

# Innovative Strategy and its Welfare Implications<sup>†</sup>

*Rimi Mutsuddi\* and Indranil Mutsuddi\*\**

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*Indian corporate leaders have done well in standing up to global giants who caught them unprepared in 1991. Their companies have grown in size and market share. Some have even entered new international markets. But Indian corporations need to look beyond this into the uncertain future, in order to win the next round. Infact, business organizations would need distinct products, processes, technologies, business models and organizations so as to successfully manage these challenges. The bottom line and the key success mantra would be innovation. In this background, the paper attempts to examine some issues, which would enable organizations to explore their business strategies in order to enhance their competitiveness, through innovation and market integration. The paper also emphasizes on building empirical models to illustrate the role of innovative strategies in business organizations, and how innovation could help organizations of developing countries, to compete with technologically advanced foreign organizations. The paper attempts to depict how innovation and market integration could benefit both domestic as well as foreign organizations in the long run.*

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## Introduction

Many management authors have defined creativity as the generation of a new idea, and innovation as the translation of a new idea (Greenberg and Baron, 2003), into an organization (Apple Computer), a new product (the Sony Walkman), a new service (Federal Express's overnight delivery), a new process (one waiting line for multiple services at a bank or a multiplex-cum-shopping mall) or a new method of production (computer-aided design and manufacturing). Innovation refers to primary and gradual changes in products, processes and services. The goal of innovation is to solve a problem. Innovation may be linked to performance and growth, by bringing about improvements in efficiency, quality, competitive positioning and market share. In developed countries,

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\* Lecturer, BBM Department, Acharya Institute of Management & Sciences, Bangalore, Karnataka, India.  
E-mail: rimideroy\_19@yahoo.co.in

\*\* Lecturer, MBA Department, Acharya Institute of Management & Sciences, Bangalore, Karnataka, India.  
E-mail: i\_mutsuddi\_01@yahoo.com

industries can be characterized according to the ratio of their R&D expenditure to output sales. Nowadays, developing nations such as India, China are more or less walking in the same direction.

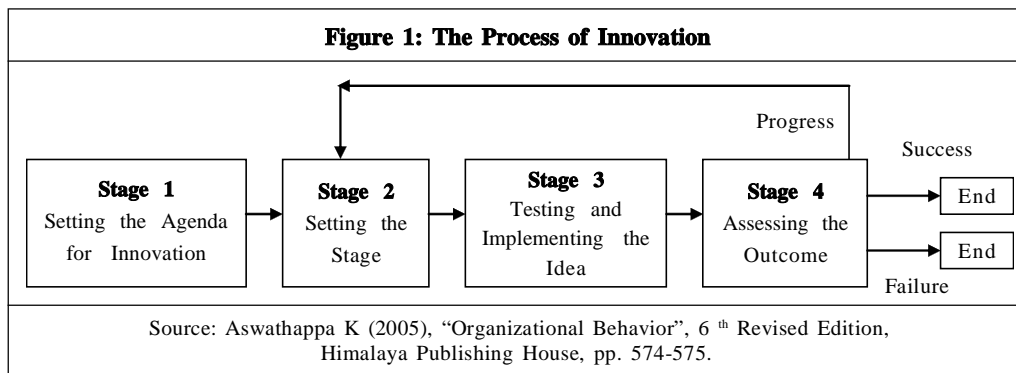
India's reputation as a rising power is based on its services and exports. In both the cases, though, reputation of the Indian companies rests largely on their ability to provide goods and services at competitive prices; they are yet to make a name globally, for creating truly innovative products and services by applying proper innovative strategies. In the Indian context, it is true that the last 15 years has been the most successful decade in the Indian history. But it is difficult to predict that the next 15 years would equally be successful. The most critical factor that may determine the consequence could well be innovation.

### **Innovation and Growth of Organizations**

Although authors have suggested that, organizational as well as industrial growth (Dumaine, 1991) could be endogenized by technological innovation, but practically this is hard to be proved. As innovation could be described as implementation of new ideas in an attempt to create value, in some cases, it could be narrowly focused—as for example, on the creation of appealing new products or services—or on the other hand, it could also tackle the daunting task of crafting effective new business models for an organization. Over the past decade, research in different industries has shown that effective innovation, at least to the extent it can be measured, is correlated to better total returns to the shareholders, and thus to high performance (Linder, 2006).

Organizational growth through innovation is a complex procedure. Innovation itself does not occur in a jiffy. The process (Linder, 2006) is spread over several stages, and consumes several months and/or years (Figure 1). In stage 1, the top management is involved in creating a conducive climate and commitment towards innovation, and motivating the employees to implement the idea. In the next stage, the broad organizational (innovation) goals are narrowed down into more specific tasks, and needed resources are gathered to meet them. At stage 3, the ideas are actually implemented. At stage 4, an assessment of the idea is made. In case the organization achieves successful results, the innovative idea is accepted and carried out in the future. In case, the opposite occurs, the idea proves to be a total failure. However, if the new idea shows hope and makes some progress towards the organization's objectives, despite problems, the process is likely to start all over again at stage 2.

In countless debates on costs and benefits of globalization and trade liberalization, one important benefit that has often been perceived for the developing countries, is that they provide impetus to the technologically backward producers (Utterback, 1974), to innovate and enhance product quality. Quality problem in developing countries is, of course, not just technological. Asymmetric information and associated problems of moral hazards and adverse selection, on the one hand, and reputation problem in the contestable nature of markets of the developing countries, on the other, are equally important factors underlying such a problem (Chiang and Manson, 1988; Donnenfeld and Mayer, 1989).



## Trade Protection and Innovation

Trade restraints impose a number of significant costs on the economy of any nation, including India. As indicated by many authors (Desai, 1980) this had been the case with India, as early as in the 1970s and 1980s. Imports in industry help in better utilization of resources, which can be used more productively. Innovation in goods and services enhances efficiency.

This is evident from differences in opinion regarding appropriate trade policy to induce technologically backward domestic industries to innovate. As indicated, in a case study of 1246 Turkish manufacturing firms, researchers did not find any impact of competition in domestic market due to imports, on innovation decisions of the firms, during 1989-93. On the other hand, contrary to the adverse impact of trade protection on innovation decisions, it had been demonstrated that tariff protection fosters innovation and prepones technological catch up; similar in spirit to the Schumpeterian idea, that monopoly power and innovation are positively related. Similar positive effect of tariff on domestic innovation has been observed in a two-stage Cournot game.

Although trade protection might restore an industry's cost competitiveness; if it failed to make cost-reducing investments because of a lack of resources and failure of developing the high quality variety through R&D and innovation (Acharyya and Bandyopadhyay, 2004). Hence, there must be gains from unprotected trade in a monopolistic market, with consumer's love for variety, which we term as product diversification.

## Innovation in Separate Markets: The Model

The World Bank's annual report on "Global Economic Prospects 2007" has indicated that by 2030, about 50% or more of the purchasing power of the global economy, would stem from the developing world. It has been suggested that the key to this would be achieved through trade liberalization and innovation.

Economists today generally acknowledge that tying/integrating multiple products in a single one can produce positive efficiencies and consumer benefits, and that a rule of reason should be adopted in evaluating its effects on markets, and the possibility that tying/integrating could create anti-competitive effects. The positive effects of tying/

integrating are particularly pronounced in the case of technical tying/integration. When the companies innovate by linking formerly separate technologies or products, efficiencies often emerge through improved performance and quality, but, they also emerge because tying/integration is often used as an aggressive strategy which leads to lower prices. Before we can discuss the advantages of market/product integration, let us investigate the consequences of innovation in the pre-integration scenario.

In the following model, we have considered the pre-integration technological limits (and asymmetry) of monopolistic firms in the two countries, through their choices of optimal innovation levels in separate national markets, where the domain of the concerned national markets and the willingness-to-pay of the domestic consumers indicate the contribution in R&D or innovation. Initially, let us consider two separate markets in two countries—home and foreign. A single native firm monopolizes each market. In such a monopolistic firm, let us consider any product with quality indicated by 's'. The decision making in both the markets follows a two-stage process. Firstly, through R&D, the firms develop a feasible range of quality within their technological limits. Secondly, both the firms select a quality (from their flexible range) and a corresponding price, to maximize their profit in their own markets. Let us also assume that innovation is certain in the monopolistic firm.

Let us assume that, the quality 's' of the product of this monopolistic firm be variable i.e., s and [0,s] (where s could be 0); and [0,š] denotes the planned range of feasible quality (š>s). So for enhancing the quality level from s to š, let the firms incur a cost (Cost for Innovation) of F (š-s). Here we can assume that, production costs are zero (for the sake of simplicity). The number of consumers in the home and the foreign country are denoted as 'n' and 'ñ' respectively. Each consumer buys, if at all, only one unit of the product. Let the utility function of the 'i<sup>th</sup>' consumer be:

$$u_i = u(s, p, \tau)$$

where,

$\tau$  is the type of the consumer, which can be interpreted as a test parameter, or a reflection of income.

p is the corresponding price and

$\tau$  shows the quality choice of the consumer.

Utility function follows the following property i.e.,

$$u_s(s, \tau, p) > 0$$

$$u_\tau(s, \tau, p) > 0 \text{ and}$$

$$U_{s\tau}(s, \tau, p) > 0, \text{ for all } s > 0 \quad \dots(1)$$

In case, the consumer does not consume the product then its reservation utility is zero. For sake of simplicity, let us consider a linear utility function:

$$u(s, p, \bar{T}) = u(s_i, \bar{T}) - p = \bar{E}_i - p$$

If the consumer consumes the product or otherwise. Hence the consumer's reservation utility is given as:

$$u(s_i, p, \bar{T}) \geq 0 \quad \dots(2)$$

which implies that,  $\bar{E}_i - p \geq 0$

The standard tie-breaking rule is adapted here, i.e., in case a consumer is indifferent between buying the product and not buying it—he buys the good.

Next, let us consider the price-quality decision of the monopolist. Optimally, at the given 's', the monopolist will push the consumers to their reservation utility by charging  $p = u(s_i, \bar{T})$ . Since there is no production costs, the monopolist's profit is as follows.

$$\begin{aligned} \pi &= n u(s_i, \bar{T}) \\ &= n s_i \bar{T} \end{aligned} \quad \dots(3)$$

Since for all  $s$ ;  $u_s(s, \bar{T}) > 0$ , it follows that the home country firm will offer the technologically feasible topmost quality,  $s(\bar{s}) = \bar{s}$ , and will charge the corresponding price,  $p(\bar{s}) = u(\bar{s}, \bar{T})$ . Thus, the consumer surplus is zero, and the profit as well as welfare equals:  $n u(s_i, \bar{T}) = n s_i \bar{T}$ .

A similar argument is applicable for the foreign firms. If the foreign consumers are assumed to have higher purchasing capacities, as compared to the domestic consumers; this difference in the purchasing capacity could be formalized by assuming that the taste/preference parameters of the foreign consumers  $\bar{T} \neq T$ , are better than the taste/preference parameter of domestic consumers. Thus from equation (1), these preferences would satisfy the following properties:

$$u(s, \bar{T}) > u(s, T) > 0 \text{ and } u_s(s, \bar{T}) > u_s(s, T) > 0 \text{ for all } s > 0 \quad \dots(4)$$

Superscript is used denote foreign market.

## Integrated Market and its Impacts

Let us now consider, that the two markets integrate, such that, the home consumers could avail the foreign quality goods and vice versa. In the new large market (emerging out of market integration) the producers would face two types of consumers i.e.,  $\lambda$  may be high type or low type.  $\lambda$  has an uniform distribution over  $T_1, T_2$ . i.e.,  $T \sim T_1, T_2$ ;  $T \in T_1$ .

The consumers also have a choice between different qualities of goods, i.e.,  $s_i \in T_1, T_2$ , we assume that there is no transport cost.

We will now carry on our analysis in three stages:

- Stage 1: Determination of  $s \in \underline{s}, \bar{s}$
- Stage 2: Determination of  $T \in \underline{T}, \bar{T}$
- Stage 3: Choice of  $p$  and  $p^*$

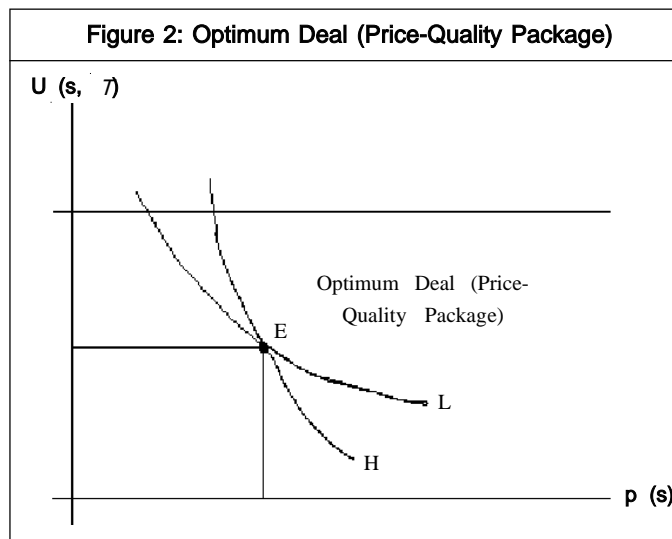
The producers must offer a deal to the consumers such that their reservation constraints as well as incentive compatible constraints are fulfilled. The optimum price-quality package would be such that the low type consumer's reservation constraint, and the high type consumer's incentive compatible constraint, must be binding. This is because if low type reservation utility is not satisfied, the producers would lose the low-type consumers, and if the high-type incentive compatible constraint is not binding, the high type will mimic the low-type consumer, and enjoy the surplus.

From equations (1) and (4), it is clear that:

$$U(s, \bar{T}) > u(s, \bar{T}) > 0$$

i.e., the high type consumer's indifference curve is flatter than the low type consumer's indifference curve. The graphical representation is given in Figure 2.

Here, E is the optimum price-quality package, which depicts that, low type reservation utility constraint and high type incentive compatible constraint are binding.



### Assumptions

- $T \in \underline{T}, \bar{T}$ ; we assume that the consumers are heterogeneous, such that there exists a market for lower quality.
- $\underline{T} \leq \bar{T}$

### Solution

We will now find the marginal consumer who is indifferent between the higher and lower quality. Let the consumer of type  $T^*$  be indifferent between  $s$  and  $s^*$  (it is also assumed that foreign firm supplies higher quality i.e.,  $s^* > s$ ).

$$\text{Therefore, } T^* s^* p^* = T^* s p,$$

$$\text{or, } T^* = p^* p / s^* s$$

All consumers of type  $T$  will go for  $s^*$  quality.

As,  $s^* > s$ , which implies that  $p^* > p$ , and all consumers of type  $T$  will go for  $s$ . Demand function is given as:

$$D_{p^*, p}^T = \int_{T'}^T (T - T') \frac{p^* - p}{s^* - s} dT'$$

[Since,  $T'$  is uniformly distributed over  $(T, \underline{T})$

$$D_{p^*, p}^{T'} = \int_T^{T'} (T' - T) \frac{p^* - p}{s^* - s} dT'$$

Profit function for both types of consumer is given as:

$$S_{p^*, p, s^*, s}^T = D_{p^*, p}^T p^* - T \frac{p^* - p}{s^* - s} s^* p^*$$

$$S_{p^*, p, s^*, s}^{T'} = D_{p^*, p}^{T'} p - \int_T^{T'} (T' - T) \frac{p^* - p}{s^* - s} s^* p^* dT'$$

For optimum  $p^*$  and  $p$ ,

$$GS^*/G^* = 0 \text{ we get; } p^* - p = s^* - s \cdot T/2 \dots (a) \text{ and}$$

$$/ (p = 0 \text{ we get; } p - p^* = s^* - s \cdot T/2 \dots (b)$$

Solving (a) and (b), we get the optimum  $p^*$  and  $p$  as:

$$p^* = s^* - s \cdot 2T/3 \text{ and } p = s^* - s \cdot T/3$$

Since;  $T \geq \underline{T}$  it is obvious that;  $p^* > 0$ , and also  $p > 0$ . It is also obvious that,

$$p^* > p \dots (5)$$

The profit as a function of quality is given as:

$$S_{s^*, s}^T = \frac{a}{4} s^* - s \cdot 2T - \frac{T^2}{9}, \text{ and}$$

$$S_{s^*, s}^{T'} = \frac{a}{4} s^* - s \cdot T - \frac{T^2}{9}$$

It is also observed that:

$$GS^*/G^* \geq 0 \text{ and } / (s = 0 \dots (6)$$

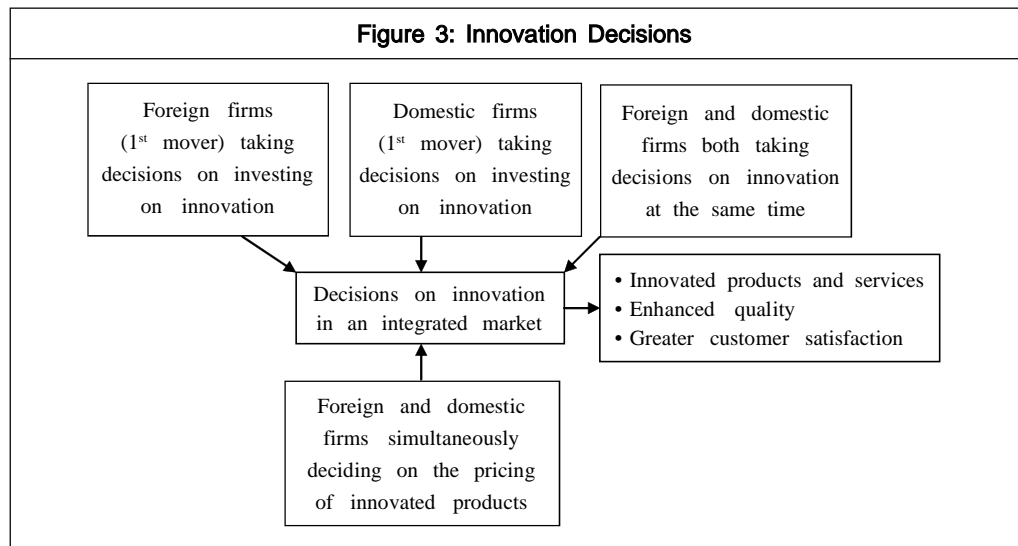
From equation (5) it is obvious that maximum product differentiation (vertical product differentiation) reduces price competition, as much as possible. Further, from equation (6)

it is clear that if the foreign firm invests on quality improvement (i.e. investment on R&D), it will generate more profit, but the reverse would happen in case of domestic firms.

### Innovation Decisions in Integrated Markets

It has been argued that, innovation has played a crucial role in organizations, by its contribution, in developing new ideas and then implementing the same through innovated/differentiated products and services in the marketplace. In an integrated market, which is characterized by multilateral trade liberalization, the competitiveness of a domestic firm (which is technologically inferior to the foreign competitor), would mainly depend on the degree of innovation achieved through R&D.

Let us now analyze the optimum quality choice of both the firms in the integrated market, in terms of game theoretic framework. The various game situation/stages, under which decisions on innovation could take place, is presented in Figure 3.



Now let ' $\hat{q}$ ' be the new achieved quality which could be obtained by investing in innovation. In the game as a whole, there exists multiple Sub-game Perfect Nash Equilibria (SPNE).

Let us now examine the two pure strategies SPNE:

(i) Let us suppose the strategy such that,

$$S^* = \{0, 1\} \quad S = \{0\} \quad \dots(7)$$

The post integration outcome involves, that the foreign firm is innovating alone.

(ii) Let us suppose the strategy such that,

$$S^* = \{1\} \quad S = \{0, 1\} \quad \dots(8)$$

In  $G_F$ , the post integration outcome involves, that both the firms are innovating.



## Gains from Market Integration

Pre-integration welfare of the foreign consumers is given as:

$$U^* - T s^* - p^* = 0 \text{ (as consumers reservation utility is only satisfied)}$$

Post integration welfare of the foreign consumers is given by:

$$U^* - T s^* - p^* - T s^* - s^* = s^2 T - T/3 - 1/3 T s^* - s - T s^* - s \neq 0$$

Hence in the post integrated market, the foreign consumers are getting more surplus than the pre-integrated market. Similar arguments could be given for the home consumers. It can be said that integration is obviously welfare improving for the consumers. There are, however, distributional implications. The firm also gains positive profit from integration, but quality improvement in the form of innovation, may or may not raise the profit of the firm (follows from equations (7) and (8)).

The benefits of market integration could be manifold in terms of:

- Ensuring better sharing and diversification of risks, and enabling the economic agents from one region to invest more easily in other regions.
- Enabling enhanced potential for greater and more substantial economic growth, as it could contribute to increase the economies of scale and scope, and thereby, increasing the investment opportunities.
- Fostering competition, cutting down costs and boosting innovation.

## Innovation Blues: The Shocking Truths in Indian Firms

Although theoretically innovation and domination by achieving market integration may seem to be very alluring, over the years, Indian firms had been held back from innovating and from thinking differently in order to move into a higher orbit. Narang and Malik et al. (2006) have identified the forces that discourage innovation in Indian firms, and they manifest themselves in the following ways, namely:

- **Attitude:** Most of the Indian firms do not dare to challenge the status quo, and think things differently on a wider perspective.
- **Low Satisfaction Threshold:** As most of the Indian firms are unable to radically change themselves, majority of them have adopted to a culture where, even the smallest positive change is boasted as a “breakthrough”. Innovation although achieved by Indian firms, is not being harnessed, on a long term basis.
- **Dilemma of Achieving 100% Solutions:** Most of the Indian corporations struggle with the dilemma of achieving 100% solutions to their day to day business problems, that actually holds them back from focusing on radical solutions achieved through innovation.
- **Business Focus:** Majority of the Indian corporations are preoccupied with their focus on the “present business needs”, rather than looking for the futuristic needs. As a result most

of the management mandates are short-term, which ultimately poses to be a serious hurdle to innovation.

- **Business Approach:** Most of the Indian organizations do not believe in the philosophy of empowering, and involving their frontline employees to share their innovative ideas with the management.
- **Approach to Innovation:** Indian firms hardly emphasize upon practicing a systematic approach towards innovation. It is where thinking around innovation needs to be broadened from a mere narrow focus, on either product innovation or process innovation, to a much wider span involving the entire ecosystem of the organization.

## Conclusion

Over the years, Indian companies had been prone to imitate the practices of their western counterparts in the quest for innovation. Innovation and creativity can best be nurtured in a permissive climate (Quinn, 1985). And it is where most of the Indian corporations has found it difficult to accept such a climate involving a continuing process of change. As a result, most of the initiatives had been rather sporadic, not systematic. Hence, in order to win in the near future, and particularly in a country like India, innovation has to be in the context of the nation's socioeconomic framework, and its economic imperatives. It has been made clear from this paper that firms, particularly the Indian corporations, should focus on enhancing their competitiveness, through long-term and continuous focus on innovation and emphasis on achieving market integration. Y

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