FOREIGN DIRECT INVESTMENT AND MARKET STRUCTURE: EVIDENCE FROM INDIA'S MANUFACTURING SECTOR

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I hereby affirm that the work for this dissertation, ***"Foreign Direct Investment and Market Structure: Evidence from India's Manufacturing Sector"****, being submitted as a part of the requirements of the M.Phil Programme in Applied Economics of the Jawaharlal Nehru University, was carried out entirely by myself. I also affirm that it was not part of any other programme of study and has not been submitted to any other University for the award of any Degree.*

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Certified that this study is the bona fide work of **Jatinder Singh,** carried out under our supervision at the Centre for Development Studies.

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AFFECTIONATELY DEDICATED
TO
MY PARENTS AND MAMA JI (R. S. GHUMAN)

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Abstract

The concept of market concentration has been widely discussed in the literature on industrial organization. Evidence suggests that market concentration has implications on the long run growth path of an economy through its effect on the allocation of economic resources among various economic activities including innovation. In the changing scenario at global level, most of the developing economies have resorted to liberalization (with regard to their trade and investment policy) since the late seventies inter-alia with the objective to develop competitive industrial base in the economy. The champions of liberalization argue that the free movement of factors of production across nations under liberalization will allocate resources in such a manner that every individual or economy will achieve 'Pareto Optimal' situation. In tune with the global trends, and with a view to develop a competitive and efficient industrial structure the government of India also announced series of liberalization measures in mid-1980 and early 1990. Despite these policy reforms, the manufacturing sector in the country is found lagging behind in terms of its share in GDP and growth rate. As per the report of National Manufacturing Competitiveness Council (2007), the fundamental cause of the poor performance of manufacturing sector is the inability of the country to build and maintain competitiveness needed to meet the globalization challenges. Scholars argue that the liberalized investment policy regime may crowd out the domestic investment in the absence of strong competitive base of domestic industries and lead to market concentration. In this context, the present study broadly tries to analyze the impact of Foreign Direct Investment (FDI) on market concentration with special reference to India's manufacturing industries during the post reform period. The specific objectives of the study are as follows: first, to understand the emerging trends in market structure in Indian manufacturing sector against the backdrop of liberalized trade and investment policies; and second, to analyze the influence of foreign direct investment on market structure in the manufacturing sector. The study utilized various secondary data sources (CMIE industry, market size and share, CMIE PROWESS) and appropriate econometric methods to fulfill the aforesaid objectives. The empirical analysis tends to suggest that market concentration in general is showing an increasing trend. Detailed exploration of the trends in concentration across different industries with varying levels of technology further confirmed this finding (concentration has increased). The estimates of panel regression model to examine determinants of market concentration indicated a positive and significant impact of FDI on the market concentration. If the result of the study is any indication, the increased inflow of FDI is likely to make the industry more concentrated and would have its adverse effect on the policy objective to reduce industrial concentration through liberalization measures.

Key Words: FDI, Market Structure, Economic Reforms, Concentration.

CONTENTS

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Abbreviations

CMIE	Centre for Monetary Indian Economy
CR	Concentration Ratio
FDI	Foreign Direct Investment
FERA	Foreign Exchange Regulatory Act
GDP	Gross Domestic Product
GFCF	Gross Domestic Capital Formation
HHI	Herfindahl-Hirschman Index
IO	Industrial Organization
ISIC	International Standard Industrial Classification
LC	Level of Concentration
MNCs	Multinational Corporations
MRTP	Monopolies and Restrictive Trade Practices
OCB	Overseas Corporate Bodies
OECD	Organization for Economic Cooperation and Development
SIA	Secretariat for Industrial Assistance
TNCs	Transnational Corporations
TV	Television
UNCTAD	United Nations Conference on Trade and Development
WIR	World Investment Report

CHAPTER I

INTRODUCTION

1.1 Context of the Study

Industrial concentration and the various issues associated with it have long been an area of research that attracted the attention of scholars both theoretically and empirically (Ghosh, 1975; Pillai, 1978; Siddharthan, 1981; Curry and George, 1983; Kambhampati, 1996; Joseph, 1997; Subramanian, 2005). Concentration is often seen as a deviation from competition. This deviation has been a matter of concern because industrial concentration has serious implications on long term growth of the economy and on consumer welfare. Concentration is also closely associated with the issue of economic efficiency in the industrial market structure[1]. The increase in concentration and the resultant collusion could affect efficiency by widening the gap between price and marginal cost of production and further inducing firms to spend resources inefficiently in order to maintain their market position (Baer and Mote, 1985; Strickland and Weiss, 1976). In addition, the firms' innovative behavior conditioned by the industrial market structure continues to be a controversial issue in the literature (Lundin et al., 2007; Subramanian, 1971, 2005; Aghion et al., 2002; Aghion and Howitt, 1992).

Literature in the Indian context on industrial concentration has identified several factors that determined industrial market concentration. The most important factors having bearing on industrial concentration included, but not limited to, scale economies, market size, growth of the industry, capital intensity, marketing intensity, etc. (see, Ghosh, 1975; Pillai, 1978; Kambhampati, 1996, 1998; Athreye and Kapur, 2001, 2006; Basant and Saha, 2005; Beena, 2006). Importantly, state policies were playing decisive role in determining the industrial structure during pre-reform period[2]. Most of the activities in manufacturing sector were subject to licensing policies and rigid capacity controls. Moreover, the supply of essential inputs and prices of final

[1] See Baker, 1992.

[2] State intervention occurs at two levels in India: direct production by public sectors and regulation of private sector by state (see Kambhampati, 1996).

products were administratively determined. Above all, the entry of foreign firms was discretionary and highly restrictive till eighties (Subramanian et al., 1996). Consequently, these policy restrictions played a vital role in determining the seller market concentration.

During the last couple of decades, the industrial structure in most developing economies has been subjected to substantial changes on account of the market oriented policy reforms. Following the bandwagon, government of India also undertook a series of liberalized policy initiatives that began in the early 1980s and culminated in the 1990s with the initiation of reform measures that left hardly any sector untouched. The 'New Economic Policy' in July 1991 showed a sign of paradigm shift from centralized planning and regulatory regime towards market orientated liberalization, privatization and globalization. The major policy shifts included the removal of licensing policy, restrictions on FDI, Monopolies and Restrictive Trade Practices (MRTP) Act of 1969, among others. All these policy reforms, especially the reforms in trade and investment aimed at making the industrial structure more competitive. These liberalization measures, among others, facilitated the entry of foreign investment through MNCs at an unprecedented rate which increased from US$0.08 billion in 1991 to about US$19 billion in 2006-07[3] (UNCTAD, 2007; Bajpai and Dashgupta, 2004). Further, FDI inflows into the manufacturing sector also increased from US$ 2.76 billion in 2001-02 to US$ 3.11 billion in 2006-07[4] (SIA, Newsletter, 2006). In a context wherein number of studies established the bearing of FDI on market structure (UNCTAD, 1997; Lall, 1979; Lundin, 2007), the key question pertains to the empirical evidence on the influence of FDI on market structure in India. While this is an issue of immense policy relevance, our understanding on this issue is rather rudimentary. Hence, the present study is an

[3] The definition of FDI has undergone various changes in the recent period to make FDI comparable at international levels. Till 2001-02, foreign equity was considered as FDI. Since 2001-02 FDI includes foreign equity, re-investment earning, and other capital (RBI, Handbook of Statistics on Indian Economy, 2006-07).

[4] Data on annual FDI inflows in manufacturing sector is available from 2001-02 onward with SIA and other authentic sources of data on FDI.

attempt to examine the role of FDI in determining the market structure in India's manufacturing sector[5].

1.2 Foreign Direct Investment and Industrial Market Structure: Experience of other Countries

Literature on the subject of FDI and market structure is very rich with empirical studies in case of different developed and developing countries. But, there is no clear consensus on the direction of competition with the entry of multinational firms.

There is a set of empirical literature on the entry of MNCs, which made out the strong case for FDI by showing the evidence that the entry of MNCs reduced market concentration and improved competition in the host country industrial market structure. The study by Kindleberger (1969) has shown that the entry of MNCs transformed host country market structure into competitive market. This is so because the MNCs are globally competitive firms and possess huge resources (both tangible and intangible), which enabled them to compete effectively with the producers in the host country. Thus the entry of MNCs into the domestic economy reduced monopoly power of local producers. Similarly Cho (1990) tested the impact of FDI on banking market structure in Indonesia during 1974 to 1983. The evidence supported the view that the foreign presence reduced market concentration. Furthermore, the study claimed that foreign entry reduced market concentration especially where entry barriers were generated by domestic firms to the small domestic firms[6]. In the same line, Geroski (1995) and Driffield (2001) examined the impact that foreign direct investment on industry concentration in UK's manufacturing sector. This paper used regression analysis by taking concentration as a dependent variable and FDI along with other control variables. Study indicated that the entry of MNCs promoted more competition in the host country market structure. Similarly, a study in Chinese context also visualized that entry of MNCs reduced market concentration. This paper used firm-level data for manufacturing firms for the period 1998-2004. Empirical findings indicated the strong and robust negative impact of FDI on firms' price cost margin

[5] The importance of manufacturing sector is discussed in section 1.4 in present chapter.

[6] The MNCs have some advantages over the domestic firms the entry barriers by domestic firms do not make problem for foreign entrants.

(after controlling for efficiency). This suggested that FDI led to increase competition in Chinese manufacturing sector (Lundin et. al., 2007; Sun, 1998). Other studies, namely Braunerhjelmon et al. (1998); Markusen and Venables (1997); Petrochilos (1989) also showed that FDI dilute the market power of the local firms.

There is another set of empirical literature, which indicated that the entry of MNCs promoted market concentration in the host country. Lall (1978, 1979) studied the impact of MNCs on Malaysian manufacturing sector. Evidence suggested that high foreign presence is associated with high level of concentration. He argued that foreign presence increased concentration by introducing new process and other marketing strategies (predatory conduct, advertisement). Following scholar, namely Bourlakis (1987), also analyzed the influence of entry of MNCs on Greece manufacturing industries. The empirical evidence indicated that the presence of MNCs promoted market concentration in Greece. Study reported that the major barriers to entry operated in the form of capital intensity and the size in production. Foreign firms are in better position to raise funds, both from host country and outside the host country, due to their global production network. In this manner, the entry of foreign firms generated barriers to entry for potential entrants. Following the same path, the study by Yun (2001) addressed the issue of how FDI affected market structure in Korean manufacturing sector during 1991 to 1997. Using concentration ratio and regression techniques, study found that entry of FDI by MNCs positively contributed to industrial concentration and subsequently increased price cost margin. Study argued that the exclusive knowledge about production and marketing strategy of MNCs facilitated them to establish in new market and consequently promoted market concentration. Newfarmer (1978) also explored the positive association of FDI and industrial concentration in Brazilian electronic sections. Paper particularly noted that MNCs used predatory pricing strategy to get dominant position in the market. Following scholars namely Blomstrom (1986) found that MNC presence acted as an independent source of concentration in Mexico, and Willmore (1989) presented similar results for Brazil.

However, all above cited literature directly or indirectly suggested that MNCs possessed ownership advantages arising from exclusive knowledge about methods of production, access to limited inputs, patents, huge investment on sunk cost etc., which

provided them comparative advantages to perform better than their counterparts in the given host country. In this process, MNCs wipe out competition and consequently exacerbates market concentration.

The above discussion pointed out that the existing literature on the relation between entry of MNCs and the evolution of host country market structure was inconclusive. With this discussion, the next section will look into some empirical studies in Indian context on market concentration.

1.3 Literature in Indian Context

The relationship between FDI and market structure is very less studied in Indian context. It may be because FDI is getting importance only in the recent years and the data availability is the major problem. Most of the available literature in the Indian context emphasized the impact of economic reform on industrial structure and further the mark-up behavior in relation to market concentration.

1.3.1 Industrial Concentration in Pre-Reform Period

The initial work on Industrial concentration was undertaken by Ghosh (1975). He examined the patterns of industrial concentration in India during 1948-1968. To capture industrial concentration, the study estimated 4-firm and 8-firm concentration ratio. It was observed that out of 22 industries only 4 industries showed upward trends of market concentration. Further, the growth of industries played a major role in declining trends of industrial concentration. In the same line, Kambhampati (1998) analyzed the market structure using the Structure-Conduct-Performance paradigm for the period 1974-85 and the study has observed the declining concentration using Herfindahl Index. The results indicated that minimum efficient scale (positive sign) and industry reserved for public sector (negative sign) are significant determinant of industrial concentration in Indian industries. Chand and Sen (1998) supported the findings of Kambhampati and showed that liberalization of trade regime reduced Price Cost Margins[7] during 1973-88. But, these studies focused on concentration during pre-reform period.

[7] Declining price cost margins indicate increasing competition.

1.3.2 Economic Reforms and Market Concentration in India

As it is well known, government of India introduced comprehensive market oriented reforms in mid-1980 and early nineties. The fundamental objective behind liberalization measures was to strengthen competition (or reduce concentration) in Indian industries. Under regulatory regime most of the industries developed inefficiency with a high cost structure resulting in low levels of international competitiveness.

Literature on market concentration in the context of economic reforms is as follows: Bhaskar (1992) analyzed the trends in industrial concentration in Indian manufacturing sector for the period 1978-79 to 1991-92. The study used tools like N-firm concentration ratio as a measure of market power. The study found that the share of the assets of the top twenty business houses in total private corporate sector assets remained more or less stable during 1970-1979 and increased thereafter. The study also reported that a marginal decline in the average three-firm concentration ratio with no reduction in the percentage of product concentration levels. Thus, the policy change in the first half of eighties did not affect the overall level of concentration and failed to promote the competition. The available evidence on concentration until 1990 showed that the concentration remained constant till early 1980s and increased subsequently. The increase in concentration coincided with the first phase of liberalization in the industrial sector. This suggested that the removal of restrictions in the industrial sector that enabled the big industrialist to further expand the market share (or power). In the same line, Joseph (1997) explored the impact of liberal policy regime on market structure and competitiveness during 1983 to 1995 in India's electronic industry. The study indicated that the outcome varied from one product to another. In case of computers it was found that the impact of policy changes has been a rapid increase in the number of firms in the industry. Study also reported that the entry of large number of new firms considerably reduced the degree of seller's concentration in the 1980s as compared to the 1970s. The concentration trends based on four-firm concentration ratio has declined from 0.86 in 1978-80 to 0.58 in 1988-89. With the further openness one would expect a less concentrated market structure in 1992-93. On the contrary, the observed result showed that the market concentration increased from 0.58 in 1988-89 to 0.66 in 1992-93.

Pant et al. (2005) used firm level data for the period of 1989 -2001 to study the impact of openness on competition in India's manufacturing sector. Paper used balance panel technique by taking mark-up as a dependent variable and openness, CR4, wages, FDI, industry dummy and time dummy as an explanatory variables. Further, the paper used Lerner price cost margin index as a measure of competition. The evidence indicated that almost all the industries showed higher mark-ups in the period of 1996 to 2001 as compared to 1989 to 1995. The study has shown that openness did not indicate any decline in industrial concentration, probably because unequal strength of market players. The study also reported the negative association between marks-up and foreign presence. Similarly, a recent study by Beena (2006) analyzed the role of merger and acquisition in the changing level of concentration in case of pharmaceutical industries for the period of 1992-93 to 2003-2004. Paper used simple OLS method; the findings indicated the positive association between increasing level of concentration and merger and acquisition in the given industry. Another study by Athreye and Kapur (2006) revealed the trends of industrial concentration in India's manufacturing sector for the period 1970 to 1999. The entire study period was divided in two phases namely, first phase (1970 to 1984) referred to as pre-reform period and second phase (1985 to 1999) referred to as post reform period. Evidence indicated that market structure was largely shaped by the state policy during pre-reform period, but industrial characteristics played a predominant role in determining the market structure during post reform period. Besides, the study inferred that concentration level declined in some industries in post reform period but increased in others. Study by Pushpangdan et al. (2008) also shown that concentration in Indian industries have increased during reform period.

1.4 Research Issues

Thus far, we discussed the available empirical literature in the Indian context as well as other countries on the issue at hand. The available literature suggested that the entry of FDI affected host country market structure, though the findings are inconclusive. Coming to Indian literature, most of the studies analyzed the concentration in closed economy context. As discussed in the introductory section, state policies have been playing a predominant role in determining the industrial

concentration. With liberalization the role of state policies appears to have reduced considerably.

Literature in context of liberalization seems to have not given adequate attention towards examining the impact of FDI on market concentration. Most of the studies analyzed the mark-up behavior, whether it increased or decreased (Pant et al., 2005; Pushpangadan et al., 2008). The study by Bhasker (1992) analyzed the impact of liberalization policies on industrial concentration. Study estimated 3-firm concentration ratio, but without any comprehensive model it is impossible to assess, whether the concentration increased due to liberalization (openness of trade and investment) or structural characteristics that are inherent to industry. Further, Athreye and Kapur (2006) also overlooked the role of FDI as a determinant of industrial market concentration; even though it is undertaken in a period wherein FDI increased substantially. With this apparent neglect in existing literature of the issue at hand in a context of unprecedented increase in the inflows of foreign investment into India during reform period (as discussed in the introductory part), it is an important to explore how has FDI impacted up on market structure.

1.4.1 Importance of Present Study

To reiterate, in the context of increasing inflow of FDI[8], it is essential to scrutinize the impact of FDI inflow in determining the market structure in Indian context during post-reform period[9]. It is important not only from the academic point of view but holds great implications for policy makers. In spite of the significance of the issue, there is hardly any empirical study in Indian context, which directly analyzed the impact of FDI on market structure during post reform period[10].

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[8] The FDI inflows towards Indian economy increased very sharply from 0.03 per cent of gross domestic product in 1990-91 to 1.7 per cent in 2006-07 (Golder et. al., 2007; Rajan et. al., 2008). As per UNCTAD (2007), India emerged as the second most important destination for foreign investment after China and ahead of US, Russia, Brazil and received US$19 billion FDI in 2006-07. The notable increase in FDI inflows is chiefly attributed to the liberal investment policies adopted by the country since 1991.

[9] The ultimate objective of FDI liberalization is to enhance economic growth and welfare in the country. Success depends not only on the increasing FDI inflows, but also ensuring the competitive industries and market where MNCs are operating (UNCTAD 1997).

[10] This may be because FDI inflows were very less in early years of economic reforms.

The scope of this study, given the data constraint, is limited to manufacturing sector. In-spite of impressive growth of the overall economy; the manufacturing sector did not maintain that tempo especially during reform period. On the whole, the manufacturing sector grew at an average of around 7 per cent during a twenty year period. The share of this sector in GDP has been stagnant around 17 per cent during reform period.[11]

As per the report of National Manufacturing Competitiveness Council (2007), the fundamental cause of the poor performance of manufacturing sector is the inability of the country to build and maintain competitiveness needed to meet the globalization challenges. Scholars[12] argued that the international competitiveness is very important in the context of on-going global integration between developed and developing nations. Internationally competitive enterprises could avail the opportunities provided by globalization.[13] In the absence of strong competitive base of domestic industries, the liberalization of trade and investment policy crowd-out the domestic investment and lead to market concentration (Huang, 2003).

In the context of poor competitive base and increasing trend in market concentration in Indian manufacturing[14] sector, the present study made an attempt to analyze the role of FDI in determining the market concentration during reform period.

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[11] For detail, see National Manufacturing Competitive Council report (2007), Page 7.

[12] See Kumar and Joseph, 2007.

[13] In an open economy, domestic market is not more constraint for the expansion of production capacity; international competitive enterprise can grow endlessly in the world market. At the same time, domestic market is not far granted for uncompetitive enterprises.

[14] See Bhaskar (1992); Joseph (1997); Pushpangadan et al., (2008); Pant et al., (2005).

1.5 Specific Objectives of the Study

The overall objective of the study is to examine the trends and pattern of FDI and market structure in manufacturing sector during reform period and the impact of FDI on market structure. More specifically, the objectives of the study are as follows:

- To understand the emerging trends in market structure in Indian manufacturing sector against the backdrop of liberalized trade and investment policies.
- To analyze the influence of FDI on market structure in the manufacturing sector.

1.6 Concepts, Methods and Data Sources

1.6.1 Concepts of Market Structure

The concept of competition (or concentration) has been a central to the analysis of market structure. Competition has always played an important role in deciding allocation efficiency, when wants are unlimited and resources are scarce to satisfy those wants. As per neo-classical view, the perfect competition is a state or type of market structure with absence of rivalry in the purest form. Absence of entry barriers, large number of buyers and sellers and homogeneous products lead to price taking behavior by the firms. In this type of market structure resources flows are determined by the market forces to achieve the 'Pareto Efficiency' situation. Any divergence from competitive market structure is an indication of increasing concentration, which gives birth to other types of market structure such as the monopoly, monopolistic and oligopoly market structure. Oligopoly market structure is an important form of imperfect competition.

Emphasizing on disequilibrium analysis, the Austrian tradition found the concept of perfect competition uneasy. The concept of competition, discussed by Neo-Classical school, describes an equilibrium situation and ignores the process, which leads to an equilibrium. According to Austrian school, the concept of perfect competition does not allow for changes in prices or product differentiation and other form of dynamic rivalry, which are prevalent in a dynamic economic system. This makes the model incapable of explaining the working of a capitalist system.

Other type of market structure is known as oligopoly. Oligopoly is characterized by a few sellers selling different products which are substitutes to each other. Certain degree of competition has been revealed by price war and strategic behavior of the firms. Absence of free entry as the existing players are enjoying minimum efficient scale, having sophisticated technology and made high sunk cost to establishing brand name in the market. Further, there is a possibility of emergence of tacit cartel among producers to maximize their profits instead of price war. The collusion/cartel among sellers automatically promotes inefficiency in production system. The other extreme of competitive market structure is monopoly. In perfect monopoly, only one seller is producing a product, he is in a position either to dictate the price or output level, thereby reap monopoly profits.

For present study, we tried to infer the extent of concentration by examining the observable level of market power and its changes over time. Market power will be captured through proper physical indicators such as sales share of a firm.

1.6.2 Concepts of Foreign Direct Investment

Foreign Direct Investment[15] (FDI) is defined as international investment made by a resident entity in one economy (direct investor) with the objective of establishing a lasting interest in an enterprise resident in an economy other than of the investor (direct investment enterprise). 'Lasting interest' implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the direct investor on the management of the direct investment enterprise. Direct investment involves both the initial transactions between the two entities and all subsequent capital transactions between them and among affiliated enterprises both incorporated and unincorporated (OECD Benchmark Definition of FDI, 1996).

According to IMF definitions a firm is treated as a foreign direct enterprise if 10 per cent of its voting stock is held abroad by a single investor.

[15] Types of FDI Greenfield investment: It is the direct investment in new facilities or the expansion of existing facilities. It is the principal mode of investing in developing countries. Mergers and Acquisition: It occurs when a transfer of existing assets from local firms takes place.

1.6.3 On Measuring Concentration

The choice of a specific index as a measure of market power is pre-requisite for statistical analysis. There are number of available indices based on some theoretical properties. Hannah and Key (1977) have listed a set of axioms that a concentration measure should fulfill: First, an increase in share of K^{th} firm, for all k ranking firms 1, 2, 3.....K...N in decreasing order of size, implies an increase in concentration. Second, principle of transfer should hold, that is, the concentration should increase if the share of any firm is increased at the expense of small firm. Third, the entry of new firms below some arbitrary significant size should reduce concentration. Fourth, mergers should increase concentration. Fifth, random brand switch by consumers should reduce concentration. Sixth, if Si is the share of new firm, then as it becomes progressively smaller so it should reflect in concentration index. Finally, random factors in the growth of firms should increase concentration.

There is a debate with regard to 4^{th} axiom. Hart (1975) argued that mergers can reduce concentration, when smaller or inefficient firms are merging with average size of firm, hence generating competition for dominant firms. But no concentration measures fulfilled all the axioms.

The commonly used measures of concentration are as follows: first, market share: it is defined as the sales share (s_i) of a particular firm to the total sales(s) of the industry. It gives the distribution of market share in an industry. But problem with this measure is that it failed to capture the product substitutability. If product is a substitute then efficient firms would get more shares. This measure just showed that industry has dominant firms. But if product is non-substitutable then the situation can emerge where inefficient firms can be the dominant firm. Both situations showed the existence of dominant firms in the industry with different implications.

Secondly, the other commonly used measure of concentration is price cost margin modified from Learner index of monopoly power. The price cost margin can be defined as price cost margin weighted by market share measured as $\sum s_i$ (y_i – Total Variable Cost) / y_i where $y_i = p_i q_i$, p_i is the price of i^{th} product; q_i is the quantity of i^{th} product; y_i is sales share of i^{th} firms in total sale of the industry. This index is widely used by researchers to measure the market power. The problem with this measure is

that this is highly affected with cyclical fluctuations (Boone et al., 2005). This index can under estimate the level of concentration in recessionary phase and over estimate in booming phase of the economy. This does not mean that the concentration level is changing.

Third, the other commonly used one is the degree of sellers' concentration, measured in terms of the N-Firm Concentration Ratio. It can be defined as the sales share of leading few firms to the total sales of the industry. It is popular because it is easy to compute and easy availability of data. The choice of N-firm is arbitrary. Generally, it varies from 3 to 8 firms. This index indicated the existence of dominant firms in the industry or in the market. The major limitation regarding this measure is that this measure does not tell any information of other firms ranked after N.

Fourth, another concentration measure is Herfindahl-Hirschman Index (HHI). This index is defined as the sum of square of all the firms in the industry, symbolically $\sum S_i^2$ where i = 1, 2, ..., n and S_i is the sales share of i^{th} firm in the particular industry or market. The advantage of this index is that it takes into account the share of all the firms in the market and explains the distribution of firms in the industry. This index is widely used in the literature to measure the market power. The HHI index is very sensitive to tail. Following these measures, fifth, there is a measure called turnover index. The turnover visualized the important dimensions of competition which cannot be captured by most concentration indices like concentration ratios. Suppose the n-firm concentration ratio did not change over time, but the identity of the firm in the leading firms can change because of competition. This can be captured by the turnover measure (Pushpangadan et al., 2006).

Sixth, literature used the rate of return to examine the market power of the firm. The rate of return can be defined as the earnings of the firms to the sum of working capital inventories and fixed capital or profits before tax to total capital employed (Stigler, 1963). This measure visualized that if the rate of return is very high, it means market is not a competitive market and vice versa. Literature explored the positive association between market power of the firms and profit rates. The use of any concentration measure for practical purposes depends upon the availability of data set.

1.6.4 Data Sources

To explore the aforesaid objectives, study needs reliable dataset on FDI (at country level, firm and industry levels). UNCTAD database and PROWESS electronic database (published by the Centre for Monitoring Indian Economy) are the authentic source of country wise and firm-wise FDI inflows, respectively. However, Secretariat for Industrial Assistance (SIA) is the major source of industry level FDI inflow.

On the measures of market structure, study requires product level data base. Product level database will provide exact level of market concentration. The measure of market concentration at firm or industry level may be misleading because one firm produces more than one product. In this process, the concentration in one product market may inflate the overall concentration level of the firm or industry or vice-versa. To avoid this under or overestimation in market concentration, the present study will use product level database provided by CMIE's publication titled 'Industry, Market Size and Shares'. Though, industrial associations provide the database, it is not very comprehensive and sometimes involves underestimation as all the firms are not members of the association. Notwithstanding, CMIE database have some problems in terms of coverage of specific products and regularity in relation to industrial associations' database, the CMIE data set is more reliable and comprehensive in terms of coverage. Given the data constraint, the present study intends to measure market concentration by using CMIE database on industry, market size and market shares. This data set will provide information at product level for some selected products in manufacturing industries. Using product level information, the study would trace the trends of market concentration during the liberalization period (1991-92 to 2006-07) in the Indian manufacturing sector.

Further, the study would investigate the relationship between the entry of MNCs and emerging market structure. To explore this relationship, we need reliable and comprehensive information about the equity share of foreign firms[16]. The data on foreign equity holding is available with PROWESS electronic data base published by CMIE. The information for equity holding is available at firm level since 2001. The

[16] The standard definition of foreign direct investment, a firm holding 10 percent or more foreign equity to total equity is considered as the foreign firm.

information on foreign direct investment at the industry level is available with the Secretariat for Industrial Approval.

1.6.5 Selection of Industries

The present study will analyze the trends and patterns of market concentration both in general (together for all the product)[17]and specific to industry. For this purpose, present study selected twelve industries for analysis (refer Table 1.1).

Table 1.1: Classifications of Manufacturing Industries Based on Technology Intensity (ISIC Rev. 3)

High-technology industries	Medium-high-technology industries	Medium-low-technology industries	Low-technology industries
Aircraft and spacecraft	Electrical machinery and apparatus, n.e.c.	Building and repairing of ships and boats	Manufacturing, n.e.c.; recycling
Pharmaceuticals	*Motor vehicles, trailers and semi-trailers*	*Rubber and plastics products*	*Wood, pulp, paper, paper products, printing and publishing*
Office, accounting and computing machinery	*Chemicals excluding pharmaceuticals*	Coke, refined petroleum products and nuclear fuel	*Food products, beverages and tobacco*
Radio, TV and communications equipment	*Railroad equipment and transport equipment, n.e.c.*	*Other non-metallic mineral products*	*Textiles, textile products, leather and footwear*
Medical, precision and optical instruments	*Machinery and equipment, n.e.c.*	*Basic metals and fabricated metal products*	

Source: OECD Science, Technology and Industry Scoreboard 2007.
Note: Industries name in Italic means that are selected for analysis.

The selection of industries is based on the maximum number of products available from CMIE industry, market size and share data base. Further, these industries are divided into four technology levels on the basis of OECD, 2007 (Classification of manufacturing industries based on technology intensity, ISIC, Revision 3). The logic

[17] Irrespective of a product belongs to the particular industry.

behind the division of industries on the basis of global technology levels is to test the relationship between market concentrations and different technology levels. Whether different technology levels have different influence on market structure?[18] The industries selected for analysis are as following: office, accounting and computing machinery; radio, TV and communications equipment; and medical, precision and optical instruments from high-technology industries; motor vehicles, trailers and semi-trailers including railroad equipment and transport equipment, n.e.c[19].; chemicals excluding pharmaceuticals; and machinery and equipment n.e.c. from medium-high-technology; rubber and plastics products; other non-metallic mineral products and basic metals and fabricated metal products from medium-low-technology industries; wood, pulp, paper, paper products, printing and publishing; food products, beverages and tobacco; and textiles, textile products, leather and footwear from low-technology industries. Table 1.1 showed the OECD manufacturing industries classification.

The disaggregated picture would produce product market concentration in particular industry. It will help to compare the level of concentration with the level of technology. Does changing of technology levels affect market concentration differently? Given the data set and broader methodology overview, the specific methodology is discussed in respective chapter.

1.6.6 Limitations of the Database

The data set available and made use of it in the current study has some limitations. These limitations are to be kept in mind while drawing inference from our analysis. The major gaps in CMIE industry, market size and share are as follows: Firstly, CMIE market share database is a sample dataset; it is not providing information for all the firms producing a product. Secondly, the coverage of firms varies across the years. Information on some products was available for some years and it was missing for other years. Moreover, the market share data set is not adjusted with imports.

[18] Some scholars argue that in a liberalized regime the entry of foreign firms may crowd out the local investment especially in the absence of modern technology in local industries, which essentially means more market concentration (UNCTAD, 1997; Braunerhjelm et. et., 1998).

[19] For this study, we considered (motor vehicles, trailers and semi-trailers, railroad equipment and transport equipment, n.e.c) as single industry because both industries are more or less similar products.

Limitation of PROWESS electronic database: Firstly, this data base is itself a sample and most of the MNCs are not covered under this database. Secondly, the information for foreign firms is based on the equity holding and available only since 2001. Before 2001-02, the information for foreign equity holding was not available with CMIE PROWESS 3.1 database. Due to data constraint for foreign firms, the analysis for foreign investment has restricted for the period of 2001-02 to 2006-07.

1.7 Chapter Scheme

This study is organized into four chapters including this introduction. Chapter two begins with a detailed analysis of various policy initiatives undertaken by government of India with regard to FDI policy. Subsequently, the trends and patterns of FDI inflows in India in comparison to various developing nations and FDI inflows into different manufacturing industries are also presented in this chapter. Besides, this chapter also examines the trends and patterns, both in general and specific to industry, in market concentration during 1991-92 to 2006-07.

Chapter three analyses the impact of entry of MNCs on the industrial market structure both at overall and specific to various technology levels. This chapter begins with the analytical framework drawn from various theoretical and empirical studies. In addition, the relationship between changing levels of sales share of MNCs in total product sales and industrial market concentration is also examined. Furthermore, this chapter analyzes the determinants of industrial market concentration during reform period by using panel regression techniques.

The final chapter summarizes the findings of the study and draws some policy implications. This chapter highlights some issues for further research.

CHAPTER II

FOREIGN DIRECT INVESTMENT AND MARKET STRUCTURE IN INDIA'S MANUFACTURING SECTOR: POLICY, TRENDS AND PATTERNS

2.1 Introduction

In the recent years, there has been a resurgence in the investment flows through foreign direct investment into India. The liberalization of trade and foreign investment policy by India has played a pivotal role in shaping the current trend of FDI[20] and trade[21]. In response to liberalization measures, MNCs expanded their production activities in the developing economies with a view to improve their competitiveness and to maximize their returns on investment[22]. Interestingly, it is important to note that recent literature in Indian context have concluded that economic reforms have not provided any clear evidence of increased competition in Indian Industries (specifically to manufacturing sector) and also suggested that concentration have either increased or remained constant (Babu, 2002; Balakrishnan et al., 2002).

It is against this background that the present chapter examines the trends and pattern of FDI in the light of various reform measures introduced in the early nineties, as already explained at length in the introduction. This chapter aims at understanding the trends and patterns of market structure and FDI both in general and specific to various industries and technology groups with reference to India's manufacturing sector during liberalization period (1991-92 to 2006-07). The inquiry assumes importance because in a liberalized economy, market structure is not only shaped by the state policy, but the foreign direct investment is also very important determinant of market structure (Caves, 2007; Dunning et al., 2008).

[20] See foot note 8, page 8, and chapter one.

[21] As far as India trade as per cent of GDP is concern, it also increased from 15.7 in 1980 to 30.5 per cent in 2003 (Golder and Banga, 2007).

[22] At the same time, the study by Joseph (1997); Lundin e. al. (2007) further pointed out that among others the entry of foreign firms played pivotal role in determining the market structure in host country.

The chapter is broadly divided into six sections including introduction: Section two presents an overview of the policy measures initiated in India with regard to foreign direct investment. The methodology and data base adopted in this chapter are discussed in section three. This is followed by section four which presents an analysis on the trends and patterns of FDI inflows during reform period (1991-92 to 2006-07). Section five discusses the trends in market structure followed by the last section wherein the main findings are summarized.

2.2 Policy Overview

In the early years of independence, India's development strategy was inward-oriented. Government emphasized on self reliance to build a strong industrial base, especially after second industrial policy resolution of 1956. The study by Subramanian et al. (1996) identified four phase in the evolution of India's FDI policy. The first phase of FDI was from 1948 to mid-1960. In this period, government of India announced two industrial policy resolutions (1948 and 1956), where the entry of FDI was marked by cautions welcome. The controlling interest was expected to be with the Indians. In between two industrial policies[23], government introduced the Industries (Development and Regulation) Act of 1951 to regulate and control the development of private sector. The basic objective was to save scarce capital and to utilize these resources for development priorities. The second phase began by mid-1960 and lasted till late 1970s. In 1969, Monopolies and Restrictive Trade Practices Act (MRTPA)[24], was introduced to prevent concentration of economic power and control monopoly. In addition, Industrial Policy Statement (1973) was formulated which made licensing compulsory for all the firms above certain size[25]. In this period, external balance was not favorable and FDI outflows through transfer payment further deepened this

[23] First industrial policy resolution (IPR) was announced in 1948 and second in1956.

[24] The main objectives of the MRTP Act were to prevent the concentration of the economic power, the prohibition of Monopolistic Trade Practices, Unfair Trade Practices etc. for maintaining the efficiency in the industrial structure. For these purposes, the MRTP act registers both the large houses as well as the dominant undertakings with the Government under the MRTP Act.(Subramanian et el., 1996, Jalan, 1992).

[25] Under this policy, some industries were reserved for small scale firms. The large business house and foreign firms confirmed to a special list of core industries. Further, under Industrial Policy Resolution 1977, more number of industries entered in the list of small scale firms, to include over 800 products (see Jalan, 1992 and Athreya and Kapur, 2006)

situation. To control the outflows of foreign exchange on account of FDI, government of Indian formulated the Foreign Exchange Regulatory Act (FERA)[26] in 1973 that came into effect in January 1, 1974. With tightening of restrictions, this phase saw the exit of many leading MNCs, like IBM, Coco Cola and etc., from India.

By late 1970s, the country entered into the third phase with partial liberalization policy marked by selective relaxations of control in line with the recommendation of various committees set up by the government in the context of industrial stagnation since the mid 1960s. In this phase, particularly in the eighties, foreign firms were allowed to invest in India but in collaboration with Indian firms. It is seen that 100 per cent foreign owned firms were permitted only in highly export oriented industries. Industrial policy of 1980 was drafted with the aim to improve the competitiveness of domestic firms along with technology up-gradation and modernization. Likewise, MRTP Act was amended in 1985, the maximum asset limit for identified monopolies was raised and large businesses were permitted to invest in some restrictive sector. A number of policy and procedural changes were announced in 1985 and in later years, with the objective to overcome inefficiency developed in Indian industries during restrictive policy regime. Following this partial liberalization phase, government of India announced a series of liberalization measures in early nineties with the aim to improve industrial competitiveness as well as to prepare our industries to stand on their own to face international competition.

In line with the liberalization measures announced during eighties the government of India announced 'New Industrial Policy' (NIP) on July 24, 1991 as a part of 'New Economic Policy'. With the announcement of 1991 reform packages, India entered into the fourth phase known as the period of open door policy or market-led development strategy. The NIP deregulated the industrial economy in a substantial manner. The fundamental objectives of 1991 industrial policy were "to build on the gains already made, correct the distortions or weaknesses that might be crept in, maintain a sustained growth in productivities and gainful employment, and attain

[26]The principle objective of FERA was that all the branches of foreign companies and subsidiary with foreign equity operating in India should convert themselves into Indian companies with at least 60 per cent of local equity participation. Those Companies who were exporting maximum share of their output are exempted from this rule.

international competitiveness."[27] To attain these objectives, government introduced a series of initiatives with regard to policies such as industrial licensing, public sector policy[28], MRTP Act 1969, foreign investment and technology collaboration, industrial location policy, phased manufacturing programmes for new project and FERA[29]. The royalty payment limits were increased to encourage the technology import. Moreover, foreign equity[30] holding level was raised to 50 per cent, 74 per cent and 100 per cent. The returns were freely repatriable, except where the approval was subject to specific conditions such as lock-in period on original investment, dividend cap, foreign exchange neutrality, etc as per the notified sectoral policy[31].

In the light of above discussion, one can say that India's FDI policy has become highly liberal in the post reform period. Now, FDI in India is approved through two routes: automatic and case-by-case government approval. Under automatic route, foreign investment in Indian entity does not require prior government approval. The foreign investor only needs to inform the regional branch of Reserve Bank of India of their investment within 60 days of investment. Industries that do not fall under the category of automatic approval can get their proposals cleared through Foreign Investment Promotion Board. The government has been encouraging investment from Non-Resident Indians (NRIs) and Overseas Corporate Bodies (OCBs). NRIs and OCBs are allowed to invest in housing and real estate development sector. Furthermore, government has allowed them to hold up to 100 per cent equity in civil aviation companies, where otherwise foreign equity only up to 40 per cent was allowed. As a result of the liberalization of India's highly regulated FDI policy, there has been a voluminous increase in the flow of FDI to the country (Rajan et al., 2008, Singh, 2007).

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[27] Government of India, Handbook of Industrial Policy and Statistics, 2001, pp. 10.

[28] The 1956 industrial policy had reserved 17 industries for the public sector. The 1991 industrial policy reduced this number to 8. By May 2001, only 3 industries were reserved exclusively for public sector.

[29] With the amendment of FERA 1973, the ceiling limit of 40 per cent foreign equity has removed. FERA was later replaced by FEMA.

[30] See press note no. 14 (1997 series) date 13-06-08.

[31] For detail, see Naik 2006.

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Thus, we saw that in the pre-reform period, industrial licencing policy, industrial (Development and Regulation) act, location policy etc. affected the pattern of industrial concentration directly. In most of the industries the number of firms and their market shares were determined by capacity allocation (Jalan, 1992). Sectors with restrictive licensing became relatively more concentrated. It means the pattern of industrial concentration was largely shaped by the government policies rather than market forces during regulatory phase. With the liberalization measures, the number of restrictions was reduced. The free entry of foreign firms and local investors were allowed in almost all the sectors. All these changes affected the market structure in many sectors. The impact that entry of foreign firms has on industrial concentration in the domestic market is still a controversial issue in IO (Industrial Organization) literature. Easier access of capital and imports liberalization had removed constraint on the development of competitive enterprises. In some sectors concentration has increased while others showed lower level. In this context, the present chapter tries to analyze the trends of market structure and foreign investment.

2.3 Specific Methodology and Data Sources

The measuring of market concentration involves two components:

(i) Choice of a proper physical indicator is very important, which is neutral for all the firms and industries.

(ii) Choice of a suitable index that reflect sellers' concentration accurately, that is, how market concentration is to be measured?

There is the need to answer these two questions before measuring the market concentration.

2.3.1 Choice of the Proper Physical Measure

Market structure basically refers to the characteristics such as number and size distribution of firms, the entry barriers and the degree of competition. Put it differently, market structure explains the share of a firm in total market size. Size can be measured by various physical measures such as assets holding, value added, sales, etc. Using assets holding as a measure of concentration, the problem arises with

regard to valuation of assets. Asset valuation depends upon the accounting procedure of a firm that may vary from one firm to other firm. The choice of value added – *sales less the cost of inputs* – is a better measure of concentration as compared to measure based on assets holding since it is free of accounting manipulations. However, to get information about input cost is very difficult[32]. The most commonly used measure of size distribution is sale share of a firm in the market. Sales figures would be a fairly accurate and neutral for all the firms and industries and it is readily available from databases. A number of studies have used sales share as a proxy of size distribution -- (Joseph 2000; Subramanian 2005; Bhaskar 1992; Athreya et al., 2006; Beena S., 2006; Beena P., 2008; Elmas et al., 2009) – because it makes easy to compare average concentration level across firms and industries. The present study takes sales share of the firms as a measure size distribution.

2.3.2 Choice of Concentration Measure

As we have seen data limitations in the preceding (introduction) chapter which limits our analysis to use some selected concentration index for the present study. Some concentration measures such as price cost margin and rate of return on capital employed needs information for input cost and profits, which is not available with CMIE industry- market size and share dataset. Further, Herfindahl-Hirschman Index (HHI) needs information for all the firms in the industry (or information of all firms operating in the market) whereas CMIE database provides only a sample of firms operating in different sectors. If we calculate HHI based on sample firms then HHI can be over-estimated or under-estimated. If sample covers only leading firms and small size firms then HHI may show high level of concentration in either case. On the other hand, if sample covers either average size firms or small size firms (or large size and average size) then concentration value may be under-estimated.

The next commonly used measure of market structure is concentration ratio. The properties for concentration measures are, mostly, fulfilled by concentration ratio. Due to the absence of information of all the firms producing a product (as mentioned in the previous chapter in data sources section), the concentration ratio would be

[32] Study used product level information to measure market concentration. The industry market size and share data base is not giving information about input costs.

calculated with the assumption that the available data covers information for leading firms in the industry. The N-firm concentration ratio can be defined as the sum of sales share of leading N-firms in industry.

Symbolically,

$$CRn = \sum_{i=0}^{n} Si / s$$

$$CRn = \sum_{i=0}^{n} Pi$$

$$0 \leq CR_n \leq 1$$

Here,

CR_n = N-firm concentration ratio

S = Total product sales

S_i = Sales of i^{th} firm

P_i = Sales Share of i^{th} firm in total product sales

The value of N is quite arbitrary, present study assumes N = 3. The concentration ratio provides information about the relative distribution of product sales share of large three firms. The value of the concentration ratio falls in the range between zero and one. If value of CR is near to zero (or negligible), it indicates perfect competition (or equal size distribution of firms in the industries) and one indicates perfect monopoly. However, to trace clear picture about emerging market structure, the present study is dividing the index value into 3 sub ranges, such as, 0.0 to 0.3; 0.3 to 0.6 and 0.6 to 1. Further, the study assumes that the 0.0-0.3 is low level of concentration and 0.3-0.6 is medium concentration range and 0.6 – 1 is high concentration range.

Given the methods and data source for this chapter, the next section is trying to see the trends and pattern in FDI and market structure.

2.4 Trends and Patterns of Foreign Direct Investment

It is noticed from aforesaid conversation on FDI policy (Section 2.2) that government of India has initiated various liberalization measures to attract foreign direct investment in India. As a result of policy reform, the trend in FDI has been positive during reform period (Nagaraj, 2003; Singh, 2007; Singh and Jain, 2009).The underlying objective behind liberal policy regime was to reap the benefits from the flows of capital resources and other intangible assets like technology, management skills on the one hand and to develop competitiveness to access the world market on the other (Subramanian and Joseph, 1994; Virmani, 2004). Skills and technology diffusion from foreign investment came through MNCs to the rest of the economy through movement of skilled personnel, through input suppliers, through supplies of superior output to users and by imitation. In addition, FDI has been expected to be a catalyst in the growth process of developing countries, particularly in those economies, where capital is the major constraint for industrial development. As per theoretical propositions, in a liberalized economy, investment is not constrained by domestic saving because the shortage of capital can be supplement by foreign capital. Likewise, in a world of intensifying competition and accelerating technological change, the complimentary and catalytic role of FDI is very important.

Given the importance of FDI and policy initiatives announced by government of India, the FDI inflows towards India has increased very sharply in post reform period (see Table 2.1). It is worthwhile to point out that the data since 2000-01 are not comparable with the data prior to this year. It is on account of the change in the definition of foreign direct investment to bring in line with the international practices. In an effort to bring Indian definition in line with IMF's, the coverage of FDI since 2001-02 includes, besides equity capital (That is, RBI automatic route, SIA/FIPB route, NRI acquisition of shares), reinvestment earnings (including earnings of FDI companies and other direct capital (inter corporate debt transactions between related entities).

Table 2.1: FDI Inflows as per cent of GDP

Year	Foreign Direct Investment (per cent of GDP)
1990-91	0.03
1995-96	0.66
2000-01	0.96
2005-06	1.05
2006-07	2.36

Source: RBI, Handbook of Statistics on the Indian Economy, 2006-07.

Foreign investment as per cent of gross domestic product (GDP) increased from 0.03 per cent in 1991- 92 to 0.66 in 1995-96. Further, FDI inflows increased from 0.96 in 2001-02 to 2.36 per cent in 2006-07. The observed rise in FDI inflows is approximately 79 times during 1991-92 to 2006-07. It means that the FDI inflows as a per cent of GDP have improved significantly during liberalization era. Some scholars explained that the sudden rise in FDI was the result of the liberalization of India's highly regulated FDI policy and improvement in structural factors such as market size, quality of infrastructure, tax concession etc. (Virmani, 2004; Rajan et al., 2008).

On account of the removal of restrictions on FDI policy announced by most of the developing economies since late 1970s, it is not only important but worthwhile to compare the FDI performance across nations, as reported in Table 2.2. It is evident that the FDI inflows in developing economies grew rapidly in response to liberalization measures. These trends halted in late nineties as a result of East Asian crisis. While comparing the India's FDI trend with that of China and other countries, it is not so remarkable, but compared to India's past the FDI inflow has increased very sharply in recent period. The interesting point to be noted here is that the FDI inflow in India, in recent years, has improved at much faster pace in comparison to any of the developing countries as reported in Table 2.2. For instance, the FDI inflow towards India increased from US$ 7.61 billion in 2005 to US$ 22.95 billion in 2007. As per UNCTAD (2007), India emerged second (after China) most important destination for foreign investors.

Table 2.2: FDI Inflows by Host Regions (US$ Billions)

Year / Country	1980	1985	1990	1995	2000	2005	2007
Mexico	2.10	1.98	2.63	9.53	17.98	20.95	24.69
Brazil	1.91	1.42	0.99	4.41	32.78	15.07	34.58
China	0.06	1.96	3.49	37.52	40.71	72.41	83.52
India	0.08	0.11	0.24	2.15	3.59	7.61	22.95
Indonesia	0.18	0.31	1.09	4.42	-4.50	8.34	6.93
Pakistan	0.06	0.05	0.28	0.49	0.31	2.20	5.33
Sri Lanka	0.04	0.02	0.04	0.07	0.17	0.27	0.53
Malaysia	0.93	0.69	2.61	5.82	3.79	3.97	8.40
Philippines	0.11	0.11	0.55	1.46	2.24	1.85	2.93
Singapore	1.24	1.05	5.57	11.54	16.48	13.93	24.14
Thailand	0.19	0.16	2.58	2.07	3.35	8.05	9.58

Source: UNCTAD, Database 2008.

The change in approvals and the percentages of realization of FDI over time indicated that India's approach (policy and procedures) towards FDI had undergone significant change. Table 2.3 pointed out that FDI approvals rose very sharply compared to actual realization of FDI inflows in the early years of economic reforms. This may be because FDI approval took time for actual realization[33]. Since 2000, the realization of FDI inflow is more than that of approval of FDI (refer Table 2.3). For instance, the amount of actual realization of FDI inflow increased from 18.1 per cent in 1992 to 71.67 per cent in 2000 and further to 218 per cent in 2006. It is because the setting up of Foreign Investment Implementation Authority for quick translation FDI approvals into realization as well as most of the FDI through automatic approval enabled India to turn approval FDI into actual inflow of FDI (Naik, 2006; Singh and Jain, 2009).

[33] On average it takes 11 procedure and 89 days to start business in India. In China, it takes 12 procedure and 41 days to start a business (Indian Economic Review, 2005).

Table 2.3: FDI Approvals and Inflows since 1991

Year (Jan. –Dec.)	Amount of FDI Approvals (Rs. Crores)	Amount of FDI Inflows (Rs. Crores)	Realization Rate (in per cent)
1991 (Aug-Dec)	504.90	353.48	70.01
1992	3817.89	691.20	18.10
1993	8861.80	1861.96	21.01
1994	8955.22	3112.23	34.75
1995	30882.11	6485.36	21.00
1996	30886.05	8752.19	28.34
1997	50388.86	12989.76	25.78
1998	27589.57	13269.21	48.10
1999	25140.28	10166.71	40.44
2000	17236.97	12353.73	71.67
2001	20939.68	16777.75	80.12
2002	11058.10	18195.56	164.55
2003	5416.59	11617.17	214.47
2004	8741.25	17266.52	197.53
2005	7899.53	19299.09	244.31
2006	23003.61	50357.25	218.91
Total	281322.40	203549.19	72.35

Source: SIA, Newsletter, Various Issues.

Table 2.4 showed compound growth rate of FDI inflows in some selected manufacturing industries. The growth rate of FDI inflows was found to be positive in selected manufacturing industries, which indicated that the inflow of investment rose across various industries during 1996 to 2006. However, the growth of FDI inflow differs from industries to industries, some industries namely electronic equipment, transportation, telecommunication, metallurgical and drugs and pharmaceuticals industries, showed very high rate of growth of foreign investment compared with the industries like fuels and chemicals industries (see Table 2.4).

Table 2.4: Compound Growth Rate of FDI Inflows in Selected Manufacturing Industries (1996 to 2006)

Sectors	Compound Growth Rate (%)
Electricals Equipment (Incl s/w & Elec)	22.41
Transportation Industry	18.69
Telecommunications	14.35
Fuels (Power & Oil Refinery)	7.97
Chemicals (Other than Fertilizers)	6.96
Drugs and Pharmaceuticals	10.97
Metallurgical Industries	14.63
Miscellaneous Mechanicals & Engineering	6.78

Source: Indiastat 2001-02, SIA Newsletter December 2006.

It is evident that, among countries, Mauritius is the largest direct investor in India. The firms based in Mauritius accounted for around 41 per cent share of FDI inflow in India during Aug. 1991 to 2007 (refer Table 2.5).

Table 2.5: Share of Top Country Investors in India

Country	Percentage to Total FDI Inflows (Aug. 1991 to March 2007)
Mauritius	41.53
US	11.39
Netherlands	5.67
Japan	5.02
Singapore	4.63
UK	4.14
Germany	3.46
France	1.78
Switzerland	1.58
All Other	20.84
Total	100.00

Source: SIA, Newsletter, 2007.

Following Mauritius, US (11.39 per cent), Netherland (5.67 per cent), Japan (5.02 per cent) etc are on third, fourth and fifth position, respectively. The major chunk of FDI in India from top investors are primarily concentrated in fuels, electrical equipment, telecom, food processing, service, power, transportation sectors etc (SIA Newsletter, 2007). Interesting, it needs to be pointed out that the FDI inflow from Mauritius to India is really misleading. It is so because Mauritius has low rates of taxation and an agreement with India on double tax avoidance regime. On this account, most of the firms have set-up dummy companies before investing in India. Nonetheless, the major part of FDI from Mauritius to India is round tripping by Indian firms.

2.5 Trends and Patterns in Market Concentration

2.5.1 Overall Trends

In this section, we tried to explore the emerging trends and patterns of market structure both in general and specific to industry by using product level data set in the manufacturing sector over the post reform period (1991-92 to 2006-07).

Table 2.6: General Trends and Patterns of Market Concentration in India's Manufacturing Sector

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	**1994-95**	**1996-97**	**2001-02**	**2004-05**	**2006-07**
Low LC (0.0 -0.3)	32 (16)	30 (14)	27 (14)	34 (16)	24 (12)	20 (10)
Medium LC (0.3-0.6)	50 (26)	61 (30)	59 (28)	68 (33)	59 (28)	48 (23)
High LC (0.6 -1)	111 (58)	114 (56)	120 (58)	106 (51)	125 (60)	140 (67)
Total No. of Products	193 (100)	205 (100)	206 (100)	208 (100)	208 (100)	208 (100)
Total No. of Firms	1475	2175	2477	3464	3116	2700
Percentage Sales of Sample Firms to Total Sales	50	37	50	51	65	72

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

The number of products used for analysis is varied from 193 in 1991-92 to 208 in 2006-07 (see Table 2.6). Further, the trend of market structure explored on the basis of six points of times such as 1991-92, 1994-95, 1996-97, 2001-02, 2004-05 and 2006-07. The trend in market structure on the basis of 3-firms Concentration Ratio (CR3) is presented in Table 2.6. It is apparent that the number of products in low concentration level (CL) hovered around 16 per cent till 2001-02. Post 2001-02, it declined to 12 per cent in 2004-05 and then to 10 per cent in 2006-07. While, the number of products in medium CL expanded from 26 per cent in 1991- 92 to 33 per cent in 2001-02 and subsequently declined to 23 per cent in 2006-07 (refer, Table 2.6). However, the number of products in higher concentration has increased during reform period. It increased from 58 per cent in 1991-92 to 67 per cent in 2006-07 with some fluctuation. This inferred that the market position of leading firms further strengthened with globalization. This may be because the removal of MRTPA (1969) and openness of trade helped the existing market leaders to realize minimum efficiency scale and consequently to strength their market share. The result of present study is consistent with existing literature on industrial concentration during reform period (see, Pushpangadan et al., 2008, 2006; Pant et al., 2005).

The declining trend of number of firms is also noticed in post 2001-02. For instance, the number of firms increased from 1475 in 1991-92 to 3464 in 2001-02 and afterward declined to 2700 in 2006-07 (see Table 2.6). It is worthwhile to note that even though the number of firms has declined in the recent years, the sales share of sample firms in total industry sales has increased. The theory of market structure would interpret such a situation as market structure acquiring oligopolistic characteristics. The study by Subramanian (2005) argued that the number of firms increased in the early period of reform was due to easy entry of new firm. But, in the later period, the entry of foreign firms through collaboration with existing market leaders pushed the unviable firms from market.

2.5.2 Industry Level Concentration

After examining the overall trends and patterns of market structure, we turned to explore the trend in market structure on the basis of the technological intensity of industries. It is because overall trend and pattern gave general picture about

manufacturing sector and but failed to explain the industry specific variations. For this exercise, the selection of the industries for industry specific analysis are based on the maximum number of products availability from Industry Market Size and Share data base and further classified selected industries according to OECD (2007) global technology intensity. The logic behind the division of industries on the basis of global technology group is to test relationship between technology group and market concentration. The relevant question in this context is whether different technology levels affect market structure differently. In this context, scholars argue that in a liberalized regime the entry of foreign firms may crowd out the local investment especially in the absence of modern technology in local industries, which essentially means more market concentration (UNCTAD, 1997; Braunerhjelm et al., 1998). On this account, the present study is an attempt to explore the relationship between different technology groups and market concentration in India's manufacturing industries during post reform period.[34]

2.5.2.1 Food Products, Beverages and Tobacco

The trends in market concentration for food and beverage industry, belonging to low technology level, are presented in Table 2.7. It is evident that the number of products in lower concentration has declined from 43 per cent in 1991-92 to 23 per cent in 2006-07. Correspondingly, the products that fall in medium concentration range increased from 13 per cent in 1991-92 to 34 per cent in 1996-97 and subsequently declined to 26 per cent in 2006-07. The declining trend of number of products is observed in high concentration range from 1991-92 to 2001-02 and increased during post 2001-02 (refer Table 2.7). It inferred that market concentration rose during post liberalization.

The differences in concentration across products have also been evident in the Table 2.7. For instance, milk products, confectionary, biscuits, poultry, beer, soft drinks, cigarette, tea, etc. showed more concentration as compared with products like ice-cream, butter ghee, potato chips, rice, mineral product etc. that showed low level of concentration in the recent period. The study by Pushpangadan and Shanta (2004)

[34] For details refer Section 1.6.4 in Chapter 1.

visualized similar result in India's food and beverages industry and also reported that India's food and beverages industry is a typical case of dominant firms with fringe competition.

Table 2.7: Market Concentration in Food Products, Beverages and Tobacco (Low-Technology Industries)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	**1994-95**	**1996-97**	**2001-02**	**2004-05**	**2006-07**
Low LC (0.0 -0.3)	13 (43)	12 (35)	10 (29)	10 (29)	8 (23)	8 (23)
Medium LC (0.3-0.6)	4 (13)	9 (27)	12 (34)	12 (34)	9 (26)	9 (26)
High LC (0.6 -1)	13 (43)	13 (38)	13 (37)	13 (37)	18 (51)	18 (51)
Total No. of Products	30 (100)	34 (100)	35 (100)	35 (100)	35 (100)	35 (100)
Total No. of Firms	204	376	525	752	641	554
Percentage Sales of Sample Firms to Total Sales	27	11	38	41	48	56

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

The number of firms has been declining since 2001-02, however, increasing trend is observed in terms of sales share of sample firms (see Table 2.7). The possible explanation is that due to intensive external competition some firms merged with each other which lead others to left out from the market (Pant et al., 2005). It may imply that the increasing market concentration acts as barriers to entry for new firms[35].

2.5.2.2 Textiles, Textile Products, Leather and Footwear

The number of products showed declining trend in low and medium concentration range as reported in the Table 2.8. For instance, the number of products was around 40 per cent in low LC and 27 per cent in medium LC in 1991-92 which came down to 31 per cent and 13 per cent in 2006-07 in their respective concentration range.

[35] See Orr 1974, Saikia 1997.

Table 2.8: Market Concentration in Textiles, Textile Products, Leather and Footwear (Low-Technology Industries)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	1994-95	1996-97	2001-02	2004-05	2006-07
Low LC (0.0 -0.3)	6 (40)	6 (38)	6 (37)	5 (31)	5 (31)	5 (31)
Medium LC (0.3-0.6)	4 (27)	5 (31)	2 (13)	3 (19)	3 (19)	2 (13)
High LC (0.6 -1)	5 (33)	5 (31)	8 (50)	8 (50)	8 (50)	9 (56)
Total No. of Products	15 (100)	16 (100)	16 (100)	16 (100)	16 (100)	16 (100)
Total No. of Firms	107	191	203	259	257	227
Percentage Sales of Sample Firms to Total Sale	19	16	14	15	20	23

Source: Compiled from various issues of CMIE, Industry Market Size and Shares.
Note: Figures in brackets are percentage.

At the same time, the number of products in above 60 per cent (or high) concentration has increased from 33 per cent in 1991-92 to 56 per cent in 2006-07. It meant that existing market structure turned as oligopoly market structure during the reform period. The differences in the concentration of various products also applied to this industry as we seen above in the case of food products, beverages and tobacco industry. Similarly to other industries, the number of firms has declined in the recent period.

2.5.2.3 Wood, Pulp, Paper, Paper Products, Printing and Publishing

It is seen that the trend of market concentration did not show any change across three concentration ranges till 1994-95 (see Table 2.9). Thereafter, the number of products in high concentration range has come down from 60 per cent in 1994-95 to 20 per cent in 2001-02 and further increased to 60 per cent in 2006-07. Alternatively, the declining trend in number of products has been noticed in medium and low levels of concentration, in the recent period (see Table 2.9). This finding corroborates our expectation that concentration increases with economic reforms. The number of firms declines after 2001-02 with varying concentration in products (refer Table 2.9).

Table 2.9: Market Concentration in Wood, Pulp, Paper, Paper Products, Printing and Publishing (Low-Technology Industries).

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	1994-95	1996-97	2001-02	2004-05	2006-07
Low LC (0.0 -0.3)	1 (20)	1 (20)	1 (20)	2 (40)	2 (40)	1 (20)
Medium LC (0.3-0.6)	1 (20)	1 (20)	2 (40)	2 (40)	1 (20)	1 (20
High LC (0.6 -1)	3 (60)	3 (60)	2 (40)	1 (20)	2 (40)	3 (60)
Total No. of Products	5 (100)	5 (100)	5 (100)	5 (100)	5 (100)	5 (100)
Total No. of Firms	36	49	50	97	80	64
Percentage Sales of Sample Firms to Total Sales	54	50	42	53	57	74

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

2.5.2.4 Manufacturing of Rubber and Plastic Products

It is worthwhile to note that none of the products undertaken in rubber and plastic products industry came under low concentration range, as shown in the Table 2.10.

Table 2.10: Market Concentration in Manufacturing of Rubber and Plastic Products (Medium Low-Technology Industries)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	1994-95	1996-97	2001-02	2004-05	2006-07
Low LC (0.0 -0.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Medium LC (0.3-0.6)	3 (43)	3 (30)	6 (78)	4 (40)	2 (20)	2 (20)
High LC (0.6 -1)	4 (57)	7 (70)	4 (40)	6 (60)	8 (80)	8 (80)
Total No. of Products	7 (100)	10 (100)	10 (100)	10 (100)	10 (100)	10 (100)
Total No. of Firms	66	95	103	147	124	106
Percentage Sales of Sample Firms to Total Sales	96	93	93	89	88	86

Source: Compiled from various issues of CMIE, Industry Market Size and Shares.
Note: Figures in brackets are percentage.

For medium concentration range, the number of products has indicated downward and fluctuating trend which is not seen in the case of high concentration range. For instance, it increased from 57 per cent (1991) to 60 per cent (2001-02) and further to 80 per cent in 2006-07. This finding gave us indication that the market concentration increased for some product lines. The main products which showed an increase-in concentration were luggage, synthetic rubber, automobile tubes, cycles' tyres, cycles' tubes etc. Moreover, the declining number of firms, further, confirmed that the concentration level has increased in some product line since 2001-02 (see Table 2.10). Similar results were noticed from Subramanian (2005).

2.5.2.5 Other Non-Metallic Mineral Product

Table 2.11 brings the forefront that number of products in other non-metallic mineral products industry revealed rising trends in low concentration level up to 2001-02 and further it plummeted to zero whereas it increased up to 2004-05 in case of medium concentration hereafter showed declining trend up to 2006-07. Nonetheless, it has declined in high concentration level, that is, to 18 per cent in 2001-02 from 50 per cent (1991-92). Thereafter, the increasing number of products is observed in high concentration level since 2001-02 (refer Table 2.11).

Table 2.11 Market Concentration in Other Non-Metallic Mineral Products (Medium Low-Technology Industries)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	1994-95	1996-97	2001-02	2004-05	2006-07
Low LC (0.0 -0.3)	1(10)	2 (18)	2 (18)	4 (36)	0 (0)	0 (0)
Medium LC (0.3-0.6)	4 (40)	5 (45)	5 (45)	5 (45)	8 (73)	7 (64)
High LC (0.6 -1)	5 (50)	4 (36)	4 (36)	2 (18)	3 (27)	4 (36)
Total No. of Products	10 (100)	11 (100)	11 (100)	11 (100)	11 (100)	11 (100)
Total No. of Firms	90	147	158	222	224	196
Percentage Sales of Sample Firms to Total Sales	74	79	79	69	86	91

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

Similar differences in concentration for different products found in this case too, over the period of time. For instance, the products like abrasives, cement, glass hollowares etc visualized higher concentration level, the products namely asbestos cement and products, refractories, glass, diamonds showed negligible decline or remain constant trend of market concentration with time

Furthermore, the number of firms rose till 2004-05 and then declined in recent period, that is, from 90 in 1991-92 to 224 in 2004-05 which further declined to 196 in 2006-07. It is observed that the lion share of industrial production is accounted by few handsome producers, which is an indication of swelling industrial market concentration.

2.5.2.6 Basic Metals and Fabricated Metal Products

The number of product showed declining trend in low concentration range, as reported in Table 2.12. It increased to 22 per cent (2001-02) after remaining stable around 12 per cent (1991-97) which further plummeted to six per cent in 2006-07, with respect to low concentration.

Table 2.12: Market Concentration in Basic Metals and Fabricated Metal Product (Medium Low-Technology Industries)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	**1994-95**	**1996-97**	**2001-02**	**2004-05**	**2006-07**
Low LC (0.0 -0.3)	2 (12)	2 (12)	2 (12)	4 (22)	3 (17)	1 (6)
Medium LC (0.3-0.6)	3 (18)	4 (24)	4 (24)	8 (45)	7 (39)	8 (44)
High LC (0.6 -1)	12 (70)	11 (65)	11 (65)	6 (33)	8 (44)	9 (50)
Total No. of Products	17 (100)	17 (100)	17 (100)	18 (100)	18 (100)	18 (100)
Total No. of Firms	148	236	259	336	346	252
Percentage Sales of Sample Firms to Total Sales	77	77	81	69	87	91

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

Further, 17 percentage points increase has been observed in 2006-07 after declining to 33 per cent in 2001-02 in case of high concentration level (see Table 2.12). This inference is in line with the previous result, which indicated the positive association between economic reform and industrial market concentration. The important point needs to mention that the trend in market concentration turned as U-type. It means that market concentration reduced in early year of economic reforms, but revised trend (increase in concentration) has noticed in the recent period.

It is also seen that the products namely; transmission tower structure, steel pipe and tubes metal, steel wire and rope containers, primary aluminium etc., showed upward trend in concentration. However, the products such as aluminium foils, aluminium products, alloy steel, ferro alloy, steel etc., showed downward trend of concentration. Similar to other industries, the number of firms has declined in recent period. It may be due to cost disadvantage for some firms that made difficult for them to maintain their market share in the era of globalization.

2.5.2.7 Chemicals Excluding Pharmaceuticals

It is evident that the trend in market concentration did not show any significant change, in chemicals excluding pharmaceuticals industry, over the study period in all three levels of concentration (refer Table 2.13). It means that economic reforms did not reduce market concentration, as it was expected from economic reforms. The study by Subramanian (2005) also noted only negligible change in concentration level of this industry during reform period.

It is worthwhile to mention that major chunk of number of products are corned in above 60 per cent (higher concentration range) over the study period. In 1991-92, around 69 per cent products were lied in (above 60 per cent concentration levels) higher concentration range which further increased to 72 per cent in 2006-07. One can explain this situation with scale of operation of chemical industry. Due to high scale of operation only few firms can access minimum efficiency of operation, which definitely means higher concentration in that industry

Table 2.13: Market Concentration in Chemicals Excluding Pharmaceuticals (Medium High Technology Industries)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	1994-95	1996-97	2001-02	2004-05	2006-07
Low LC (0.0 -0.3)	3 (6)	2 (4)	3 (6)	6 (12)	5 (10)	3 (6)
Medium LC (0.3-0.6)	13 (25)	15 (29)	13 (25)	9 (18)	10 (20)	11 (22)
High LC (0.6 -1)	35 (69)	34 (67)	35 (69)	36 (70)	36 (70)	37 (72)
Total No. of Products	51 (100)	51 (100)	51 (100)	51 (100)	51(100)	51 (100)
Total No. of Firms	388	475	565	673	597	500
Percentage Sales of Sample Firms to Total Sales	77	85	87	77	88	89

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

Further, concentration difference has been noted in different product lines. For instance, the product like benzene, methanol, ethylene glycol, glycerine, fatty acids, hexamine, nitric acid etc. showed higher concentration, on the other hand, the products line namely urea, dyes and pigments, aniline calcium carbide etc. indicated lower concentration. Similar to other industries, the number of firms was increasing till 2001-02 and then it started declining (see Table 2.13).

2.5.2.8 Machinery and Equipment, n.e.c.

In case of machinery and equipment industries, the rising trend with regard to number of products has been observed in case of higher level of concentration after 2001-02 against low and medium level of concentration which, in-turn, gave some indication of increase in market concentration (see Table 2.14). In short, the mixed-trend has been observed in the case of this industry. The products like boilers, engines of all types, compressors, values, agriculture machinery, tractors, earth moving machinery etc showed upturn in level of concentration during reform period. Against this, low concentration has observed in products like chemical machinery, gears, fire protection machinery, machine etc. Further, the declining trend in number of firms further strengthened that concentration has increased in the recent period.

Table 2.14: Market Concentration in Machinery and Equipment, n.e.c. (Medium-High-Technology Industries)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	**1994-95**	**1996-97**	**2001-02**	**2004-05**	**2006-07**
Low LC (0.0 -0.3)	2 (8)	1(4)	1 (4)	1 (4)	1 (4)	1 (4)
Medium LC (0.3-0.6)	12 (48)	11 (42)	6 (23)	1 (54)	10 (38)	5 (19)
High LC (0.6 -1)	11 (44)	14 (54)	19 (73)	11 (42)	15 (58)	20 (77)
Total No. of Products	25 (100)	26 (100)	26 (100)	26 (100)	26 (100)	26 (100)
Total No. of Firms	255	333	347	475	442	375
Percentage Sales of Sample Firms to Total Sales	87	91	93	85	92	97

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

2.4.2.9 Motor Vehicles, Trailers and Semi-Trailers Including Railroad Equipment and Transport Equipment, n.e.c.

Table 2.15 presented concentration trends in case of motor vehicles, trailers and semi-trailers including railroad equipment and transport equipment, n.e.c. industry belonging to medium high technology group. It is evident from that the number of products in high concentration has increased from 80 per cent in 1991-92 to around 100 per cent in 2006-07. It meant in the recent years, whole market share has controlled by dominant firms (see Table 2.15). Study by Athreya and Kapur (2006) also supported our findings. They argued that two third of market share in medium and heavy vehicles have controlled by Tata. In passenger vehicles sector, 46 per cent of market share has controlled by Maruti Udyog. This would mean the market structure in this industry is an oligopoly or near to monopoly. Interestingly, the products like light commercial vehicles, bicycles, gaskets, radiators, crack-shafts, brake linings, break assemple, axle shaft etc. showed continuously up-ward trend of concentration.

Table 2.15: Market Concentration in Motor Vehicles, Trailers and Semi-Trailers Including Railroad Equipment and Transport Equipment, n.e.c. (Medium-High-Technology Industries)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	1994-95	1996-97	2001-02	2004-05	2006-07
Low LC (0.0 -0.3)	2 (8)	2 (8)	0 (0)	0 (0)	0 (0)	0 (0)
Medium LC (0.3-0.6)	3 (12)	4 (16)	4 (16)	6 (24)	2 (8)	0 (0)
High LC (0.6 -1)	20 (80)	19 (76)	21 (84)	19 (76)	23 (92)	25 (100)
Total No. of Products	25 (100)	25 (100)	25 (100)	25 (100)	25 (100)	25 (100)
Total No. of Firms	103	131	131	267	212	159
Percentage Sales of Sample Firms to Total Sales	98	98	98	100	99	99

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

Some of the products, namely, passenger car, three wheelers, piston rings, steering gear, automotives values etc showed negligible change in concentration. Further, the declining number of firms in the recent period further confirmed the presence of dominant firms in this industry.

2.5.2.10 Radio, TV and Communications Equipment

Table 2.16 brings forefront that the number of product in radio, TV and communication equipment industry showed declining trend in low concentration range, it plummeted to 14 per cent in 1994-95 and further to 13 in 2006-07. It is also observed that the major chunk of the products is corned in above 60 per cent concentration levels. In 1991-92 the number of products in above 60 per cent range was around 50 percent and later increased to 74 per cent in 2006-07, as reported in Table 2.16. It indicated that market concentration has increased in the recent period in this industry. Interestingly, the U-shape concentration curve has been observed in high concentration level. Contrary to high concentration range, the number of products plummeted in medium and low concentration range with high fluctuations

(see Table 2.16). Similarly, it is verified by study on electronic industry (Joseph, 1997).

Table 2.16: Market Concentration in Radio, TV and Communications Equipment (High Technology)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	1994-95	1996-97	2001-02	2004-05	2006-07
Low LC (0.0 -0.3)	2 (33)	1 (14)	1 (14)	0 (0)	0 (0)	1 (13)
Medium LC (0.3-0.6)	1 (17)	3 (43)	3 (43)	4 (50)	4 (50)	1 (13)
High LC (0.6 -1)	3 (50)	3 (43)	3 (43)	4 (50)	4 (50)	6 (74)
Total No. of Products	6 (100)	7 (100)	7 (100)	8 (100)	8 (100)	8 (100)
Total No. of Firms	55	92	82	164	111	91
Percentage Sales of Sample Firms to Total Sales	67	87	85	89	90	98

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

It may be because of huge entry of MNCs in the early period of reforms pushed unviable firms from the market by using cost effective and modern techniques of products. The rising concentration can be seen in products like audio equipments, television receivers, television picture tube, television instruments etc. But some product, such as, capacitors, printed circuit board etc. showed down ward trend of concentration. The number of firms showed rising trends till 2001-02 but latter it started declining.

2.5.2.11 Medical, Precision and Optical Instruments

It is difficult to explore the emerging trend in concentration in medical, precision and optical instrument industry because of data constraint. Under this industry, we have information only about one product. On the basis of available information, the concentration ratio did not show any change in concentration trend till 2004-05, but later it showed some indication of concentration (refer Table 2.17). This might be

because the number of firms in recent period is declined to 16 and even sales share increased to 100 per cent in 2006-07.

Table 2.17: Market Concentration in Medical, Precision and Optical Instruments (High Technology)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	1994-95	1996-97	2001-02	2004-05	2006-07
Low LC (0.0 -0.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Medium LC (0.3-0.6)	1 (100)	1 (100)	1 (100)	1 (100)	1 (100)	0 (0)
High LC (0.6 -1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)
Total No. of Products	1 (100)	1 (100)	1 (100)	1 (100)	1 (100)	1 (100)
Total No. of Firms	11	17	14	20	23	16
Percentage Sales of Sample Firms to Total Sales	63	100	95	85	100	100

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

2.5.2.12 Office, Accounting and Computing Machinery

Table 2.18 showed the concentration trend in office, accounting and computing machinery industry. In this industry the available information is around for two products. From CR3, the number of products in low concentration range increased till 2001-02 and subsequently declined to zero in 2006-07. From medium and high concentration range the emerging trends showed somewhat positive concentration in this industry in the recent years (see Table 2.18). One interesting thing emerged in this industry is that the number of firms has continuously increased over the period with increasing sales share of number of firms.

Table 2.18: Market Concentration in Office, Accounting and Computing Machinery (High Technology)

(LC) Level of Concentration	No. of Products (3- Firms Concentration Ratio)					
	1991-92	1994-95	1996-97	2001-02	2004-05	2006-07
Low LC (0.0 -0.3)	0 (0)	1 (50)	1 (50)	2 (100)	0 (0)	0 (0)
Medium LC (0.3-0.6)	1 (100)	0 (0)	1 (50)	0 (0)	2 (100)	1 (50)
High LC (0.6 -1)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)	1 (50)
Total No. of Products	1 (100)	2 (100)	2 (100)	2 (100)	2 (100)	2 (100)
Total No. of Firms	12	33	40	52	57	60
Percentage Sales of Sample Firms to Total Sales	29	60	45	47	84	89

Source: Compiled from various issues of CMIE, Industry Market Size and Shares
Note: Figures in brackets are percentage.

2.6. Summary of Findings

In this chapter, we analyzed the trends and patterns of FDI and market structure against the back drop of liberalization policy. The emerging conclusions on the basis of trends and pattern of FDI are as follows: Firstly, FDI inflow as per cent of GDP has increased during 1991-92 to 2006-07. Further, in comparison of China and other East Asian economies, the FDI inflow in India is not very impressive. But compared to India's past, the trend of FDI improved remarkably during post liberalization era. Secondly, FDI approvals as well as realization of FDI have also increased. The realization of FDI has increased at a much faster pace than FDI approvals during post 1996-97. Finally, the growth of FDI in manufacturing industries also found positive, but it is not same for all the industries.

Trend in market structure on the basis of N firm concentration is also examined in post liberalization regime. From overall trend and pattern analysis, it is evident that market concentration has increased in the manufacturing sector during liberalization era. To confirm this overall finding, we did industry specific analysis and further classified those industries into different technology levels. The industry specific analysis indicated that almost all the industries showed rising trend in market

concentration during reform period. From industry specific analysis, two types of concentration trend has been noticed: first, industries that belonged to low technology group (except textiles, textile products, leather and footwear), medium low technology group and high technology group (only radio, TV and communications equipment industry) indicated a downturn in concentration in the early years of economic reforms and after 2001-02 the concentration trends again increased. The possible reasoning for this type of concentration trends can be explained with type of FDI that came in the economy. Initially, the MNCs entered in local market though collaboration with local firms due to lack of local market information. This process helped the MNCs to set their base in new market. With time, MNCs used their specific knowledge along with other market strategies (predatory prices, high advertisement, etc.), which enables them to capture local market either through merger or to force the existing firms out of market. Second, industries belonged to medium high and high technologies industries (except radio, TV and communications equipment industry) and low technology (only textiles, textile products, leather and footwear industry) showed straight upward trend in market concentration. It may be because liberalization removed market size constraint for existing producer. In this process, the liberalization provided opportunity for competitive firms to expand their size in the world market. If only large firms grew with liberalization because existing firms have easy access of capital and other inputs which led to rise market concentration in the reform period. Earlier studies (Balakrishnan et al., 2002; Pant et. al, 2005; Subramanian, 2005; Pushpangadan et. al, 2008) have also observed the positive association between market concentration and economic reforms in India's manufacturing industries. Furthermore the difference in product concentration has been noticed almost all the industries. Some products have shown declining trend and others showed a rising trend in concentration during post reform period.

Further, the number of firms in recent years showed decline across all industry groups. The declining number of firms might be because the competition from international market and the entry of MNCs pushing weak firms out of market through price competition, product differentiation among other means of expanding market share (Pillai 1978; Caves 1996, 2007; Newfarmer, 1978; Lall, 1979).

On the whole, the empirical findings suggested that market concentration had not declined during reform period. In some industries, concentration has increased and other showed no change in market concentration.

CHAPTER III

FOREIGN DIRECT INVESTMENT AND INDUSTRIAL CONCENTRATION: EMPIRICAL EVIDENCE

3.1 Introduction

The preceding chapter examined the trends and patterns of foreign direct investment and market structure. It was observed that during the post reform period along with an unprecedented increase in the inflow of FDI the market concentration also showed an upward trend. The empirical literature in case of different developed and developing economies suggested that, among others, FDI by MNCs played a crucial role in determining the industrial market structure of host country though the direction of relationship is uncertain[36]. Given the findings of the previous chapter and the on-going debate in the empirical literature on the role of FDI in determining the host country market structure, the objective of this chapter is to explore the role that FDI played in shaping the market concentration in India's manufacturing sector during liberalization period. To be more specific, the issue addressed in this chapter is with regard to the role of foreign direct investment in determining market concentration. In addition, this chapter observed how concentration level is changing across industries and at different technology levels during 2001-02 to 2006-07. Moreover, the industries specific factors[37] are taken care to check the importance of FDI in determining the concentration levels in different industries.

The chapter is divided broadly into five sections including introduction. Section II presented the analytical framework drawn from the existing empirical and theoretical literature. Section III examined the trends and patterns in market concentration and sales share of foreign firms in total product sale at the aggregate level and disaggregates level in terms of technological intensity. Section IV discussed hypothesis for empirical testing and reported the results of the econometric model and

[36] See Lall, 1978; UNCTAD, 1997; Caves et al., 1980; Driffield, 2001.

[37] The factors that is specific to some industries such as capital-intensity to reflect the choice of technique, import-intensity to capture the quality-consciousness, advertisement expenditure, R&D expenditure etc,

also interprets the empirical findings followed by the last section wherein the chapter is concluded with a summary and concluding observations.

3.2 Analytical Framework

In this section, we provide brief overview of theories and evidence from existing literature to develop an analytical framework for our empirical analysis. The analytical framework discusses the role of foreign direct investment in determining the host country industrial market structure.

3.2.1 FDI and Market Structure

The presence of foreign MNCs may exert a significant influence on the host country market structure. However, the available theoretical explanation and empirical evidence showed the relationship between FDI and market structure to be highly complex (UNCTAD, 1997; Caves, 1996). The FDI can either increase or decrease the degree of industrial concentration depending upon the specific context.

As per UNCTAD, World Investment Report, (1997; 2000), the mode[38] of entry of foreign investment and the nature of industry where Transnational Corporations (TNCs) are entering require special attention from regulatory authority to maintain the proper functioning of the market. If MNCs are entering in highly concentrated industry and the mode of entry is green-field investment, the sudden impact of the entry of MNCs will increase the number of firms in the industry, which will provide competition to the existing market leaders. But the long run effect on market structure will depend upon competitive strength of the host country industrial base, absorption capacity of the nation and the technology gap between locals and MNCs firms. If domestic firms have achieved minimum threshold levels of development then over time they will further improve their technology base through technology diffusion from MNCs. In this process, technology gap between local firms and MNCs will come down and consequently, competitive market structure might emerge. Contrary to previous statement, if technology gap is widening between local firms and MNCs over time due to poor absorption capacity of local firms then MNCs will crowd out

[38] Mode of entry includes entry through two ways (i) merger and acquisition and (ii) green field investment.

the local investment and consequently market concentration will increase in the long run (Haller, 2004; UNCTAD, 1997). If foreign direct investment is coming in the form of merger and acquisition, then FDI will not bring fresh investment. In this case, the entry of MNCs will reduce the number of existing firms in the market. Reduction in number of firms in a particular product category means that the market structure for that product is becoming more concentrated. On the other hand, if entry through merger and acquisition is not acquiring big size firms but only small and average size then it can promote competition[39] (WIR, 2000, 2001).

The above discussion made it clear that the both green-field investment and merger and acquisition entry act differently in terms of its short and long run impact on host country market structure. The scope of present study is limited to analyze the impact of green-field investment on host country industrial market structure.

Further, there are two views on the relationship between FDI and emerging market structure in product market. First set of literature, both theoretical and empirical, envisaged that the entry of MNCs will reduce market concentration (Cho, 1990; Caves, 1996; Driffield, 2001; Lundin et al., 2007; see among others). These studies show that the entry of MNCs will increase the number of players in the host market, which will influence the dominant position of the domestic market leader. Consequently, a more competitive market structure will emerge, especially in those industries with high start-up costs and high barriers to entry in the host country. It is so because MNCs are better placed than purely domestic firms in a host country to overcome some of the cost related barriers to entry, through access of global capital resources and the exploitation of ownership advantages, which limit the entry of domestic players in some industries (Cho, 1990; Geroski, 1995). In this sense, one would expect the increase in FDI as an important channel to promote competition (or reduce concentration) and consequently, to (i) improve the quality of product made possible through the availability of modern technology (ii) to enhance the production and productivity of domestic firms through technology spillovers.

[39] As small and average size firms merge with MNCs, they can directly compete with market leader, which was not possible before merger.

Contrary to the above argument, there is a second school of thought comprising of Lall (1979); Cowling and Sugden (1987); Bourlakis (1987); Willmore (1989); Blomstrom et al. (1997); Lall and Streeten (1977), who showed that entry of MNCs would adversely affect the competitive industrial structure of the host country. It is so because MNCs possess some firm specific monopolistic advantages, exclusive knowledge about production methods, managerial skills and international market expertise, which enables them to be in a better position to counter the threat of competition posed by single nation firms (Subramanian and Joseph, 1994; Dunning, et al., 2008). Further, Caves (1996) suggested that the MNC's activities in a particular industry was not only associated with the expected benefits but also linked with the importance of intangible assets in the production process involved in the industry in which they were entering. The intangible assets, such as R &D, foreign brand name etc, help the big firms to get access in new markets through the process of opening up of the economies (Pillai, 1978; Lall, 1979; UNCTAD, 1997)[40].

In similar lines came the work of Dunning (1977, 1988) who suggested the eclectic theory of FDI to explain the rationale of international production by MNCs. He suggested that the multinationals possess monopolistic advantages such as ownership advantage, locational consideration and internalization gains, which are sufficient to compensate for the cost of setting up a new production unit and also to compete with the existing players in the new market.

On the basis of emerging logic from cited literature, it becomes clear that the entry of MNCs may adversely affect the industrial market competition. It is so because MNCs are using various means and methods[41] (some of which may be anti-competitive) along with exclusive knowledge available to MNCs, which facilitates the MNCs to be a dominant player in the market by crowding out local firms which might be small and cost ineffective. In this respect, MNCs will not only act as barriers to entry for new entrants but it will displace the existing producers and consequently imperfect market structure will emerge (Blomstrom, 1986; Blomstrom and Kokko, 1997;

[40] These intangible assets provide comparative advantage over the local firms in the host economy.

[41] Means and methods include predatory price policy, structural barriers and other type of marketing strategies.

UNCTAD, 1997) In this regard UNCTAD (1997) argued that attracting more and more FDI is good for growth process, but what is more important is to maintain the proper functioning (or competition) of market, especially, in those industries where FDI is coming for fuelling growth process.

From the above discussion of the literature, theory suggests that there is no uniform manner in which FDI influences the market structure of nations. In-fact, the impact of FDI on market structure varies across industries and across nations[42]. In a context where in there are theoretical arguments and empirical evidence to support both view points, the issue appears to be context specific and empirical in nature. The present study is an attempt to find out the manner in which FDI influenced the market structure in the context of the India's manufacturing sector.

3.3 Trends of Market Concentration and Foreign Presence

The above discussed literature shows that FDI inflows played a critical role in shaping the market structure of destination country. Furthermore, one can expect that different levels of FDI affect industrial market structure differently. To explore this statement empirically, we divided sales share of MNCs into total product or industrial sales in three classes, namely 'less than 10 per cent' of total sales, share 'between 10 to 50 per cent' of total sales of particular product and sales share 'above 50 per cent' of total product sales (see Table 3.1). Here, the direction of sales share of foreign firms and trends in market structure is analyzed by using three firms concentration ratio.

It is seen from Table 3.1 that the sales share of foreign firms and 3 firms concentration ratio (CR3) display a positive of relationship. As sales share of foreign firms increased the CR3 also increased (Table 3.1). For instance, in 2001-02, as sales share of foreign firms in total sales increased from less than 10 per cent to between 10 and 50 per cent and then to above 50 per cent, where as CR3 also increased from 0.58 to 0.61 and then to 0.83. The same pattern can be seen over different years. Furthermore, the interesting point is to be noted that the concentration ratio have

[42] Firstly, based on the fact that MNCs processes more advanced technology and other cost effective techniques, entry of MNCs will change the existing market structure if domestic firms fail to update their method of production. Secondly, if technology gap between domestic firms and MNCs is sufficiently large enough and further widening then entry of MNCs with advanced technology may displace the domestic firms and consequently monopoly or oligopoly structure can come up.

showed positive trend over the years across different sales share levels. For instance, in 2001-02, when sales share of MNCs was less than 10 per cent, the three firm concentrations was 0.58 which increased to 0.70 in same sales share (less than 10 per cent) range in 2006-07. Similar trend can be seen in other two levels of sales share range over different years. For example, in 2001-02, when sales share of foreign firms was between 10 and 50 per cent, then CR3 was 0.61 which increased to 0.68 in same sales range (between 10 and 50 per cent) in 2006-07. Same is true for above 50 per cent sales share.

Table 3.1: Trends and Patterns of Market Concentration and Sales Share of Foreign Firms

Year	Share of foreign firms in Sales	Average CR3	Average HHI	No. of Products
2001-02	Less than 10	0.58	0.25	64
	10 to 50	0.61	0.24	58
	Above 50	0.79	0.44	10
2002-03	Less than 10	0.60	0.27	63
	10 to 50	0.63	0.22	62
	Above 50	0.80	0.45	7
2003-04	Less than 10	0.62	0.29	64
	10 to 50	0.64	0.24	57
	Above 50	0.82	0.41	11
2004-05	Less than 10	0.65	0.31	59
	10 to 50	0.66	0.25	61
	Above 50	0.82	0.42	12
2005-06	Less than 10	0.67	0.33	56
	10 to 50	0.68	0.26	63
	Above 50	0.80	0.46	13
2006-07	Less than 10	0.70	0.35	59
	10 to 50	0.68	0.29	58
	Above 50	0.84	0.47	15

Source: Compiled from various issues of CMIE, industry, market size and share; CMIE PROWESS.

Alternative concentration index popularly known as Herfindahl-Hirschman Index (HHI) is also calculated. The results obtained from HHI are not much different from

CR3. From HHI, it is seen that as sale share increased from less than 10 per cent to between 10 and 50 per cent, HHI value has declined. But when sales share increased from above 50 per cent HHI also increased. The minor difference in CR3 and HHI may be because both the indexes are based on product level data base. The product level data base is itself a sample data set. If sample coverage is very small then both index may give different trends. Further, it is noted that the HHI values showed upward trend in same sales share level across different years (see Table 3.1). On the whole it observed that higher level of sales share of foreign firms is associated with higher market concentration. Further, the trend in market concentration, over the years, across different sales levels either increased or constant (refer Table 3.1).

With this finding in hand, the next step is to explore the relation between sales share and foreign investment at different technology level[43] (refer to sub-section 1.6.5 in introduction).

The result indicates that the CR3 increased as the sales share of foreign firms shifts from less than 10 per cent to 10 to 50 per cent and above 50 per cent in low, medium low and high technology group, respectively, over the years (see Table 3.2). However, the industries falling in medium high technology range showed that as sales share shifted from less than 10 per cent range to 10 to 50 per cent the concentration level showed declining trends over the years, but as it raised above 50 per cent range the concentration level started increasing. Further, the interesting point to be noted is that the concentration levels increased over time in same sales share class. For example, in 2001-02 (low technology industry), as the sales share value of MNCs less than 10 per cent concentration ration was 0.44 to it increased 0.53 in 2006-07 in same sales share range (less than 10 per cent). Similar trends have observed in other sales share range across different technology group (see Table 3.2). The alternative concentration index, that is, HHI also showed consistent results with three firm concentration ratios.

[43] Studies point out that the widening technology gap between local and foreign firms is a major factor, which prevents local firms from exploiting the spillover gains (Coe and Helpman 1995; Singh, 2006). Foreign firms may crowd out the local firms from market especially as technology gap increases between local and foreign firms.

Table 3.2: Market Concentration and Sales Share of Foreign Firm across Different Technology Levels

Tech. Levels	Sales Share	2001-02			2003-04			2006-07		
		CR3	HHI	No. of Products	CR3	HHI	No. of Products	CR3	HHI	No. of Products
Low tech	Less than 10	0.44	0.22	14	0.47	0.24	15	0.53	0.30	14
	10 to 50	0.64	0.31	12	0.65	0.27	12	0.73	0.33	11
	Above 50	0.84	0.62	3	0.83	0.48	2	0.89	0.51	4
Medium Low tech	Less than 10	0.55	0.20	17	0.62	0.21	18	0.70	0.26	14
	10 to 50	0.56	0.21	11	0.64	0.23	10	0.74	0.27	14
	Above 50	-	-	-	-	-	-	-	-	-
Medium High Tech	Less than 10	0.71	0.31	26	0.75	0.37	24	0.82	0.44	25
	10 to 50	0.63	0.22	33	0.65	0.24	33	0.71	0.30	30
	Above 50	0.82	0.37	7	0.81	0.36	9	0.83	0.46	11
High Tech	Less than 10	0.48	0.16	7	0.59	0.20	8	0.69	0.26	6
	10 to 50	0.64	0.32	2	0.63	0.38	2	0.71	0.27	3
	Above 50	-	-		-	-		-	-	-

Source: Compiled from various issues of CMIE, industry, market size and share; CMIE PROWESS.

The conclusion from Table 3.2 shows that the relationship between sales shares of foreign firms and market concentration is not the same for different technology group and rather it varies across different technology levels. It is also evident from Table 3.1 and 3.2, that FDI and concentration display a positive relationship. It is also important to note that concentration level was very high even though sales share of MNCs is less than 10 percent. It indicated that factors other than FDI may have some role in determining the market structure. On this account, the pertinent question needed empirical verification is the role of FDI in determining market concentration in India's manufacturing industries. Given this argument and evidence from above two tables, the next step is to identify the variables, which has some role in shaping industrial market structure.

3.4 Hypothesis and Variable Construction

(a) Market Structure: Changes in concentration level reflect, what is happening to other structural variables affecting the market power of dominant firms (Muller and Hann, 1974). Here, study used the level of concentration as a dependent variable to see the impact of other variables on market concentration[44]. The most commonly used measure of market concentration is Herfindahl index and Concentration Ratio. Concentration ratio is considered as one among the best available index to measure the degree of oligopoly in the industry. On the other hand, HHI takes in account both the number of firms and the distribution of market share. The present study has made use of the three firm concentration ratio as well as HHI as a measure of market structure.

(b) Foreign Presence[45]: Present study will define the foreign presence as the share of foreign firms to the total sales of the industry (Lall, 1979; Driffield, 2001). On the basis of previous discussion, study assumed a positive association between sales share of MNCs in total sales and market concentration. Both theoretical and empirical literature

[44]See Lall, 1979; Cho, 1990; Driffield, (2001); Beena, (2006); Kambhampati, (1998).

[45] As per IMF definitions, a foreign firm is defined as investment equal to or greater than a 10 percent equity share a single firm.

showed that the MNCs have ownership advantages[46], which gave the MNCs an advantage over single nation firms (Dunning, 1977; Pillai, 1978; Subramanian and Joseph, 1994; Caves, 2007). These ownership advantages and other strategic factors assist the MNCs not only to produce and sell low cost products but also to establish themselves as the leading players in the host country's market. In this sense, entry of MNCs not only put barriers to entry for potential entrants (especially local firms), but also pushes out the existing players in the market through price war and other competitive strategies. As Bain (1956) stated absolute cost advantages and product differentiation work as an entry barriers. On this basis, the expected sign of this coefficient is positive, which indicates that foreign presence and industrial concentration is positively associated.

Foreign Presence = Sales of MNCs / Total Industry sales

(c) Growth Rate of Market/Industry (GRM): Curry and George (1983) and other scholars showed that growth of an industry play an important role in changing the extent of concentration. In the early stage of the life cycle of a product, there are only few producers producing products in the market due to lack of demand and other factors. With the passage of time, if industry starts growing at high rate due to increasing demand of the product, it attracts new producers to enter the market. If it is the successful small firms that grow at a faster rate than that of their competitors[47] then fast entry and successful establishment of new entrants will affect the dominant position of existing large firms and consequently a competitive market structure will emerge. In the Indian context, Ghosh (1975)[48] showed that four firm concentration ratios in Indian industries have decreased in 18 industries and increased only in four industries. He found that growth of the industry was key factor for declining industrial concentration. Amsden and Singh (1993) argued that the decline in industrial concentration in Japan during 1950 to

[46] Ownership advantages include size of MNCs, scale economies in production, marketing and R&D investment, patent, vertical integration etc.

[47] Since large firms may be subjected to certain constraints on their maximum feasibility growth due to their large size (Caves and Porter, 1980).

[48]The period of the study was 1948 to 1968.

1962 was because of high growth of industry size. Contrary to this argument, if existing and large size firms are growing faster in the booming phase of industry than new entrants because existing large firms are in better place to access funds from the market than their counterpart of small and new firms. In this manner, the industrial concentration will further increase in the explosive of industrial growth (Jeong and Masson, 1990; Bhasker, 1992). Thus, the relationship between industry growth rate and market structure is uncertain. It is an empirical issue to explore the relation between industrial growth and changing level of industrial concentration in the expansionary phase of industry.

GRM is defined as the proportionate change in the sales value over the period (Driffield, 2001; Cho, 1990). To overcome the inflationary fluctuation, we deflate the sales value at constant prices for respective years to calculate the annual growth rate of market size in particular industry.

$$GRM = (GMR_{it} - GMR_{it-1}) / GMR_{it-1}$$

(d) Capital Intensity (CI): Capital intensity is another important variable in shaping the host country industrial structure. It is defined as the ratio of fixed assets per employee for each industry. Here, we use capital to output rather than direct capital-labour ratio due to the absence of information on number of labour or labour time employed in the data-set used for the study. Number of studies, namely (Newfarmer and Marsh, 1981; Lall and Mohammad, 1983; Subramanian and Joseph 1994), used capital output ratio as a proxy of capital intensity. Capital intensity will tell us about the choice of technique of the firm. Higher capital intensity may create barriers to entry for potential entrants which cannot raise the minimum amount of capital necessary for efficient production (Lall, 1979, Driffield, 2001). On this basis, one can expect positive association between capital intensity and market concentration. On the other hand, the empirical study by Cho (1990) revealed the negative association between capital intensity and industrial concentration. Here, we will explore the impact of this variable in determining the concentration level in Indian manufacture. The expected sign of this variable is positive.

$$Capital\ Intensity = Capital\ Employed / Total\ Output$$

(e) Import Intensity: Among other determinants of market structure, import competition plays a decisive role in shaping the industrial structure for a liberalized economy. This variable is a part of trade openness. As trade theorists argued, if economy is open to market forces then market players themselves bring competitive outcomes. But the empirical literature, in this line was inconclusive. The study by Krishna and Mitra (1998) tested the impact of trade openness on mark-up for some industries in Indian manufacturing sector. The results visualized that the mark-up has declined in a sample of industries during post reform period except in electronic machine industry. Contrary to previous estimates, the study by Pant et al., (2005) used Lerner index to examine the impact of trade liberalization on India's manufacturing industries. The results showed that the mark-up in general increased in most of the industries in second half of reforms, which indicated that openness did not bring competitive outcome. Further, one can argue that the trade liberalization has positive impact on competition because increasing inflows of import generates pressure on existing sellers' to improve the competiveness, efficiency and quality of their products to survive in the market for long period. Subsequently, concentration will reduce. On the other hand, if existing sellers are not in a position to improve efficiency along with quality of the product the low cost import may displace inefficient producers from market and results in the majority market share being captured by importing firms and some big domestic firms, thereby concentration will increase with trade liberalization. In the context of on-going debate, there is a need to revisit and check this relationship in Indian context. The expected sign of the coefficient for this variable is positive.

Import Intensity = Industry Imports / Total Industry Sales

(f) Export Intensity: Export Intensity is an important variable in determining the changing level of concentration in the context of a liberalized economy. As the economy opened for trade, exports help the existing firms to exploit economies of scale even when domestic demand does not allow to do so. In this case, more and more firms will realize minimum efficient point of cost curve. As more firms are operating with one product line, they will not only improve the product quality but also reduce their cost of production to

access market from other nations. In this way, exports can help in reducing concentration. On the other hand, if export demand is more elastic than domestic demand, then an expansion of export will cause an increase in domestic prices and export may become associated with monopoly gain because of lack of competitiveness of new comers (Bourlakis (1987); Pant et. al. (2005); Basant and saha (2005[49]). We will capture the impact of exports by calculating the export intensity, that is, share of exports in total sales of a product or industry. Basant and Saha (2005) also calculated export intensity to capture the impact of exports on entry barriers. On the basis of literature and findings from the second chapter, we are expecting negative sign of this coefficient.

Export Intensity = Exports of the Industry/ Total Sales

(g) Vertical Integration: This variable indicates the forward and backward linkages of the firms or an industry operating in the market. Vertical integration facilitates the firms to ensure the market of final products and to be cost effective by internalizing the inputs market uncertainty (or market imperfections). Most of the MNCs have this type of advantage, which contributes to them becoming successful producers in the world economy. In this respect, new firms face barriers arising out of cost inefficiencies in case of entering vertically integrated industry (Basant and Saha, 2005). It means vertical integration is associated with market concentration. Contrary to preceding argument, Teece (1985) made his point that vertical integration is seen as a response to market failure. In this case, FDI facilitate foreign firms' entry and reduce market concentration. Further, Caves (1996) suggested that vertical integration of foreign firms would have positive effect on increasing competition in destination country because vertical integration reduces the risk of market failure by internalizing market risk. However, it is an empirical issue to explore the exact relation between vertical integration and changing market structure. For empirical analysis, vertical integration is calculated as follows:

Vertical Integration = Gross Value Added/ Total Sales

[49] Basant and Saha (2005) showed that export orientation does not have significant impact to attract any type of entrant, namely existing and new comers.

(h) Marketing Intensity: Market intensity is part of sunk cost. High sunk cost can act as a barrier to entry (Sutton 1991, 1998). MNCs are spending huge money for market intensity to make product differentiation[50] because of its important role in determining the market power of the firms. As firms make their product unique, the demand elasticity of the product will decrease. This will provide discretionary power to the firms to decide price as well as barriers to entry for new and existing substitutes to enter in that product line. Furthermore, marketing strategy in some firms is so powerful to maintain their share in the market. On the other hand, some empirical studies inferred that advertisement reduced market concentration. It is so because advertisement can improve consumer awareness about product alternatives and prices, which helps to promote perfect competition. In addition, advertisement can be seen to encourage entry by allowing new firms and small firms to advertise their presence to potential consumers (Kambhampati, 1996; Atherya and Kapur 2006). Therefore, the predicted relationship between marketing intensity and entry barriers is not certain. Marketing intensity for a firm can be computed as the ratio of expenditure on advertisement and selling including distributional expenditure and promotional expenditure to total firm sales[51].

Marketing Intensity = Marketing Expenditure / Total Sales

(i) Innovative Efforts: it includes both in-house research and development (R&D) along with technology purchased from outside both in terms of embodied and disembodied technology. It can be captured as the share of expenditure on innovation to total sales. As Schumpeter hypothesized, firms are investing more and more for innovation to obtain exclusive knowledge and further to get monopoly power and economic profits. Orr, (1974); Sutton, (1991) and Driffield (2001) showed that research and development intensity worked as barriers to entry for new entrants in the industry. It is important to take this as a variable because after nineties most of the restrictions on technology

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[50] Dolton & Hamm, 1974; Athreye & Kapur, 2006; used market intensity as a proxy of product differentiation as well as barriers to entry.

[51] Marketing intensity for an industry is defined as the sum of expenditure on advertisement and other selling activities by all the firms in the industries to total industry sales.

imports have been removed. Therefore, an increasing number of firms are importing technology. This combined with the MNCs possessing modern technology poses barriers for new entrants in the market and consequently promote market concentration. The expected sign is positive.

Innovative Efforts = Expenditure on Innovation / Total Sales

(j) Rate of Return to Capital Employed (ROCE): It gives the efficiency with which capital is utilized to generate profits. The decision of entry and exist is influenced by the performance of the industry (Siegfried and Evans, 1994). They explored that expected profitability of the firms attract new entrants. Theoretical and empirical literature clearly pointed out that the profitability is positively related to market concentration for an industry[52]. It means highly concentrated industries generate more profits. In this context, we expect positive sign of the coefficient. For empirical analysis, this variable is defined as the proportion of profit before interest and tax divided by the amount of capital (Beena, 2006; Basant and Saha, 2005).

ROCE = PBIT/Capital Employed

Here,

PBIT = Profit before Interest and Tax

(k) Scale Economies: Scale economy may impede entry if potential entrants must enter with large output in order to take advantages of scale economies. The empirical studies on scale economies have reported varying results. Orr (1974) found that economies of scale work as barriers to entry in Canadian manufacturing industries. Contrary to this, Jeong and Masson (1990) found no evidence of scale economy barriers[53]. In this sense, it is important to analyze the impact of scale economies in the relation between entry barriers and market concentration. This variable is calculated as the average size of the

[52] See Beena (2004) and Basant, et al. (2005).

[53] They explained the case of potential entrants like using the following analogy. Explain their point of climbing tall mountain (They argued that small firms tried their best to achieve scale economies).

largest firms accounting for 50% of a sector's total assets expressed as a percentage of total sector assets (Lall, 1979; Bourlakis, 1987).

Scale Economies = Average Size of the Largest Firms Accounting for 50% of a Sector's Total Assets / Total Sector Assets

3.4.1 Empirical Methodology

In our model, we have selected ten variables that played key role in shaping the industrial market structure in a liberalized economy. These variables covered trade, structural and strategic variables. The period of analysis is from 2001-02 to 2006-07. Further, the selection of the study period is based on the availability of foreign direct investment data from CMIE PROWESS. For our analysis, we selected 12 manufacturing industries.[54] (see methodology section of chapter one).

Model I

$$CR3_{it} = \alpha + \beta_1 FS_{it} + \beta_2 MI_{it} + \beta_3 EI_{it} + \beta_4 VI_{it} + \beta_5 CI_{it} + \beta_6 MKTI_{it} + \beta_7 IE_{it} + \beta_8 ROCE_{it} + \beta_9 SE_{it} + \beta_9 GRM_{it} + U_{it}$$

Model 2

$$HHI_{it} = \alpha + \beta_1 FS_{it} + \beta_2 MI_{it} + \beta_3 EI_{it} + \beta_4 VI_{it} + \beta_5 CI_{it} + \beta_6 MKTI_{it} + \beta_7 IE_{it} + \beta_8 ROCE_{it} + \beta_9 SE_{it} + \beta_9 GRM_{it} + U_{it}$$

Where

$CR3_{it}$ = Three Firms Concentration Ratio in i_{th} Product t time period

HHI_{it} = Herfindahl-Hirschman Index in i_{th} Product t time period

Independent Variables are as follows

FS_{it} =Sales Share of Foreign Firms in i_{th} Product t time period

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[54] See the section on methodology in chapter 1.

MI_{it} = Import intensity in i_{th} Product t time period

EI_{it} = Import Intensity in i_{th} Product t time period

VI_{it} = Vertical Integration in i_{th} Product t time period

CI_{it}. = Capital Intensity in i_{th} Product t time period

$MKTI_{it}$ = Marketing Intensity in i_{th} Product t time period

IE_{it} = Innovative Efforts in i_{th} Product t time period

$ROCE_{it}$ = Rate of Returns to Capital Employed in i_{th} Product t time period

SE_{it} = Scale Economies in i_{th} Product t time period

GRM_{it} = Growth rate of the market in i_{th} Product t time period

β's = Coefficient of Variables

α = Constant Term

U_{it} = Error Term

Table 3.3: Summary Statistics of Variables used for Analysis

Variables	Observation	Mean	Std. Dev.	Min	Max
CR3	1242	0.651	0.267	0.010	1.000
FS	1248	0.127	0.179	0.000	0.860
MI	1242	0.298	0.880	0.000	13.138
EI	1242	0.260	0.635	0.000	6.130
VI	1248	0.194	0.093	-0.169	1.524
CI	1248	0.767	0.437	0.053	3.145
MKTI	1248	0.057	0.037	0.001	0.238
II	1248	0.019	0.028	0.000	0.462
ROCE	1248	0.239	1.547	-1.155	54.160
SE	1248	2.737	14.743	0.074	1.000
GRM	1248	0.055	0.186	-0.543	1.994

Source: Own calculation using CMIE Prowess.

Before presenting the estimations and results, the study presented the summary statistics in Table 3.3 for understanding the behavior of variables. Further, to check the presence of multicollinearity, the simple correlation matrix has been estimated (see Table 3.4). The simple correlation coefficient between foreign presence and CR3 is found to be 0.17 with positive sign. In general, the correlation coefficient across all the independent variables is observed to be not very high. The correlation coefficient between import and export intensity is 0.36, which is the highest among all the variables. This ensures that the problem of multicollinearity doesn't pose a major challenge.

Table 3.4: Correlation Matrix of Selected Variables for Analysis

Variables	CR3	FS	MI	EI	VI	CI	MKTI	IE	ROCE	SE	GRM
CR3	1.000										
FS	0.169*	1.000									
MI	0.112*	-0.078*	1.000								
EI	-0.123*	-0.084*	0.363*	1.000							
VI	0.051	0.125*	-0.116*	-0.048	1.000						
CI	0.059	-0.113*	0.017	-0.076*	0.291*	1.000					
MKTI	-0.021	0.029	-0.083*	-0.064	0.051	-0.053	1.000				
IE	-0.055	0.150*	-0.018	-0.024	0.133*	0.079*	0.054	1.000			
ROCE	0.052	-0.003	0.034	-0.010	0.299*	0.039	-0.020	-0.015	1.000		
SE	0.070	-0.108*	-0.002	0.024	-0.013	0.081*	0.044	-0.060	-0.006	1.000	
GRM	0.128*	0.019	-0.046	-0.020	0.022	-0.072	-0.091*	-0.010	-0.008	-0.023	1.000

*Note: * Indicates significant at 1 percent.*

3.4.2 Regression Results

The study conducts analysis in a panel regression using balanced panel for 1241 observations. The logic behind selection of panel technique is that it provides more information, more variability, more degree of freedom, less co linearity, covers both spatial and temporal dimensions ordering of data and acts as a control for individual unobserved heterogeneity. In panel regression we have different type of modeling, namely constant coefficient (or pooled regression) model, fixed effect models and random effect model. For empirical analysis, study will select one model through various econometric specifications.

The study started panel analysis with pooled ordinary least squares (OLS) regression. But pooled regression can bias the empirical results upwards if significant cross-section or time fixed-effect are present (Baltagi, 2008). To overcome this problem, study used Breusch and Pagan Lagrangian multiplier test to identify whether pooled regression is consistent or not. The estimated result of this test produces χ^2= 2298.51 which is statistically significant. It indicates that pooled regression is not an appropriate econometric technique for our data set. But this test does not tell that whether fixed effect or random effect model is consistent from panel models. Therefore, the study used Hausman specification test which helps us to select the fixed or random effect model. The Hausman specification test verify more consistent model against less consistent because the consistent model ensures robust and reliable results (Baltagi, 2008). As per Hausman test, if probability value is significant, that is, Prob> chi2 less than 0.05 then fixed effect model will produce more reliable results. If p value is insignificant, that is, prob > chi2 greater than 0.05, then it is better to use random effect model for econometric analysis. In present study, the Hausman specification result gives prob > chi2 less than 0.05, which allows us to use fixed effect model for analysis (refer Table 3.5).

Table 3.5: Market Concentration and FDI: Estimation Results

Dependent Variable: CR3			
Independent Variables	**Pooled OLS with Robust Estimation**	**Fixed Effect Model**	**Random Effect Model**
	Co-efficient (t-value)	**Co-efficient (t-value)**	**Co-efficient (z-value)**
Foreign Presence	0.287 (9.17)***	0.249 (4.42)***	0.259 (5.91)***
Import Intensity	0.059 (9.18)***	0.008 (1.28)	0.013 (2.23)**
Export Intensity	-0.073 (-7.94)***	0.091 (5.18)***	0.062 (3.99)***
Vertical Integration	0.061 (0.75)	-0.007 (-0.17)	0.002 (0.05)
Capital Intensity	0.039 (2.22)**	-0.112 (-5.97)***	-0.097 (-5.29)***
Marketing Intensity	-0.039 (-0.20)	0.413 (1.34)	0.341 (1.27)
Innovative efforts	-0.789 (-3.97)***	0.674 (5.17)***	0.608 (3.90)***
ROCE	0.006 (3.24)***	0.004 (3.81)***	0.004 (3.19)***
Scale Economies	0.002 (2.85)***	-0.001 (-1.52)	-0.000 (-1.13)
Growth of Market	0.194 (4.15)***	0.049 (2.34)**	0.052 (2.37)**
Constant	0.575 (22.59)***	0.640 (26.47)***	0.637 (22.64)***
No. of Observations	1241	1241	1241
F Statistics	27.79	18.16	
Prob > F	0.000	0.000	0.000
Wald chi	-	-	161.25
Lagrangian multiplier test			χ^2=2298.51 (p=0.000)
Hausman Specification Test	-	χ^2=30.06 (p = 0.001)	
R^2	0.110	0.226	0.223

*Note: (i) *, ** and *** represent significant level at 10 percent, 5 percent and 1 percent respectively.*
(ii)The figure in brackets represents the t and z values.
Source: Compiled from various issues of CMIE, industry, market size and share; CMIE PROWESS.

The results obtained from three models are shown in Table 3.5. The overall model significant value can be seen from F – values for OLS and fixed effect model and Wald Chi square values for random effect. In our case, all the three models show significant F and Wald Chi square values. Finally, study selected fixed effect model through various specifications. The explanatory power of the model is 0.23 for fixed effect model, which is quite satisfactory in case of panel analysis.

As per the study hypothesis, foreign presence turns out to be a positive and significant determinant of market concentration. It envisaged that unit change in foreign sales share led to an effective change of 0.249 units in concentration ratio. This result is in line with most of the existing studies (Lall, 1979; Wilmore, 1989; Blomstrom, 1986; Braunerhjelm et. al., 1998; Peria and Mody, 2004). Crowling and Sugden (1987) argued that the entry of MNCs acted to displace the domestic producers by various marketing strategies and consequently led to market concentration.

Other than foreign presence, export intensity, innovative efforts of the firms, rate of return to capital employed (ROCE) and growth of market were also emerged as significant determinants of industrial concentration in the reform period. They all confirmed a positive relation with market concentration.

The export intensity had a positive and significant impact in shaping the market concentration. The possible explanation is that, in a liberalized economy, domestic market demand is no longer a constraint for the producer. Export enables the domestic producers to sell their product in both national and international market to access the minimum average cost point. In this case, the exporting firms improve their product quality as well as become cost effective, which causes barriers to entry for new entrants and cost ineffective existing firms turning out of market and consequently alter the existing market structure. Number of studies (Bourlakis, 1987; Pant et al., 2006) showed positive impact of export and openness on market concentration. Further, the innovative effort turns out to be positive and significant, at one percent level. Our results are in line with the existing studies. The study by Dunning (1977) and Caves (1996, 2007) argued that high innovative capacity of the firms gave inclusive knowledge for production

method and it is also resulted in increasing market concentration by working as an entry barriers. Since new entrants found it difficult to undertake that much financial investment to carry out innovations resulting in them not able to stand up-to the highly innovative firms when it came to market competition.

The profitability variable namely rate of return to capital employed emerged as significant with positive sign. It indicated that high concentration generates higher level of profits. This is so because market concentration gives the right to the firms either to decide their price or output level to maximize their profits. This finding confirmed with literature (Mann, 1966; Beena, 2004).

The growth rate of market also showed positive and significant relation with industrial concentration. In this context, the possible argument is that in the expansionary phase of industrial growth, the dominant or existing players are growing faster rate than the small and potential entrance in growing industry. It means the dominant players continue to retain their leading position in the industry. Existing literature did not provide clear relation between the impacts of growth rate of industry and market concentration. Our finding confirms with some of the existing studies (Lall, 1979; Jeong and Masson, 1991).

Furthermore, the explanatory variable namely capital intensity turns out to be significant, at one percent level, with negative coefficient sign. It indicated the negative association between industrial concentration and capital intensity. It is so because in a liberalized economy, producers can raise capital both from domestic as well as from international capital market. As a result, capital intensity is no longer an entry barrier for potential entrants in the market.

Other independent variables such as import intensity, marketing intensity, scale economies and vertical integration have shown no significant relationship with market concentration. But the variable such as market intensity appeared with positive sign which is as per our expectation. The positive sign indicated the positive association between marketing intensity on concentration. This may be because firms are using various marketing strategies to establish their product in the market as well as to

differentiate (or make inelastic demand) their product demand from other available substitutes of that product in the market. Sutton (1991, 1998) explored that the marketing intensity raise entry barriers for new entrance in the highly advertising product market. In this line, import appears with positive sign, it means import intensity have positive impact on market concentration. It occurs because the import can displace the small and cost ineffective domestic firms from market by selling product at lower price. As displacement taken place, the number of firms will decline and give birth to oligopoly or monopoly market structure.

Other two variables namely scale economy and vertical integration appeared with negative sign of the coefficient, it means the negative relationship between industrial concentration and scale economies. But both are insignificant.

To confirm our findings, the alternative concentration index known as HHI is used as a dependent variable. The results showed by HHI did not differ much from CR3 except some coefficient sign (see Table 3.6). The sign difference is seen in case of marketing intensity and vertical integration. But both the variables are insignificant in both the models.

Table 3.6: Estimation of Determinants of Concentration with Fixed Effects

Independent Variables	Fixed Effects with CR3 as Dependent Variable	Fixed Effects with HHI as Dependent Variable
	Co-efficient (t-value)	Co-efficient (t-value)
Foreign Presence	0.249 (4.42)***	0.078 (1.46)
Import Intensity	0.008 (1.28)	0.018 (1.87)*
Export Intensity	0.091 (5.18)***	0.042 (3.50)***
Vertical Integration	-0.007 (-0.17)	0.085 (1.52)
Capital Intensity	-0.112 (-5.97)***	-0.028 (-1.57)
Marketing Intensity	0.413 (1.34)	0.041 (0.21)
Innovative Efforts	0.674 (5.17)***	0.559 (4.58)***
ROCE	0.004 (3.81)***	0.001 (0.97)
Scale Economies	-0.001 (-1.52)	0.001 (2.15)**
Growth of Market	0.049 (2.34)**	0.053 (3.60)***
Constant	0.640 (26.47)***	0.254 (13.10)***
Number of Observations	1241	1241
F Statistics	18.16	9.32
Prob > F	0.000	0.000
R^2	0.226	0.103

Note: (i) *, ** and *** represent significant level at 10 percent, 5 percent and 1 percent respectively. (ii)The figure in brackets represents the t and z values.
Source: Compiled from various issues of CMIE, industry, market size and share; CMIE PROWESS.

In line with the stated objective, the present study further carry out panel regression analysis at technology levels. This is because competitiveness crucially depends upon the technology dynamics of the firms. The high technology firms are more innovative and can learn easily through diffusion from more advance firms. In this context, entry of

MNCs will enhance competition because high technologies firms will improve their production structure according to rivals' strategies. In this process technology gap between local and MNCs will come down. Consequently, concentration will further reduce (or market structure will approach to perfect competition).

With this logic, study tests the above noted relationship between FDI and market structure across various technology group. The analysis seeks to find out the answer to the query as to whether the impact of entry of MNCs on industrial market concentration differ as level of technology change.

Table 3.7 depicted panel regression results on the basis of OECD (2007) technology classification. It can be seen from Table 3.7 that the FDI have positive impact on market concentration across different technology levels, it is also significant for all technology level except medium low technology industry. Interestingly, the point to be noted is that the impact of FDI is not same for all technology levels. It seems very strong in case of medium high technology group and weak in case of medium low technology group.

Among other control variables, import intensity also revealed positive sign (both in general and technology specific analysis). Interestingly, import intensity turned as a significant variable in high technology and medium low technology group. The sign of import intensity is consistent with general findings. Further, export also showed significant impact on market concentration across technology levels, which is consistent with previous results (general regression analysis). But export has showed negative sign in high technology group, which means as export increases concentration will come down. It may be because in high technology product huge investment is required to access minimum efficient point of production.

In a closed economy, due to small market size only few firms can operate at minimum efficient point. In the liberalization period, export from India in high technology product

has increased[55]; that helped new and existing firms to access minimum efficient point and subsequently reduced market concentration.

Further, vertical integration does not show any change (both in general and technology specific analysis), except in low technology industry. But interesting point is to be noted that vertical integration emerges with significant negative sign. That is contrary with existing literature (Basant et al., 2005). The possible explanation for this is that the vertical integration prevents market failure (Teece, 1985). Following Teece (1985), Caves (1996) suggested that vertical integration of foreign firms would have positive effect on increasing competition in destination country because vertical integration reduces the risk of market failure by internalizing market risk. As market works efficiently, concentration will automatically reduce (or concentration market structure will no longer operate especially when market works properly). Further, capital intensity showed consistent sign both at different technology levels and without technology classification except high technology. But the impact of capital intensity is significant only in case of medium high technology and low technology group industries. The negative sign express inverse relationship between concentration and capital intensity. It is because, in a liberalized economy, capital is no longer act as barrier to entry, particularly because firm can raise capital from any part of the world economy.

The explanatory variables of the regression model such as rate of returns to capital employed, innovative efforts and marketing intensity seems to play a pivotal role in determining market concentration. The innovative efforts of the firms and rate of return to capital employed revealed consistent sign with general analysis. But marketing intensity showed negative (opposite to general analysis) sign but insignificant in case of medium low technology group. Further, scale economies works as a barriers to entry only in case of high technology group. It may be because scale economies need huge production with high start up cost in high technology group (as discussed for export variable). These conditions operate as entry barriers for potential entrants. Growth of

[55] See, Kumar et al., 2008.

market size showed consistent result with previous (general regression) analysis. Only, low technology group showed negative sign, but it turned statistically insignificant variables.

Table 3.7: Estimation of Determinants of Concentration with Different Technology Level with Fixed Effect

Independent Variables	High Technology	Medium High Technology	Medium Low Technology	Low Technology
	Co-efficient (t-value)	Co-efficient (t-value)	Co-efficient (t-value)	Co-efficient (t-value)
Foreign Presence	0.619 (1.81)*	0.278 (4.30)***	0.157 (1.12)	0.214 (1.65)*
Import Intensity	0.183 (3.20)***	0.005 (0.84)	0.029 (0.05)**	0.082 (1.36)
Export Intensity	-0.224 (-1.67)*	0.087 (2.57)**	0.085 (3.10)***	0.093 (3.52)***
Vertical Integration	-0.079 (-1.04)	-0.055 (-0.93)	-0.583 (-3.43)***	0.044 (0.34)
Capital Intensity	0.003 (0.03)	-0.074 (-3.34)***	-0.022 (-0.74)	-0.204 (-4.85)***
Marketing Intensity	1.112 (0.69)	0.699 (1.99)**	-0.896 (-1.39)	0.672 (1.30)
Innovative Efforts	0.112 (0.16)	0.802 (2.21)**	0.509 (2.41)**	0.627 (1.99)**
ROCE	0.001 (0.66)	0.035 (2.01)**	0.326 (4.02)***	0.019 (0.56)
Scale Economies	0.254 (1.84)*	-0.001 (-1.39)	-0.164 (-1.88)*	-0.000 (-0.35)
Growth of Market	0.083 (1.04)	0.065 (3.07)***	0.074 (1.81)*	-0.007 (-0.16)
Constant	0.287 (2.26)**	0.682 (25.11)***	0.724 (10.32)***	0.582 (11.15)***
No. of Observations	60	611	234	336
F Statistics	4.59	7.89	9.59	15.21
Prob > F	0.002	0.000	0.000	0.000
R^2	0.471	0.193	0.407	0.352

Note: (i) *, ** and *** represent significant level at 10 percent, 5 percent and 1 percent respectively.
(ii) The figure in brackets represents the t and z values.
Source: Compiled from various issues of CMIE, industry, market size and share; CMIE PROWESS.

From technology specific analysis, it is clear that variable selected for regression model in present study behave differently across technology levels. It means that level of technology played an important role in determining the market structure.

3.5 Summary of Findings

This chapter analyzed the role of foreign direct investment in determining the market structure in the light of liberalized investment policy. The reforms led to the entry of several MNCs in Indian industries, which has had significant implications on the market structure, as discussed in the empirical literature (Cho, 1990; Pillai, 1978; Lall, 1979; among others). The present chapter tested this relation in Indian manufacturing industries. To explore the relation, study examined the trends of sales share of foreign firms and concentration ratio. Study used panel regression analysis by considering concentration as dependent variables and FDI along with other control variables as explanatory variables. Further, the regression analysis was carried out both in general and specific technology groups. Main findings of this chapter are summarized as below:

(i) In general, the sales share of foreign firms showed positive relationship with industrial concentration over the study period. It indicates that as sales share shifted from less than 10 percent to between 10 and 50 percent and further to above 50 percent, concentration level will also increased.

(ii) The detailed exploration of trends of foreign presence and industrial concentration across different technology also verified that as sales share of foreign firms increases the concentration level also increases except in the case of medium low industries group.

(iii) The regression findings confirmed the hypothesis that FDI tends to have the effect of making the industrial structure more concentrated. In addition to foreign presence, the other factors like innovation intensity, export intensity, growth of market and rate of return to capital employed also have significant and positive impact on market concentration. Other explanatory variable such as capital intensity showed significant negative impact on concentration. The variables like

import intensity, vertical integration, marketing intensity and scale economies, did not show significant impact on industrial concentration.

(iv) From technology specific regression analysis, evidence indicated that foreign presence has significant positive impact in determining the market concentration, except in medium low technology group. In high technology group other variables like import intensity (positive sign) and export intensity (negative sign) have emerged as significant determinants of market concentration. In medium high technology group, other variables having significant impact on industrial concentration are export intensity (positive sign), marketing intensity (positive sign), innovative intensity (positive sign), capital intensity (negative sign), rate of return to capital employed (positive sign), growth of market size (positive sign). Similarly, import intensity (positive sign), export intensity (positive sign), vertical integration (negative sign), rate or return to capital employed (positive sign), innovative intensity (positive sign) scale economies (positive sign), growth of market (positive sign) can be seen as significant determinant of industrial concentration in medium low technology group. Export intensity (positive sign), capital intensity (negative sign) and innovative intensity (positive sign) played significant role in shaping the industrial market structure for low technology group.

CHAPTER IV

SUMMARYAND CONCLUSION

The present study broadly tried to examine the impact of foreign investment on market concentration with special reference to India's manufacturing industries during the post reform period. The specific objectives of the study were: first, to understand the emerging trends in market structure in Indian manufacturing sector against the backdrop of liberalized trade and investment policies; and second, to analyze the influence of foreign investment on market structure in the manufacturing sector. The concentration levels were determined both in general (together for all industries) as well as at industry level. Further, study divided different industries on the basis of their technology levels (OECD, 2007, technology classifications). The empirical finding throws-up some light (or indications) on the transformation of industrial structure in the light of economic reforms undertaken in mid-1980 and afterward. However, the empirical findings need to be understood in the light of the limitation and paucity of data.

The trends of FDI are as follows: firstly, FDI as proportion to gross domestic product has increased rapidly during reform period. Secondly, ratio of realization of FDI to total approvals also increased, but realization of FDI has increased more sharply in post 1996-97 and finally, the compound growth rate of FDI is also found positive across all industries, which meant FDI inflows increased during reform period. The existing literature also showed that FDI inflows have increased during reform period (Rajan et al., 2008; Singh, 2007; Naik, 2006; Virmani, 2004). They argued that the sudden rise in FDI inflows was the result of the liberalization of India's highly regulated FDI policy and other structural factors such as market size, quality of infrastructure, tax concession, among others. The setting up of Foreign Investment and Promotion Board and Foreign Investment Implementation Authority contributed to quick translation of FDI approvals into actual realization of FDI inflow (Naik, 2006).

Further, the trends of market concentration were calculated on the basis of N-firms concentration ratio (N=3). The concentrations trends, in general, revealed that market concentration has increased in the liberalization period. This meant that policy relaxation did not dilute market power of leading firms. The study by Balakrishna et al. (2002); Pant et al. (2005); Subramanian (2005); Pushpangadan et al. (2008) also observed that economic reforms induced market concentration in Indian manufacturing industries.

To confirm this general finding, the present study explored the issue in detail at the industry level and also by considering the technological intensity of the industry concerned (OECD, 2007, technology classifications). The industry specific exercise confirmed the observation found in general analysis. However, the trends of concentration varied from industry to industry. From industry specific analysis, two types of concentration trend have emerged: first, industries belonging to low technology (except textiles, textiles products, leather and footwear) and medium low technology industries and high technology (only radio, TV and communications equipment industry) indicated a reduction in concentration in the early years of economic reforms followed by an increase since 2001-02. The possible reason for this type of concentration trends can be explained with type of investment happening in the economy (Joseph, 1997). Instead of competing directly with local market players, MNCs entered into collaboration with local firms. It made easy for MNCs to set their industrial base in new market. Over time, MNCs overtook some local firms (especially collaborated firms) and pushed other weaker firms out of the market by using various marketing strategies (predatory prices, high advertisement, etc.) along with exclusive knowledge about production methods. This process enabled the MNCs to capture the host country market.

Second, industries belonging to medium high and high technologies industries (except TV and communications equipment industry) low technology (only textiles, textiles products, leather and footwear) showed straight upward trend of market concentration. It can be attributed to the removal of restrictions on trade and investment. As economy is open for trade and FDI, the competitive enterprise can expand their production activities though export or though investment in other nations. In this respect, the existing market

leaders are in better place to expand their production activities because they have easy access to financial and other essential inputs which may not be available for potential entrants due to market imperfection (Basant and Saha, 2005; Bhaskar, 1992). Further, it was also observed that the number of firms declined in the recent years (especially since 2001-02) across all industry groups[56]. The theory of market structure would interpret such a situation as a market structure acquiring oligopolistic characteristics. The study by Subramanian (2005) argued that the number of firms increased in the early period of reform due to lowering of entry barriers. But the entry of foreign firms though collaboration with existing market leaders pushed the unviable firms from market.

On the whole, it is clear that concentration increased over the reform period. The increasing trend of market concentration, if allowed to continue, could lead to a situation where liberalization of trade and investment policy becomes an instrument of aggravating rather than reducing concentration. However, from a static perspective, the increasing concentration has further implications on consumer welfare through price mechanism. Concentration may develop collusion among enterprise and enable them to charge high prices than competitive prices.

Further, the relationship between market concentration and the presence of foreign firms (sales share of foreign firms has been taken as the proxy of foreign presence) were analyzed by using both descriptive statistics and econometric models. To explore this relationship, the sales share of foreign firms was divided into three ranges (a) less than 10 per cent sales (b) between 10 and 50 per cent and (c) above 50 per cent and then correspondingly analyzed the concentration trends over the years in each range. Findings suggested that as sales share of foreign firms increased from less than 10 per cent to between 10 and 50 per cent and above 50 per cent concentration ratio also increased. Same trends have been observed across different years. In addition, the technology specific analysis showed that the sales share of foreign firms and market concentration had a positive relation except in the case of medium high technology group industries.

[56] It is worth noting that CMIE is a sample data base.

Medium high technology group showed U shape relation between sales share of foreign firms and concentration ratio over the study period. That is, as sales share of foreign firms increased from less than 10 per cent to between 10 and 50 per cent then concentration showed some decline, but as sales share increased to above 50 per cent then concentration trends again revived. It indicated that FDI did influence market concentration. On the basis of trends and patterns alone, it is difficult to judge the strength of this relationship.

To test whether FDI has had a strong influence over the market concentration in India's manufacturing sector, the study also tried to analyze the factors contributing to change in industrial concentration during liberalization period. The panel regression technique was used for examining the determinants of market concentration. Study incorporated foreign presence, trade variables (includes import and export), strategic variables (marketing intensity, innovative efforts), structural variables (scale economies, growth of market, capital intensity), rate of return to capital employed and vertical integration as explanatory variables in the regression model.

Results of the regression analysis reported that MNCs played an important role in determining the industrial market concentration. Foreign presence turned as positive and significant variable of market concentration and this finding is consistent with existing empirical studies (Lall, 1979; Pillai, 1978; Willmore, 1989; Yun, 2001. The reason behind this is that MNCs are firms with enormous size and strength. The ownership-specific advantages of MNCs (which includes advance technologies, management know-how skills, transaction cost minimizing and other intangible resources) enable the MNCs to transfer existing market structure into oligopoly or monopoly market and subsequently enjoy economic profits (Hymer, 1966; Dunning, 1981). Similarly, the trade variables (includes imports and exports) expressed positive impact on concentration. But, export indicated statistically significant impact on concentration and import turned out to be insignificant. This may be due to the fact that market competitive power of exporting firms facilitates the MNCs to sustain their market position over time. The result of

present study is consistent with Pant et al. (2005); Balakrishna et al. (2002); and Bourlakis (1987).

Further, the present study found capital intensity as a significant determinant of market concentration with negative sign. It showed inverse relationship between industrial concentration and capital intensity. This is so because capital is no longer a serious constraint in a liberalized economy. As economy is liberalized, competitive firms can raise funds from any part of the world. The other explanatory variables namely, rate of return to capital employed, innovative efforts and growth of market indicated the positive association with market concentration. These evidences are in line with most of theoretical and empirical literature[57]. The present study also observed the influence of vertical integration, import intensity, marketing intensity and scale economies as determinants of market concentration. All four variables showed insignificant impact on market concentration.

Similarly, panel regression exercise was carried for selected industries classified according to different technology levels (for details see methodological section in chapter one). The present study also analyzed the impact of FDI on market structure across different technology levels. The technology specific findings further confirmed that FDI acted as an important determinant of market concentration across technology groups in India. In addition, import intensity showed a relationship that is consistent (positive) sign with general regression findings. The other trade variable, exports showed significant impact on concentration. But, in case of high technology group, the relation was negative. It might be because in high technology category, huge investment is needed to access minimum efficient point of production. In a closed economy, due to small market size only few firms were accessing minimum efficient point. During liberalization period, export of high technology industry increased from India (see, Kumar, *et. al.*, 2008). Due to high export, more firms can access minimum efficient point, which reduces market concentration. Further, vertical integration did not show any change (both in general and

[57] See Lall (1979); Cho (1990); Sutton (1991, 1998); Driffield (2001).

technology specific analysis), except low technology industry (it is insignificant). But interesting point to note is that vertical integration emerged with significant negative sign in medium low technology industry. This is contrary for existing literature (Basant et. al, 2005). The possible reason for this is that the vertical integration prevents market failure (Teece, 1985). As market works properly, concentration will automatically reduce. Further, rate of return to capital employed and innovative efforts of the firms showed consistent positive sign both general and technology specific levels. The other variable such as scale economies showed consistent negative sign both at the general and specific technology levels except high technology level. In high technology level, scale economy turned as positive and significant determinant of market concentration. It may be because of the huge start up cost required to access minimum efficient point (as discussed in case of export in high technology). Due to this reason, scale economies worked as an entry barriers in high technology industries. Growth of market size confirmed consistent result with previous (general) analysis. Only, low technology group indicated negative sign, but it turned out to be statistically insignificant. On the whole, technology specific analysis suggested that different variables of market structure behaved differently with varying technology levels.

Empirical findings suggested that entry of foreign firms by itself did not reduce market concentration over the reform period. Irrespective of various policy measures announced since mid-1980 (which includes removal of licensing policy; restriction on the entry of FDI; replacement of MRTP with Competition Act, 2002; FERA with FEMA; among others), the large firms have continued to have leading position in the market. This indicated that the unequal strength (size difference) of market players and other structural rigidities facilitated the market leaders, both domestic and MNCs, to consolidate their monopoly position in the market. In this context, the role of regulatory authority should be proactive to ensure proper functioning of the market. In the absence of proactive state intervention, the entry of MNCs can pose serious implications on host country development. Firstly, in a concentrated market structure, the objective of the firms is not to improve the efficiency of production structure, but to create artificial barriers for potential entrants. Second, high concentration level provide discretionary power to

market leaders to set either their price or output level, so that they can maximize their profits. Consequently, it will increase social loss (dead weight loss) as well as effect consumers' welfare through monopoly prices. Third, literature argues that as market concentration is increasing, firms do not have incentive to spend much for innovation to secure their market share. Instead of investing for innovation, firms spent on rent seeking activities to ensure more profits. The overall innovation expenditure will fall which will put hinder the economic growth process because innovation is the key driver of long run growth of firm, industry and economy (Subramanian, 1971; Bhaskar, 1992).

On the whole, empirical findings of present study strongly indicated that FDI was instrumental in promoting market concentration in Indian manufacturing sector in the post reform period. These findings are not consistent with theoretical predictions as well as some empirical findings. The theoretical prediction always suggests that openness will reduce market concentration. Theorist explains that the removal of entry barriers will attract efficient players to expand their production activities. The entry of efficient firms will pressurize the local firms to improve their production technique as well as to innovate for competing with cost effective players. Some empirical literature also supported the above noted theoretical prediction, that is, openness reduced market concentration (Lundin et. al., 2007; Driffield, 2001; Cho, 1990). However, on the basis of findings of present study in Indian context, the objective of policymakers should not only be to attract more FDI but also to maintain the efficient functioning of the market. The objective of FDI is to promote economic growth and well-being of the country and people. Success does not depend only on increasing inflows of FDI, but the efficient functioning of the market is pre-requisite. The efficient functioning of the market can ensure optimum utilization of economic resources.

The increasing market concentration per se need not be harmful. The present study has limited coverage in the sense that it did not examine the outcome. Unless all the outcomes are analyzed, no definite conclusion is warranted. Nonetheless, the findings of the study point towards the need for the institutions involved in dealing with monopolies to be more vigilant.

4.1 Issues for Further Research

There is a scope to enrich this study by exploring following dimensions. Firstly, one can divide the entry of MNCs on the basis of mode of entry (that is, entry mode is green-field or merger and acquisition), to see whether different entry mode affect market structure differently. Secondly, it would be interesting to study the relation between competitive market structure and innovation spending of the firms in Indian context. Thirdly, it would be of interest to explore the reasons as to why different technology categories behave differently as far as FDI and industrial concentration is concerned. Fourthly, is there any relation between entry of FDI and profit margin of the firms or industry?

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