an industry's performance (the success of an industry in producing benefits for the consumer) depends on the conduct of its firms, which then depends on the structure (factors that determine the competitiveness of the market). The structure of the industry then depends on basic conditions, such as technology and demand for a product.

Components that make up the structure, conduct, and performance model for industrial organization include:

**Basic conditions:** consumer demand, production, elasticity of demand, technology, substitutes, raw materials, seasonality, unionization, rate of growth, product durability, location, lumpiness of orders, scale of economies, method of purchase, scope economies.

**Structure:** number of buyers and sellers, barriers to entry of new firms, product differentiation, vertical integration, diversification.

**Conduct:** advertising, research and development, pricing behavior, plant investment, legal tactics, product choice, collusion, merger and contracts.

**Performance:** price, production efficiency, a locative efficiency, equity, product quality, technical progress, profits.

**Government policy:** government regulation, antitrust, barriers to entry, taxes and subsidies, investment incentives, employment incentives, macroeconomic policies.

#### 1.1 Elements of market structure

##### 1.1.1 Seller concentration

Refers to the number and size distribution of firms in the market, the most widely used device is determining seller concentration is the Concentration Ratio. Commodity markets may be characterized by concentration on the buyer side, to compute the concentration ratio; the firms are positioned in order of size in terms of sale, starting from the largest in the industry at the top and going down to the smallest firm at the bottom.

##### 1.1.2 Product differentiation

Product differentiation is a specific kind of business and marketing strategy. It focuses on a target market in which competitors already offer similar products or services, a differentiation or distinguishing a product from the products of other competing firms, differentiation of products along key features and minor details is an important strategy for firms to defend their price from leveling down to marginal cost.

##### 1.1.3 Horizontal differentiation

When products are different according to features that can't be ordered in an objective way, or in other words, Horizontal differentiation refers to distinctions in products that cannot be easily evaluated in terms of quality. Horizontally differentiated products vary only marginally, as it's more efficient for producers to try to capture as many new consumers as possible with minimal additional costs. horizontally differentiated products tend to command similar prices at equilibrium, the lack of relationship to quality does not necessarily imply that they

cost the same two products may be virtually identical in all considerations except for color or flavor and still be offered at totally different prices.

#### 1.1.4 Vertical differentiation

Vertical differentiation occurs in a market where the several goods that are present can be ordered according to their objective quality from the highest to the lowest, or one can say vertical differentiation, where the distinctions between products are objectively measurable and are based in the products respective level of quality.

#### 1.1.5 Mixed differentiation

A private and a public firm face fixed quality-dependent costs of production and compete first in quality and then either in prices or in quantities. mixed competition is always socially desirable compared to a private duopoly regardless of the type of competition in the short run and the equilibrium quality ranking.

#### 1.1.6 Buyer concentration

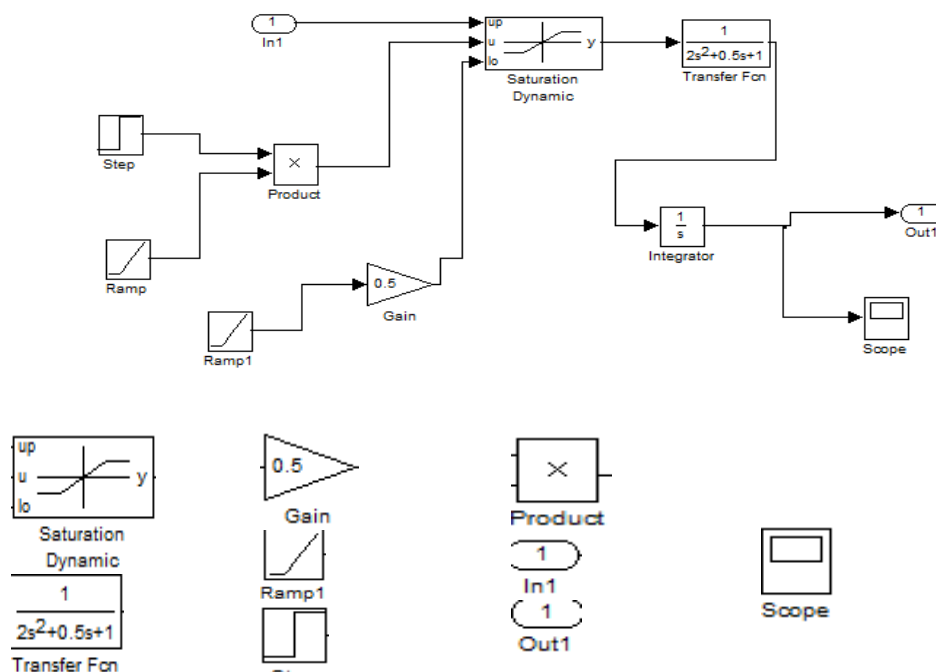
The term was used by Michael E. Porter uses in his “Five Forces Analysis”. **The threat of substitute products** the greater the number and the closer substitute products imply an increase the propensity of customers to switch between alternatives (high elasticity of demand). **The threat of the entry of new competitors** inefficient or overly profitable markets will attract more firms and capacity investment. More capacity results (for under served markets) results in decreasing profitability. The markets will always seek equilibrium even if that equilibrium is artificially imposed by barriers.

**The bargaining power of customers** also described as the market of outputs. The ability of customers to put the firm under pressure and it also affects the customer's sensitivity to price changes.

**The bargaining power of suppliers** also described as market of inputs. Suppliers of raw materials, components, labor, and services (such as expertise) to the firm can be a source of power over the firm. Suppliers may refuse to work with the firm, or e.g. charge excessively high prices for unique resources.

**The intensity of competitive rivalry** in most of the industries, this is the major determinant of the competitiveness of the industry. Sometimes rivals compete aggressively and sometimes rivals compete in non-price dimensions such as innovation, marketing, etc.

### 1.3 SCP Interaction (Simulink Model Description)



The following model depicts the SCP interaction of an organization with respect to the fluctuating market pattern, it is inclusively analyzed that market structure containing following simulink parameters as under study

- 1) **Saturation Dynamics:-** the error followed by market segment as per selective exposers, segment retain positive and negative impact on customer mind.
- 2) **Gain:-** it attain by a customer to buy a product, it may be positive or negative.
- 3) **Signals:-** outcome of customer's mind  
**Step---** steady state of customer mind, as decision about the product is achieved.  
**Ramp---** selective exposers and selective retentions increases the decision of buying the product.
- 4) **Product:-** mixing of signal Response.

- 5) *Transfer Function:-taking second order system as most of the Physical systems are second order e.g Mechanical translational system, Electrical system.*
- 6) *In, out:- the in response is added to the output of transfer function as error is generated again and again.....Appendix (figure 1)*
- 7) *Scope:- it gives the desired output curves indicates the Life span of a product in an organization.*

## 2. New Approach deciding market structure (as per MatLab simulation)

The market structure consists of the relatively stable features of the market environment that influence rivalry among the buyers and sellers operating within this market. the main elements that influence market structure are seller concentration, product differentiation , barriers to entry, barriers to exit, buyer concentration, and the growth rate of market demand. Other elements of market structure exist, but they are usually unstable and therefore ignored either because they can't be measured or because they are hard to observe. Here we are using MatLab programming to generate the most efficient data to develop market Structure, which is applicable to measurable and relatively stable quantity the relative output reaches to sustainable growth to any company.

*Program in MatLab illustrating the Results*

```
x=1;
k=1;
y1=[1 3 5 6 7]*x;
y2=[1 2 5 2 1]*k + [1 2 3 6 9]*x;
y1=y2;
plot(y1,y2);
grid on
```

*2.1 Algorithm Based on company Performance:*

1. *Input a, b, c.*
2. *Define integer a, b, c ( $a < b < c$ )*
3.  *$q(x) = ax^2 + bx + c$ .*
4.  *$p(x) = dq(x)/dt$ .*
5.  *$f(x) = \text{fit the point on curve.}$*
6.  *$x_2 = a \geq 0 : c(\text{spacing } x\text{-axis}).$*
7.  *$y_2 = (y\text{-axis}).$*
8. *Plotting  $x_2, y_2$ .*
9. *Plot on grid.*
10. *End.*

*NOTE: i) C is the highest additional feature point(Saturation Stage )*

*ii) b linear rising curve at (Growth Stage)*

*iii)  $a = 1/k$  inverted hyperbola ( Maturity Stage)*

*.....Appendix (figure2)*

## 2.2 Table and figure:

**Table1**

|   | Input parameter of life cycle –curve | p | q | f        | Saturation point |
|---|--------------------------------------|---|---|----------|------------------|
| 1 | A                                    | 2 | 4 | -1.3000  | 10.9000          |
|   | B                                    | 6 | 6 | 10.9000  |                  |
|   | C                                    | 7 | 0 | -12.6000 |                  |

*.....Appendix Figure 2*

## 3. Capital asset pricing model (CAPM)

The CAPM is a model for pricing an Companies security or a portfolio, for Company securities, we make use of the security market line (SML) and its relation to expected return and systematic risk (beta) to show how the market must price individual securities in relation to their security risk class. The SML enables us to calculate the reward-to-risk ratio for any security in relation to that of the overall market. Therefore, when the expected rate of return for any security is deflated by its beta coefficient, the reward-to-risk ratio for any company security in the market is equal to the market reward-to-risk ratio, thus:

$$\frac{E(R_i) - (R_f)}{\beta} = E(R_m) - R_f$$

where

- 1)  $E(R_i) - (R_f)$  is also known as the *risk premium*
- 2)  $\beta$  (the *beta*) is the sensitivity of the expected excess asset returns to the expected excess market returns
- 3)  $E(R_m) - R_f$  is sometimes known as the *market premium* (the difference between the expected market rate of return and the risk-free rate of return).

### 3.1 Program in MatLab illustrating the Results

```
x=1;
k=1;
y1=[1 3 5 6 7]*x;
y2=[1 2 5 2 1]*k + [1 2 3 6 9]*x;
y1=y2
plot(y1,y2);
grid on.....Appendix Figure 3CAPM Analysis
```

## 4. Conclusion

This is how firms interact and compete with each other in different situations, and the results of these interactions, and are these results consistent with an ideal competition or not. That way, an argument can be supported on whether or not action should be taken to alter the market structure or regulate market conduct. It is interesting there is such a debate on the emphasis on market structure vs. market conduct on the influence of performance since it is clear that structure and conduct are themselves influenced by each other. In industrial organization, real world, imperfect competition is studied, and there are so many different examples that the way markets are evaluated is continually evolving and changing<sup>[4]</sup>. Moreover the analysis must be constantly re-evaluated as more data is generated; here we are using MatLab programming to generate the most efficient data to develop market Structure, which is applicable to measurable and relatively stable quantity the relative output reaches to sustainable growth to any company, by evaluating a certain set of constraints we conclude that MatLab programming is suitable for forecasting the assets and its performance in particular Market.

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### Appendix

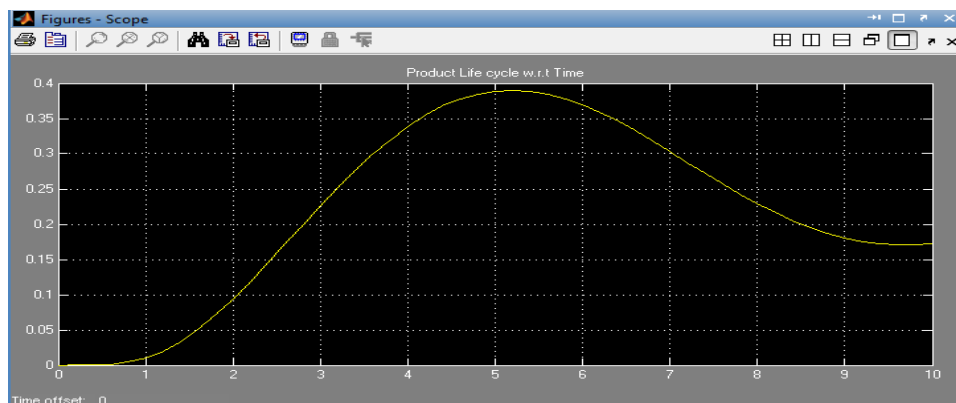


Figure1

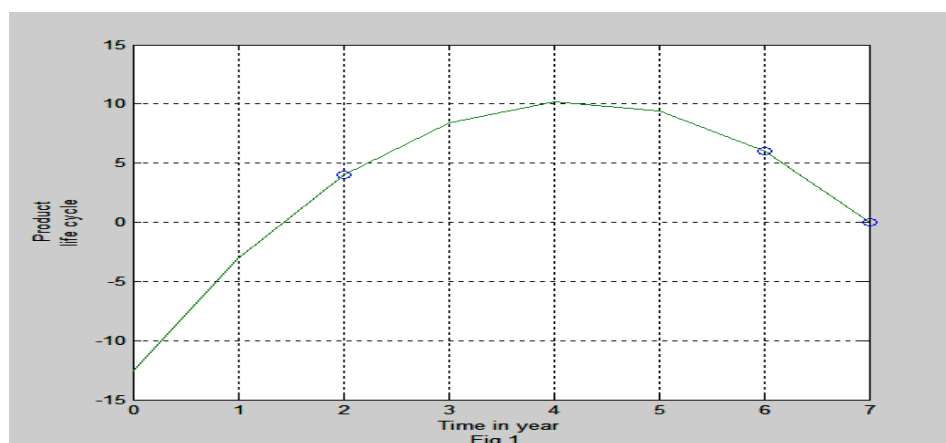


Figure 2

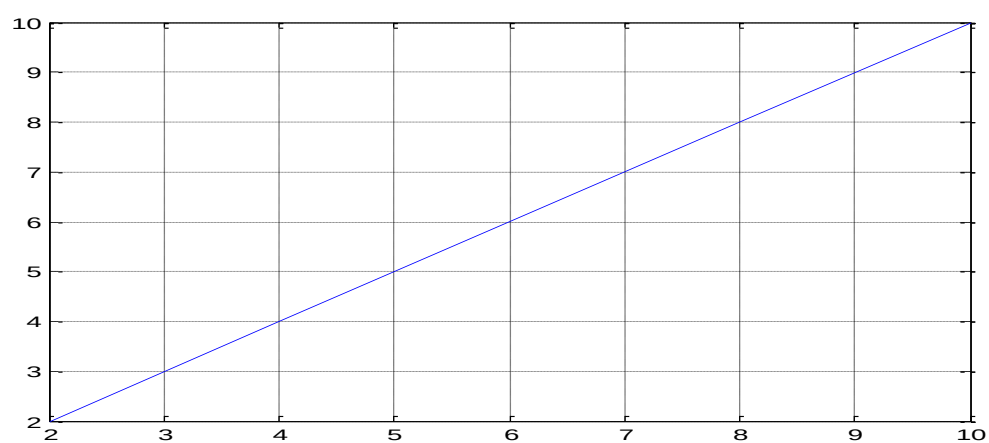


Figure 3