In microeconomics, the oldest theory is perfect competition and it is free from all kinds of exploitations whether it is consumer or producer. After perfect competition, the theory of monopoly came into existence, in which exploitation of consumer was highlighted. But later on other theories in literature that originated were monopolistic competition, oligopoly and duopoly that provided main insight into the subject. The microeconomics literature was associated with the capitalism system, which has undergone different phases as the time passed. Afterward the theory of firm came into existence, where new sets of code of conduct were highlighted along with Bains measures of barriers to entry. They became much popular among market oriented economists for enhancing the competition in each sector of the economy. The system of capitalism is bound for monopolistic tendencies and new name for this system is ‘crony capitalism’, which is quite popular in these days. Promotion of competition in the market is more beneficial from the consumer point of view. The healthy completion will bring new investment from new players; intense competition will promote more expenditure on research & development. This further help in cutting-edge technology that will reduce cost or improve the qualities of the products. With this the companies will be able to retain its profitability for longer period. It will further perpetuate more investment or new entry in the industry.

Indian industrial sector had been sheltered by protection through tariffs, quantitative restrictions, industrial licensing etc. The entry into manufacturing sector was merely governed by non-market forces during the ‘license raj’ and it was issued to specific groups. Industrial policies initiated during 1980’s brought about overhauling of industrial and trade policies bringing in changes in the form of reduced barriers to entry and promotion of competition. The process of change was initiated in early
1980’s but the changes were brought slowly into the system by late 1980’s. The licensing procedure was streamlined and the time frame of issuing of license was reduced. By 1981-82 the manufacturing equipment of exploitation of alternative sources of energy was de-licensed. In 1983-84, nine industries were exempted from provisions of section 21 and section 22 of the MRTP act. The major changes implemented were in form of capacity expansion, exemption from MRTP clearance in backward regions with high priority industries. By March 1985, 25 categories of industries were de-licensed. By late 1985, de-licensing was extended to 82 categories and the industries like drug and drug formulation were brought into list.

For industries yet to be de-licensed, broad banding was extended in stages and by January 1986, it covered some 28 industry groups which increased to 40 by 1988-89. Moreover, the asset threshold bringing a unit under the purview of the MRTP act, which was set at Rs 20 crore in 1969 was raised to Rs 100 crore in March 1985. In addition to a general policy thrust, important policy measures were undertaken in some key sectors of the industry. In September 1986, de-licensing was extended to certain chemical industries. The industrial policy reforms in late 1980s emphasized the need to ease entry or expansion of incumbent firms and recognised the importance of efficient scales of production. The policy of minimum economic capacity was ushered in to prevent fragmentation of capacity and reduce cost inefficiency. By 1988-89, minimum economic capacity was prescribed for 84 industries, which went up to 108 by 1989-90. However, the main thrust to the reforms in the industrial sector came with the announcement of the New Industrial Policy (NIP) in July 1991. The new policy package initiatives removed industrial licensing in all industries except those reserved for the public sector, for the SSI sector and those under compulsory licensing, subject to minimal locational conditions. Restrictions on investment by MRTP and FERA companies were also removed. The most important aspects of this policy package are: (i) Across the board de-licensing and the proposed repealing of the MRTP act, expected to reduce barriers to entry into the Indian industrial sector,( ii) A broader attitude towards foreign collaborations, technical as well as financial and especially the open door policy towards FDI, (iii) policies aimed at reforming the public sector.
These policies were supposed to play a major role in fostering the right market environment to increase competition and reduce barriers to entry. However, some [e.g., Mani 1992, 1995] feel that the New Industrial Policy (NIP) is still to go a long way in fulfilling the above-mentioned objectives - which only time can tell - especially given the fact that industrial production in the recent past suffered due to import compression, rise in the cost of imports, the BOP crisis, the uncertain atmosphere on investment due to the events in 1992 and 1993.

Entry plays a crucial role in the ‘Theory of Firm’ and has aroused extensive interest in Industrial Economics. Entry not only helps to decrease monopoly power of incumbent firms, it helps in reducing prices, eliminates excess profit, helps in decreasing inefficiency, stimulates innovations and technical progress. Entry, which is guided by factors like market structure, profit possibilities, performance and behaviour of incumbents, prevailing economy conditions, and government policies has always aroused interest of policy makers. The study of entry offers a deep insight into the working of market forces. Not only the market forces but also exogenous transitory factors such as policies of industrial regulation, state of economy, capital market etc. determine the entry to a larger extent. Keeping in view the changes in the Indian policy framework during 1980s and the NIP of 1991 – aimed at reducing barriers to entry and promoting competition, the in the Indian Manufacturing sector with the following specific objectives: study intends to analyze the extent and barriers to entry – we intend to achieve the following main objectives:

1. To discuss various theoretical issues relating to entry barriers.

2. To explain inter-industry differences in entry patterns in Indian manufacturing sector.

3. To identify and estimate various barriers to entry in Indian manufacturing sector.

4. To distinguish between the impact of various causal factors on the incidence vis-à-vis extent of entry.
5. To suggest various policy measures to enhance competitiveness in manufacturing sector.

**Review of Literature**

To fulfill the objectives of the study a comprehensive review of literature was essential. Various studies on the topic of barrier to entry have been reviewed.

**Orr Dale (1974)** analyzed of the determinants of entry across the Canadian manufacturing industries and derived several conclusions, most of which were consistent with a priori expectations. Capital requirements, advertising intensity, and high concentration were significant barriers to entry. Industry size consistently had a positive impact on entry. Research and development intensity and risk were modest barriers to entry, while past profit rates and past industry growth rate had a positive but weak impact on entry. These conclusions remained in spite of alternative definitions of the variables and sample. Barriers to entry permit higher profits, and a given increase in profit rates attracts fewer entrants in a high barrier than a low barrier industry. A difference between observed and entry limiting profit rates attracts fewer entrants in a high barrier than a low barrier industry. One of the important features of this study is the introduction of the entry variable. This permits conclusions regarding the determinants of entry that do not rely as heavily on measured profit rates as previous studies. Consistent with others, this study finds advertising and profitability highly positively correlated across the consumer goods industries. By regressing entry, rather than profits, on entry barriers this study reveals that at least part of the reason for this positive correlation is the negative impact of advertising on entry.

**Dixit (1981)** discussed the use of investment as an entry barrier. This materializes when capital expenditures once made, become irreversible or 'sunk' in the next period. Sunk expenditure lowers the incumbent's marginal cost for any output below the full capacity level, which, in turn discourages the firm from cutting output in response to entry. Dixit also shows that potential entry may encourage an incumbent firm to invest more in irreversible capital which has the effect of increasing the incumbent's post
entry equilibrium output. Sunk costs are a barrier that permits the incumbents to act strategically and forces the entrant to operate at a large scale in order to make profits. Capital investment can be an effective entry deterrent in the above model even if the potential entrant has the same cost function as the incumbent or even if the entrant has lower cost. The established firm’s technology with its sunk capital cost is a mechanism by which the firm can sustain the aggressive market share.

**Schmalensee Richard (1981)** emphasized the notion that large scale entry can create a discrete difference between pre entry and post entry price and profit levels, but the details of Bain's argument are still somewhat controversial. In assessing the importance of the scale economies barrier, Bain introduced the limit-pricing model of entry deterrence, in which established firms act as a perfect cartel and potential entrants expect those firms to maintain their pre entry levels of output even after entry. But the study further says that Bain's study has been subject to strong criticism by Stigler and Richard, because it may not be rational for the established firms to keep output constant after large scale entry has occurred. The study indicates that the basic point that emerges is that established firms, assuming they can coordinate their actions, have the advantage of being able to make some irreversible decisions before new entry appears. The established firms may still be able profitably to deter entry if they can commit to a level of capacity before potential entrant appears.

**Tripty Saikia (1997)** conducted an extensive as well as empirical study on Indian manufacturing sector on the issue of determinants of entry. The study was full of theoretical and empirical work. Saikia highlighted the changing scenario of Indian economy since independence on industrial front. The study proved that factors like profits, industry size and market growth attract entrants while entry is deterred in a concentrated and machinery intensive industry.

**Pindyck S. Robert (2009)** in his research proved that the barriers to entry are a fundamental determinant of market structure and play a central role in merger analysis and other antitrust settings. Barriers to entry can arise from a variety of sources, but if entry requires large sunk costs, the risks associated with post-entry profits can be
particularly important. In merger analysis and other antitrust settings, risk is often cited as a potential barrier to entry. Study is based on dynamic model of entry and industry evolution. The results suggest that in antitrust settings, the extent and nature of market-wide risk and the risk of failure should be of central concern. It is common in antitrust analysis to focus on how risk affects firms’ cost of capital, but this is very misleading. Study shows that the risk might have no effect on the cost of capital but can still act as an entry barrier.

The empirical literature throws some light on the various factors that affect the entry phenomenon and presents considerable evidence on the extent and barriers to entry across markets in a number of countries. Empirical work on entry has made significant contributions in the direction of recognizing the long run tendencies of entry and its associations with various elements of market structure in cross-sections of industries [e.g., Gorecki 1976; Hilke 1984; Kessides 1986; Baldwin and Gorecki 1987; Highfied and Smiley 1987; Schwalbach 1987; Shapiro and Khemani 1987]. More recent empirical studies have broadened this traditional work to include some dynamic aspects of entry through the use of longitudinal and panel data [e.g., Masson and Shaanan 1986; Highfied and Smiley 1987; Lieberman 1987; Dunne et al. 1988; Geroski 1988]. In spite of the flurry of empirical research accompanied by interesting results on the international front, it is surprising to note that nothing substantial has been done to study entry and its barriers in India.

Even though the review of literature is quiet exhaustive in nature but certain gaps in empirical as well as theoretical grounds are still prevalent. The present study tries to cover some of the research gaps pertaining to empirical work on barriers to entry in Indian manufacturing sector.

**Data Base and Research Methodology**

Present study is an investigation of barriers to entry in Indian manufacturing sector. Structured data on entry of firms' for each industry is not readily available in India. Consequently, for our research purposes various reports on Industry Financial
Aggregates & Ratios published by the Centre for Monitoring Indian Economy (CMIE) have been utilized to derive various measures of entry. These reports of CMIE have also been used for the measurement of the independent variables at the industry level. Data has been collected for the period 1990 to 2005 at the industry level. CMIE classifies industry into four major groups: manufacturing, services, mining and electricity. This research focuses on the analysis of entry barriers related to the manufacturing sector. So, we have taken the data on manufacturing sector as per the classification of manufacturing sector by CMIE. The manufacturing sector as per CMIE comprises of 17 major industry groups and further classified into 98 sub-groups. Data for the 98 industry sub-groups have been collected for the period 1990 to 2005. These have been used for the measurement of independent variables. The study was conducted for a period of twelve years (1993-2005) and across 98 industry sub-groups in the manufacturing sector in India. So we have 1176 (98 industries x 12 years) data points. Panel data has been used for the econometric estimation.

As discussed, the set of industry level determinants explored in our analysis include: concentration ratio (CR), size (SIZE), minimum efficient scale (MES), capital intensity (CI), advertising intensity (AI), marketing and distribution intensity (DMI), export intensity (EI), return on capital employed (ROCE), industry risk (IR), vertical integration (VI) and growth (GR). All these are measured at the industry level.

The model to explore barriers to entry builds on the broad factors identified by studies using the S-C-P framework. To facilitate discussion, the explanatory variables have been categorized into three groups: Structure, Conduct and Performance related factors.
Overall, therefore, we have two basic models as:

\[
\text{Number of entrants} = F [S (CR, SIZE, MES, CI, VI), C (AI, DMI, EI), \\
P (ROCE, IR, GR)]
\]

\[
\text{Incidence of entry} = F [S (CR, SIZE, MES, CI, VI), C (AI, DMI, EI), \\
P (ROCE, IR, GR)]
\]

Incidence value is 1 for a specific year if entry has occurred in an industry, else it is 0. The number of entrants is the sum total of all the entries in an industry group in a specific year. The Probit model is used to estimate the "incidence" version of the model while pooled regression and Tobit models are used to estimate the model on the "extent" of entry.

The result of the pooled regression, tobit and probit models provided us with the direction of relationship between 'entry' and the various explanatory variables.

Explanatory variables are measured by using different statistical methods like Herfindhal Index for finding concentration ratio of industries, exponential growth models for finding growth rates etc. However, other simple statistical tools like tabular analysis, ratios, percentages, frequency distributions etc. have also been used to reach conclusions. The findings of the study are summarized as below:

**Industry Wise Analysis of Manufacturing Sector in India**

The study presents industry wise analysis of manufacturing sector in India. The industries like food and beverages, cotton and synthetic textiles, cement, ferrous metals, paper & paper products, rubber & rubber products etc. have been considered for detailed study since 1993 to 2005.

As for as food & beverage industry is concerned, India is the world's second largest producer of food next to China, and has the potential of being the biggest with the food and agricultural sector. In the food and beverages industry, 363 firms were
operating in 1993-94 and the number of firms shots to 704 in 2000-01. The largest number of firms entered in the industry was 138 in 1994-95. Textile industry constitutes cotton textile, synthetic textile and other textile. India is one of the largest cotton producers in the world but has played a minor role in the world cotton trade. Following China and the United States (US), India is the third largest cotton producer in the world, with 25 percent of the world cotton acreage but only 13 percent of the world cotton output. Government policies over the years have shaped India's textile industry as a predominantly domestic-oriented industry. This is the sector where largest labor force of the country is engaged after agriculture. In 1993-94, 249 companies were operating under cotton textile industry, where as largest number of firms extended in the same year (39 times). The number of firms increased to 313 in 1996-97 and then decreased to 247 in the end of 2004-04. Chemical Industry is one of the oldest industries in India, which contributes significantly towards industrial and economic growth of the nation. The Indian Chemical Industry forms the backbone of the industrial and agricultural development of India and provides building blocks for downstream industries. The total number of firms was 687 in 1993-94 and number of firms increased at highest level to 1083 in 2000-01. Cement Industry in India is on a roll at the moment. Driven by a booming real estate sector, global demand and increased activity in infrastructure development such as state and national highways, the cement industry has witnessed tremendous growth. In 1993-94, 57 firms were operating in the cement industry and its total strength increased to 72 in 1994-95 with the entrance of 15 new firms. There were 21 firms that were operating in the petroleum industry, which rose to 29 in 1994-95 and in 2004-05 their number was 36. India has a huge rubber industry and million of opportunities to explore. Indian rubber products manufacturers have transformed the country in to a leading supplier and rubber products exporters. There were total 35 firms operating in the rubber products industry and 15 more joined the industry in 1993-94. The total number of firms rose to 54 in 1996-97 and it was declined to 46 in 2004-05. Similarly, a fluctuating trend has been found in other industries.
From the above discussion it has clearly emerged that the large number of firms, which entered in the Indian manufacturing sector was immediately after the period of liberalization. The large number of firms entered in 1993-94, 1994-95 and 1995-96 periods but afterward their number declined consistently. Chemical industry witnessed largest number of entry i.e. 529 entries during this period (1993-96). This was due to 100 percent FDI permissible in the sector and de-licensing initiative taken by the Indian Government in new industrial policy. The second largest number of firms entered in food and beverages industry and their number was 342. This was because of number of progressive measures taken by Government of India to set up and modernize food processing units like automatic approvals for foreign investment up to 100 percent (except in few cases), technology transfer, zero import duty on capital goods and raw material for 100 per cent export-oriented units. Custom duty on packaging machines was reduced. Central excise duty on meat, poultry and fish reduced to 8 percent, income tax rebate was allowed for new industries in fruits and vegetables besides institutional and credit support. The ferrous metals industry witnessed 257 new entrants in this period. The New Industrial Policy has opened up the iron and steel sector for private investment by removing it from the list of industries reserved for public sector and exempting it from compulsory licensing. Imports of foreign technology as well as foreign direct investment are freely permitted up to certain limits under an automatic route. Ministry of Steel plays the role of facilitator, providing broad directions and assistance to new and existing steel plants, in the liberalized scenario. The rubber & rubber products industry observed the second least entrants in the industry with 24 entrants. The petroleum products industry received only 10 entries in this period. Lesser entry in this sector may be because the sector is largely still reserved for the public sector, high tax rates and lower subsidies given by Government.

**Barriers to Entry- Empirical Investigation**

The results of the models specified above have been discussed here. The discussion is broadly divided into three parts. We begin with an analysis of pooled regression and tobit estimates on the barriers to 'extent' of entry. It will be followed by an analysis of
probit estimates on the barriers to 'incidence' of entry. Finally it has been analyzed if the barriers to entry are different for 'incidence' and 'extent' of entry.

**Model of Extent of Entry: Pooled Regression & Tobit Model**

Pooled regression model results show that both industry size and return on capital employed are statistically significant. Among the barriers to entry variables like minimum efficient scale, capital intensity and distribution and marketing intensity turned out to be statistically significant. The results show that minimum efficient scale, capital intensity and distribution and marketing intensity reduce entry significantly. Concentration, advertisement intensity, industry risk, vertical integration and export intensity does not come out to be significant though concentration, industry risk and vertical integration show the negative relationship with the entry.

The results for the tobit model suggest that large industry size and high returns on capital induce entry significantly. Minimum efficient scale (large scale of operation), capital intensity, concentration and vertical integration raise barriers to entry. All these factors can be called structural factors i.e. large scale of operations, capital intensity, concentration and vertical integration.

Results of the models of extent of entry shows that industry size turned out to be significant entry inducing factor in both pooled regression as well as tobit model (censored regression). Similarly, return on capital is also statistically significant entry encouraging factor in both the models. A comparison of both the models shows that industry size is the key entry inducing factor followed by return on capital. The estimates show that minimum efficient scale and capital intensity raise barriers to entry significantly in both the models. The results highlight that minimum efficient scale turned out to be the key barrier to entry followed by capital intensity in both the models. Distribution and marketing intensity comes out to be the significant entry barrier in pooled regression. Similarly, industry concentration and vertical integration deter entry significantly in tobit model.
Models of Incidence of Entry: PROBIT Estimates

The estimated results of the probit model show that large size of the industry and high returns on capital induce incidence of entry significantly. Vertical integration, export orientation, concentration and capital intensity raise barriers to entry significantly.

Overall most of the results are plausible. The results highlight that industry size and returns on capital increase the probability of entry significantly and vertical integration, export orientation, concentration and capital intensity have a significant effect on the incidence of entry and reduce the possibility of entry. Some of the new entrants may be well endowed leading to overcoming the entry barrier. For example minimum efficient scale, which has no significant effect on incidence of entry, may be because some of the new entrants are well endowed and are able to overcome the barrier. A few other variables that were expected to act as barriers to entry have a negative relationship with different types of entry although the relationship is not statistically significant.

Barriers to Extent and Incidence of Entry: A Comparative Analysis

Since estimates based on PROBIT and TOBIT models are not comparable, we can only compare the significance and direction of the relationship.

Structural Factors

The estimates suggest that large size of the industry increases the probability (incidence) of entry and also has a significant positive impact on the extent of entry, also it detered While industry concentration adversely affected the extent of entry and also it deters the probability of entry. High levels of vertical integration significantly reduced the extent of entry as well as incidence of entry. Overall, it emerges from the comparison, that most structural barriers to entry are relevant for both the extent (number of entrants) of entry and for the incidence (probability) of entry. High capital intensity significantly reduced extent of entry as well as it adversely affected the probability of entry.
Conduct Related Factors

Advertising intensity can facilitate entry through information provision about new players and products or deter it through brand loyalty, scale economies in advertising and so on. Advertising intensity did not influence extent of entry in a significant manner, although its coefficient was negative. The probit estimates also show that the relationship between incidence of entry and advertising intensity is negative though insignificant in case of entry. The case of distribution and marketing intensity is somewhat different. It does not have any significant influence on the extent and incidence of entry. Export orientation significantly reduced probability of entry and has a negative impact on probability of entry. Similar relationship hold in case of extent of entry, but it is not significant.

Overall, we can analyze that except export orientation, all other factors are insignificant both in case of incidence of entry as well as extent of entry.

Performance Related Factors

It is observed that high returns on capital employed induced the probability (incidence) and extent of entry. It has significant largest positive impact on probability of entry. Similarly, the impact is positive and significant in case of extent of entry. Growth of industry also increases the incidence and extent of entry but our estimates show that industry growth is insignificant both in case of incidence of entry as well as extent of entry.

Some Concluding Observations

Entry involves capital investments and risks related to it. This is so whether investments are for building a plant, brands or distribution channels to penetrate new markets. Efficient capital markets enhance availability of capital, reduce costs of capital and do not discriminate across players and helps in lowering the barriers to entry and build up the platform for a competitive environment. A variety of structural and strategic determinants have been explored in this study.
Policy Implications

Entry is an investment decision and efficiencies of the capital market play a major role in facilitating the process. The goal of a policy maker should be to ensure availability of capital, lower capital costs and create an efficient system of project evaluation that is in short, an efficient capital market. The inefficiencies in our capital markets result in a slack in competitive environment as the whole process of entry requires capital and that is what it is starved off. If the manufacturing industry continues to be plagued by capital availability constraints and related imperfections, competition with global standards and efficient cost structures may not be achieved. The results of the study show that these constraints can adversely influence entry in a variety of ways and therefore should be a major policy focus to enhance contestability in Indian manufacturing markets.

The second aspect of the policy makers need to look at is more of a 'policing' role in the competition policy. It has been discussed in literature that large domestic firms and MNCs have the tendency of controlling the market. Industries where such activities are predominant globally are consumer goods industries, certain basic goods like cement and in some cases services sectors like banks. Overall, the government should carefully follow the industry 'concentration' characteristics in order to avoid anti-competitive practices. If certain firms strategically build vertical integration to make non-vertically integrated firms at a cost disadvantage and gains control over the market, the government needs to take strict pro-competitive policy actions in such cases and the role of competition commission of India should be enhanced and empowered to create market oriented cum healthy competition.

Moreover, a continued focus on conduct through competition policy is desirable. Entry barriers may not be "high" enough to deter entry; they often adversely affect post entry performance and can result in exit of "new" firms. Thus, as Geroski (1995) said, entry can be a poor substitute for active rivalry among incumbents in market and the policy needs to maintain an active focus on that.
Lastly growth oriented policies will result in higher extent/incidence of entry. This will create dynamism in the economy and also a competitive environment. One can argue that lower capital costs that induce new investments may also enhance the growth prospects.

**Issues for Further Research**

Having identified the gaps in this research, following it up specifically on the entry classification front - foreign and domestic ownership, mergers and acquisitions will enrich the scope of the study. Similarly by incorporating the data on import competition and capacity utilization one can control on two important aspects of strategic behavior of firms. Another important aspect of extending this research can be to incorporate the role of firm specific factors in deterring entry. Given the industry characteristics, in which entry is taking place, additional firm level information will help in identifying the variables that influence entry. Thus, in this conceptualization entry will depend on two sets of variables - firm specific and industry specific characteristics. Such an exercise will give valuable inputs for firm level strategies.