CHAPTER 1
OVERVIEW

1.1 Introduction
This dissertation empirically investigates into the impact of foreign direct investment (FDI) inflows on aspects of India’s manufacturing performance including export growth, technological activity and labour market outcomes during post-reforms. The comprehensive reforms process which began in the early 1990s was not India’s first tryst with economic liberalization. While industrial deregulation started in the early-1980s with a selective approach towards FDI, liberalisation of external trade was initiated in the mid-1980s. Wide ranging changes in India’s industrial policy, especially with regards to foreign capital movements, were introduced in 1991 with complementary changes in other policies as well. India’s foreign investment policy measures initiated in the 1990s, which mark a departure from those of the 1980s, made the economy more open and proactive to build strategic alliances and penetrate the world market (Ahluwalia, 2008). India witnessed quantum increases in FDI inflows since 1991 as a result.¹

FDI inflows to the emerging market economies including India mostly occur through Multinational Enterprises (MNEs), whereby foreign firms acquire a substantial control in a host-country firm or set up a subsidiary in a host country (Markusen, 2002). The theory of the MNEs is based on the assumption of advantages these entities have over the existing local enterprises (Hymer, 1976), in particular advantages arising from ownership, assets, knowledge and technology, risk taking behaviour and long-term financing decisions over the domestic counterparts (Caves, 1996). The multinational

¹ Developing countries witnessed increasing foreign investment inflows since 1980s (UNCTAD, 1995).
firms can have some products and/or processes which give them monopoly advantage as well. Apart from ownership, other firm characteristics also play a role in MNEs acquiring advantage over domestic firms in the host country (Helpman, 2014). The MNEs also have reasons to exploit these ownership advantages in other countries or have advantages arising from location and internalization in the country of operation (Dunning, 1993). This perspective is in sharp contrast to the earlier theoretical perception of FDI responding to differences in the expected rates of return to capital (Mundell, 1957; MacDougall 1960).

FDI flows to emerging market economies can have across-the-board impact on the host economy. To mention a few, FDI supplements resource mobilization, facilitates access to world class technology and technology transfer, improves efficiency and enhances productivity, accelerates exports and expands output. MNEs, through their affiliates and subsidiaries, with larger scale of operation, better marketing and distribution networks, managerial skills, and access to foreign markets than their domestic counterparts, often use the host country as an export platform. MNEs remain internationally competitive through a combination of technological innovation and a variety of complementary assets. Further, in developing nations, MNEs are often instrumental in a variety of spillovers, including export and technology spillovers, to domestic firms\(^2\). It has been increasingly recognized that presence of foreign firms contributes, directly or indirectly, to the technological choices of host country firms. Further, FDI inflows and MNE activities are likely to impact on labour market outcomes, in specific on wage, employment and skill formation in the host country.

\(^2\) Feenstra (2006) provides an in-depth analysis of the effects of FDI, activities of MNEs in particular, in developing countries.
The Context

FDI inflows to India witnessed quantum increases since 1991. According to UNCTAD database, as Figure 1.1 shows, FDI inflows were higher during post-2000 as compared to the 1990s. Foreign direct investment inflows increased from US $ 75 million in 1991 to US $ 7622 million in 2005 and further to US $ 47,139 million in 2008. FDI inflows declined thereafter to US $ 27,431 million in 2010. Despite a slowdown after 2008, FDI inflows increased at an average annual rate of 50.53 per cent during 1991-2010. With higher FDI inflows, as Figure 1.1 shows, there has been a concomitant improvement in India’s international competitiveness and growth. India’s overall growth was higher at around 6.7 per cent during this period as compared to the pre-1991 period. There is a large body of literature emphasizing on the positive impact of foreign capital on growth (Batra, 1986; Balasubramanyam, Salisu and Sapsord, 1996; De Mello, 1997; Borenztein et al., 1998; Nunnenkamp and Spatz, 2003), in sharp contrast to the

![Figure 1.1: GDP Growth and FDI Inflows in India](image_url)

Source: Reserve Bank of India and UNCTAD databases
conjecture of immiserizing growth of foreign capital inflows in a small open economy, a la Brecher and Alejandro (1977).

FDI is also encouraged in India, like in many emerging market economies, to gain international competitiveness. Merchandise exports grew at an average of above 8 percent during 1991-2010, with higher merchandise export growth rates during post-2000. To gain international competitiveness, technology plays an important role along with FDI. The host economy gets access to world class technology with FDI inflows and foreign firms contributing, directly or indirectly, to the innovative activities of host country firms (Lall, 1993). The adoption of the WTO Agreement on the Trade Related Intellectual Property Rights (TRIPS) since the mid-1990s has significant implications for international technology markets and international technology transfer. India’s technology indicators show improvements during post 1991 reforms. India’s in-house R&D stock increased after 1991 along with an increase in non-residents patent applications in India during the same period, especially after 1999 (See Figure 1.2). Further, as Banerjee and Sinha Roy (2014) show, imports of embodied technology, capital goods in particular, increased significantly during this period. A rise in the R&D stock is indicative of an enhancing domestic technological capability, a rise in non-resident patent application in India corroborates to increasing multinational R&D activity in India. Further, such a pattern of development of technological capability in India can be explained, following Dinopolous and Segerstorm (2010), in terms of technology transfer within multinationals when IPR protection is strong in a southern country. FDI has thus emerged as the major channel of technology transfer and international diffusion of knowledge and technology in India (Kumar, 1995; Glass and Saggi, 2009).
With increase in MNE operations in India since 1991, the hitherto protected domestic firms facing competition had to review their technology strategies. As technology followers, on one hand, it was expected that there would be a huge dependence on imported technology. While on the other, it was also argued that the inward looking policies followed by India in the first three decades after independence have enabled the manufacturing industries to develop a high capital base. Hence, firms are likely to invest in local R&D as well.

Expansionary effects of export growth and technological activity are likely to have impact on host country labour markets on skill formation, wage, employment and job quality. However, employment growth, as estimated from the National Sample
Survey Organisation database, has been low at around 1.50 per cent between 1999-2000 and 2009-10. A paradox is apparent: increasing FDI inflows, high export growth and enhanced technological activity have not led to simultaneous employment growth in India. It can be observed that FDI and imported technology might improve labour productivity in the developing economies but can have differential impact on wages and employment. While improvements in labour productivity can lead to higher employment in the presence of output growth, increased dependence on imported capital-intensive technology across sectors can be labour displacing as well. An understanding of the effect of FDI inflows, MNE presence in particular, on employment is thus of paramount importance.

This dissertation is an empirical exploration of these varied effects of FDI inflows and MNE operations on India’s manufacturing sector since 1991. With increasing FDI inflows through MNEs, ownership and factors specific to firms have emerged critical in explaining export performance, technological activities and employment across manufacturing industries. A deeper understanding of the key dimensions of impact of FDI inflows will necessitate a critical review of the existing literature.

1.2 Review of Literature

In this section, a review of the three issues related to foreign direct investment, namely FDI and export performance, FDI and technological activity and FDI and labour market outcomes, in the existing theoretical and empirical literature will provide an understanding of the nuances therein.
1.2.1 FDI and Export Performance

Apart from a large literature on the choice of MNEs between exporting and direct investments abroad\(^3\), the literature also focuses on the relationship between capital movements, FDI in specific, and international trade. Markusen (2002) shows that with capital movements, inter-firm trade behavior is determined by a wide range of firm specific factors. Differential access to factor markets, international market linkages and differential technological and organizational capabilities are identified to be some of them.

MNEs with competitive advantages over the domestically owned firms tend to be more export oriented. The MNE affiliates, as Dunning (1988) suggests, as a part of the parent company have the advantage of established marketing channels, better knowledge of foreign markets, possess experience and expertise in international marketing, thereby gain cost advantage. This favors export competitiveness of the domestic firms. For a better understanding of such effects of FDI on export performance of the host country, it is useful to distinguish between horizontally and vertically integrated (Helpman, 1984) multinational firms. In case of horizontally integrated MNEs, the same product is produced in multiple plants located in many countries. In a situation of oligopoly competition, in countries of same size and relative endowments, FDI favors exports of the home country under high transport and tariff costs and large firm-level economies of scale (Markusen and Venables, 1998; Markusen 2002). In case of the vertically integrated MNEs, different segments of the production process being carried out in different

\(^3\) See Caves (1996) for an exhaustive review on this issue.
countries, intermediate products are necessarily traded (Zhang and Markusen, 1999; Markusen 2002). In such a case, FDI has positive effect on the host country exports.\(^4\)


\(^4\) However, FDI can be export limiting if the MNE affiliates, trade in high-technology goods (Lall and Streeten, 1977; Newfarmer, (1983).
manufacturing find that foreign ownership has a positive significant impact on export performance.

For India, Kumar (1994a) analyzing forty three Indian manufacturing during 1975-1976 to 1980-1981 did not find any significant difference in the export orientation of the MNEs as compared to their local counterparts. Kumar and Siddharthan (1994) also observed similar results for thirteen manufacturing industries during the same period. Aggarwal (2002) finds evidence on better performance of the MNEs over their local counterparts. However, no strong evidence was found to suggest that India was attracting efficiency seeking, outward oriented FDI. Further, Aggarwal (2002) shows that low-technology industries with high foreign ownership have better competitive advantage than high-technology ones. Earlier, Subramanian and Pillai (1979) and Kumar (1990) also arrived at similar results in case of Indian manufacturing sector. This is in line with other empirical works relating to India and other developing countries [Newfarmer and Marsh, (1981), quoted in Lall and Mohammad, (1983), Sharma (2000)]. Kumar and Pradhan (2003), analyzing the export performance of over 4000 Indian enterprises in manufacturing for the period 1988-2001, however find that the Indian affiliates of MNEs perform better than their local counterparts in terms of export orientation.

Apart from ownership, a recent strand of research focuses on the effects of international trade and finance on industry performance. The key mechanism through which international trade spurs the dynamics of industries in these models is driven by a process of competition among heterogeneous firms (Castellacci, 2011). This is against the initial trade theory models (e.g. Helpman and Krugman, 1985), which introduced within-industry heterogeneity, but did not explain asymmetries across firms in terms of
productivity or size. This implies that all firms within each industry are equally capable to export to all countries (Helpman, 2006). On the contrary, only a fraction of firms export and the exporters are larger in size and are more productive than the non-exporters.

Bernard and Jensen (1995,1999) show strong self selection by productive US firms in the export market. Based on this, Melitz (2003) pioneered a dynamic industry model in general equilibrium framework and incorporated firm-level heterogeneity into the model. The model starts with the fact that firms face fixed cost to export. However, they differ from each other in productivity in terms of the capability to bear this fixed cost. Each firm makes a productivity choice from an exogenous distribution which in turn determines whether they do actually produce to export. There exists a productivity threshold beyond which a firm acquires the capacity to participate in the export market. Only some firms with high productivity can bear these costs and find it profitable in the international market. Hence, highly productive firms self select into the export markets, while others exit.

Aw, Chung and Roberts (2000) using micro data from South Korean (1983-93) and Taiwanese (1981-91) manufacturing industries show that the plants participate in export market on account of firm productivity as predicted by self selection model. Empirical evidence support that exporting firms have higher productivity than non-exporting firms (Clerides, 2003; Bernard and Jensen, 1999; Bernard and Wagner, 1997; Delgado et al., 2002). Firms with high productivity tend to enter export markets while the low productive firms exit. Clerides et al. (1998) also highlight the importance of self selection of more productive firms in the export market. Baldwin and Gu (2003) find
positive association between export market participation and productivity growth in Canadian manufacturing. Further, they find the effect to be much stronger for the domestically owned firms than that of the foreign controlled enterprises. Ranjan and Raychaudhuri (2011), for Indian manufacturing, suggest that exporters tend to outperform the non-exporters in terms of productivity, size, remuneration levels and capital intensity. Using firm-level data on Indian manufacturing, Srinivasan and Archana (2011) show that firm heterogeneity is an important determinant of the decision to export. Further, exporting firms are found to be larger, more R&D intensive and more productive than the non-exporting ones.

Further, Roberts and Tybout (1997), Bernard and Jensen (2004), and Das, Roberts and Tybout (2007) suggest that there exist large sunk costs of exporting in developed and developing countries alike. Heterogeneity also exists in terms of the capability to bear these specific costs, which explains export performance of firms. Firm productivity also works through heterogeneous skills of workers (Yeaple, 2005) as well as importing activities of firms (Castellani, Serti and Tomasi, 2008). Further, the studies of firm heterogeneity and monopolistic competition are extended to the issues of trade, unemployment and wage inequality (Helpman et al. 2010).

1.2.1 FDI and Export Spillovers

MNEs, endowed with specific advantages, can as well impact on the host country domestic firms. FDI is often supposed to be of higher quality if it is export oriented, which induces economic spillovers (Enderwick, 2005). Such spillovers from the MNEs ultimately lead to productivity growth of the host economy (Caves, 1972; Globerman,
1979; Blomstorm and Persson, 1983; Haddad and Harrison, 1993). Literature explores horizontal and vertical spillovers. Horizontal spillovers mostly involve sector specific technical knowledge, while vertical spillovers are more general than sector specific. The spillover benefits to the domestic firms arise through various channels of transmission\(^5\) like imitation, skill acquisition, competition and exports. While the theoretical literature suggests imitation as the major spillover channel, Haacker (1999) and Fosfuri et al. (2002) argue that the knowledge that workers bring with them is the most effective spillover channel. Wang and Blomstorm (1992), Glass and Saggi (2002) emphasize on the role of competition for spillovers to be effective.

Again, export being a major spillover channel is also evident in literature. MNEs are believed to possess strong distribution networks, good infrastructure and linkages, knowledge of the consumers’ tastes and preferences and regulatory arrangements in overseas markets. Domestic firms learn to export from MNEs through collaboration or imitation. Export activities of MNEs often produce externalities that enhance the export prospects of domestic firms (Rhee and Belot, 1990). Aitken, Hanson and Harrison (1997) show spillovers from information externalities with MNEs, but not from general export activity. Sousa, Greenaway and Wakelin (2000) confirm positive spillovers from MNEs and identify export information externalities, increased competition in the domestic market and demonstration effect through which domestic firms become more export oriented in response to the activities of MNE subsidiaries in the host country. Kneller and Pisu (2007) also find significant export spillovers from the operations of foreign affiliates in the UK. Swenson and Chen (2014) show that own-industry multinational firm contact

\(^5\) See, for instance, Bergman (2006).
associates with more frequent, higher valued and long lasting exports which arise from beneficial spillovers. Ruane and Sutherland (2004) also find positive effects from the MNEs on both decisions to export and export share. Buck et al. (2007) find evidence of export spillovers across industries. Buckley et al. (2002) also show spillovers to Chinese local firms through transfer of marketing skills from MNEs.

On the contrary, Barrios et al. (2003) find no evidence of MNE effect on the export share for Spain. The results Konings (2001) also suggest no positive spillover from foreign to domestic firms in Bulgaria, Romania and Poland. However, when absorptive capacity is considered, positive spillovers are found in R&D intensive firms in Bulgaria and Poland.

The studies reviewed above bring forth the FDI-export relationship across countries. However, the impact of FDI on both export performance and export spillovers is far from conclusive. Second, with an exception of China, not much attention has been given in this context particularly in terms of export spillovers for the emerging market economies including India. In the Indian context, spillover is mostly studied at the industry-level and the results arrived at the industry level might not hold at a disaggregated level, given heterogeneity of firms across industries. Further, most of these studies have not taken into account firm heterogeneity while exploring the FDI-exports relationship. This study attempts to fill in the gap of exploring FDI-exports relationship at the firm-level controlling for firm heterogeneity across manufacturing sectors.
1.2.2 FDI, Technological Choices and Spillovers

The role of technology in determining a country’s international competitiveness has been emphasized in the neo-technology theories of trade (Posner, 1961; Vernon, 1966; Krugman, 1979, among others). The emerging literature has also shown that FDI, new technology generation and technology transfer has often determined economic growth (Saggi, 2002). Borensztein, Gregorio and Lee (1998) show that the extent of adoption and implementation of technology already in use in an innovating country determine economic growth of a developing country. With the global economy becoming more open and interdependent, the role of technology has become even more important.

The theoretical literature on FDI and technology spillovers started to emerge from the 1970s onwards. The Industrial Organisation theory recognizes the role of spillover effects of FDI (Hymer 1976), which emphasizes that a firm in order to undertake FDI in a foreign country must possess some special ownership advantage than the domestic competitors (Caves, 1974). MNEs while operating in other economies thus entail a cross border transfer of a variety of resources including process and product technology, managerial skills, marketing and distribution networks etc. Most of the theoretical models on FDI and technology transfers have a common characteristic of considering technology transfers as an externality from the MNEs to the local firms in the host economy. However, these models differ in terms of interpretation of technology. While in some models, technology of foreign firms is assumed to be a kind of public good which is transferred automatically, in some other models, foreign technology is treated as a private good which is costly. Hence, the extent of technology transfer depends on the capacity of the local firms and their interaction with the foreign firms.
Koizumi and Kopecky (1977) were the first to model international capital movements and technology transfer in a small open economy assuming that technology transfer takes place when foreign capital creates externality in technology of the host country. They find that an increase in the savings rate of the country reduces foreign capital and steady state capital intensity through its effects on technical efficiency. Wang and Blomstrom (1992) analyze international technology transfer through MNE in a game theoretic framework, where technology transfer is assumed to be a process by which foreign technology diffuse to domestic firms through foreign subsidiaries and make recipient firms more efficient. De Mello (1997) show that growth rate of the host economy is positively associated with the level of FDI. Kabiraj and Marjit (2003), considering a duopoly model where a foreign firm competes in a host country, show that imposition of tariff may induce technology transfer from foreign to local firms thereby leading to welfare improvements in the host country. Further, Mukherjee and Marjit (2001) show that technological collaboration coupled with equity participation improve the quality of transacted technology relative to a situation characterized by a pure technology licensing agreement. The theoretical literature thus justifies the inflow FDI, MNE operations and technology transfers in the host economy. In this process of technology transfer, the role of innovation and imitation efforts becomes crucial. The question of firm’s technological choice thus becomes pertinent.

Early theoretical literature on R&D activities of MNEs concentrated on product adaptation. This predominantly considered cross border transfer of mature technologies as the dominant motive for decentralization of R&D geographically [Vernon (1974), Dunning (2000), Lall (1979)]. The determinants of such global spread of R&D activities
of the MNEs can be traced into the two forces which on one hand, compel the MNEs to keep R&D as a headquarter function (centripetal factors) and those which pull it away from the centre into peripheral locations (centrifugal factors). The centrifugal forces operate because there may be a need to adapt production processes and characteristics of products to meet local conditions. Again, MNEs may undertake R&D overseas in order to benefit from localized technology spillovers in these locations with a view to maintain a competitive edge. With the recent works of Ronstadt (2002), Pearce (1999), Birkinshaw and Morrison (1995), and Vernon (2000) it is now being suggested that the technology seeking motive itself has become a significant contributor in disseminating R&D by MNEs particularly in the R&D intensive sectors. Further, Mukherjee and Sinha (2013) in a North-South trade model show that southern patent protection makes southern firms better off by increasing the southern firms’ incentive to innovate and affecting the nature of competition in the world market. In sharp contrast to the conventional perception, the modern knowledge seeking R&D laboratories seek for geographically differentiated frontier technology with the motive to preserve the technological lead of the MNEs.

Along with the process of developing new technologies, MNEs form one of the major channels of technology spillovers. Findlay (1978), Das (1987), Wang and Blomstrom (1992), Perez (1997) contribute to the theoretical literature focusing on the effects of the presence of MNEs on the technology development of the host country. They emphasize on the fact that spillover benefits might increase with the technology gap between local recipient and foreign investors. Findlay (1978) formulates a dynamic model to analyze the role of MNEs in the process of technological transfer to the LDCs. Das (1987) extended Findlay’s model, considering technological spillovers from the
subsidiary to the host country firms, show higher productivity spillovers to the domestic firms resulting from higher production of the subsidiary. The firm’s own capability is also crucial in making use of the knowledge that they can access (Blomstrom and Kokko, 2003; Keller, 1996; Rogers, 2004).

The empirical literature on the issue has spawned into two different directions. The first approach finds a link between technology imports and local R&D while the second relates to the diffusion of the imported technology through knowledge and productivity spillovers to the locally owned firms. The nature of the relationship between technology imports and local R&D has been a matter of debate. For some (Blumenthal, 1979; Lall, 1993; Katrak, 1985), the relation is complementary while for some others (Kumar, 1987; Basant and Fikkert, 1996; Kathuria and Das, 2005; Chuang and Lin, 1999; Fan and Hu 2007) foreign technology import substitutes local R&D. One school of thought establishes that foreign firms can contribute directly or indirectly to the technological activities in the host country in order to adapt to local conditions, while the domestic firms in presence of competition from foreign firms may invest in technological activities. Lall (1983), Nelson (2004), Toimura (2003), Sasidharan and Kathuria(2011), Basant and Mishra (2014) and Kumar and Aggarwal (2005) provide evidence on complementarity. The other view is skeptic about the technological efforts of foreign firms in the host country as MNEs have easy access to the parent firm’s technology (Globerman and Meredith, 1984; Fan and Hu, 2007) and domestic firms’ in-house R&D, given huge costs and gestational lags. A large number of studies including Kumar (1987), Basant and Fikkert (1996), Kathuria and Das (2005), Veugeler and Van den Houte (1990), Lee (1996), Fan and Hu (2007), among others, find substitutability between
technology imports and domestic R&D. The evidence is thus not conclusive with regards to the relationship between imported technology and domestic R&D. This is particularly intriguing when there is a difference in the behavioral pattern of the MNEs and domestic firms, as observed by Caves (1974).

While encouraging FDI, developing economies hope not only to import more efficient foreign technical expertise but also to generate technological spillovers for the domestic firms. Such spillovers might occur through the potential channels of demonstration effects, labour turnover or vertical linkages. The initial econometric studies consider presence of spillover in case of a positive correlation between FDI and productivity (Caves, 1974; Globerman, 1979; Blomstrom and Persson, 1983; Blomstrom, 1986; Haddad and Harrison, 1993; Blomstrom and Wolff, 1997). Branstetter (2006) results provide evidence on FDI as a channel of knowledge spillovers. Yao and Wei (2007) find that FDI induces production efficiency through shifting of the home country’s production frontier. Chang, Chung and Dean (2007) focus on technological spillovers from foreign to local firms as well as among local firms.

Spillover effects of FDI can also be observed by analyzing how technology import from the foreign firms affects the various industry characteristics. For instance, Dasgupta (2012) show diffusion of knowledge spillovers from foreign firms on welfare, wages and occupational choice. Blomstrom, Kokko and Zejan (1994) establish a significant relationship between technology imported by the foreign affiliates and the local competitors’ investment, output growth and labour skills. Bwalya (2006) and Liu (2008) find significant knowledge spillovers through backward linkages from foreign firms in upstream sectors to local firms in downstream sectors. Javorcik (2012) shows
evidence of vertical productivity spillovers. The studies discussed so far suggest that foreign investment creates spillover effects.

There are studies which present a more nuanced view. Aitken and Harrison (1999) find the presence of a positive relationship between foreign equity share and the plants’ productivity only in small firms. There is evidence of negative spillovers from joint ventures to firms with no foreign investment. Okamoto (1999) finds that technology transfer from Japanese to US firms only partially explains the improvement of the performance of the US firms. Cantwell (1989) found spillovers to be significant only in industries where the technology gap between local and foreign firms was low. Further, Kokko (1994) and Tsou and Liu (1994) technology spillovers do not generally occur in technologically complex industries.

In the Indian context, Basant and Fikkert (1996), using panel data on Indian firms show high and significant private returns to technology purchases and low and insignificant private returns to the firms’ own R&D expenditures. They also found evidence of both international and domestic R&D spillovers. Kathuria (2001) finds presence of knowledge spillovers from the foreign to domestic firms belonging only to the ‘scientific’ sub sectors, provided the firms themselves engage in R&D activities. Again, Feinberg and Majumder (2001) find R&D spillovers among the MNEs only in the Indian pharmaceutical industry, but Bergman (2006) shows no significant correlation between FDI and domestic firm’s productivity. Marin and Sasidharan (2010), in terms of an alternative model, show that only creative MNE subsidiaries in India have positive effects on innovative capacity of host country firms. In all these models of international

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6 Malerba et al. (2013) find higher foreign R&D spillovers than domestic R&D, though not for India.
diffusion of technology and technology transfer, what stands out to be of importance is an individual firm’s choice of technological activity.

In India’s context, while limitation of studies including Katrak (1985) and Deolalikar and Evenson (1989) is with respect to use of industry-level data, others including Kumar and Saqib (1996), Basant (1997), Kathuria (2001) are firm-level studies but for the pre-reform period. The analysis by Kumar and Aggarwal (2005) uses firm-level data for the 1990s. It is observed in Chapter 2 that there is a distinct change in technology acquisition pattern post-2000, which most of the studies except Basant and Mishra (2014) do not cover. This study adds to the literature by taking into the changes in firm level technology acquisition pattern across high-technology, medium-high technology, medium-low technology and low-technology sectors during post-2000.

1.2.3 FDI and Labour Market Outcomes

The linkage between international trade and factor markets has assumed significance in emerging market economies like India with integration of these economies with the rest of the world. With FDI inflows and MNE operations, exports grew and access to foreign technology improved in these economies. Such growth in exports and import of sophisticated foreign technology following wide ranging reforms are likely to have immense implications for labour market outcomes both in terms of employment (Das, 2008; Ghose, 2003,2000; Goldar, 2002; Marjit and Acharyya, 2002; Wood, 1994) and wages (Bruno, Falzoni and Helg, 2003; Grenaway, Hine and Wright, 1999; Goldar, 2008; Haouas and Yagoubi, 2004; Hasan, Mitra and Ramaswamy, 2007; Jean, 2001; Rodrik, 1997; Slaughter, 2001). The H-O-S framework suggests that
employment reduces with increased imports while it increases with increased exports. However, such implications are very industry specific. There can be a variety of factors by which liberalization might affect employment, the important factors being trade, FDI and international technology transfer. If FDI is concentrated in labour intensive industries, the positive impact of FDI on the level of employment would be substantial. FDI can also lead to increased employment in local firms as a result of backward and forward linkages.

Theoretical literature suggests that the impact of FDI on total employment can be understood in two different ways. One argument is that with inflow of FDI there is an exogenous growth of output which in turn enhances employment opportunities. If an MNE firm makes long term commitment in the host country, it can provide stable employment (Jenkins, 2006). Apart from bringing in a package of productive resources into the host country, FDI creates a significant possibility of job creation not only in the FDI intensive sectors but also in supporting domestic industries (Hill and Athukorola, 1998). Further, MNE affiliates facilitate access to foreign markets through exports and generate sources of employment. The benefits do not remain confined to the quantitative increase in employment but also improves the quality of the workforce in terms of skill and knowledge spillovers (Young, 1988; Acharyya and Kar, 2014). One channel of such spillover is through turnover of employees (Fosfuri et al., 2002; Glass and Saggi, 2002; Gorg and Strobl, 2005) and managers (Gershenberg, 1987; Pack, 2001).

The impact of FDI on the labour market of the host economy can also be based on the Industrial Organization theory. As Hymer (1960), Kindleberger (1969), and Caves (1971) argue that foreign firms possessing sophisticated technology, managerial skills,
and marketing and distribution networks often have some monopolistic advantage over domestic firms. Thus varying labour market outcomes can arise from the kind of technology employed by the foreign firms as compared to local firms. The technology introduced by the MNEs is highly capital intensive and skill based, which often reduces employment potential as they are expected to have lower employment elasticity of output as compared to domestic firms with labour intensive techniques of production (Pradhan et al., 2004). The idea that FDI may not bring in technology which is labour augmenting may lead to an absolute reduction in the overall employment (Nickel and Bell, 1996; Vivarelli and Pianta, 2000; Taylor and Driffield, 2000). There are nuanced effects as well, which is typical to developing economies. The dual effects of foreign capital inflows on employment are similar to that of trade liberalization, as is evident in a large body of literature (Wood, 1994; Krugman, 1995; Lall, 2002; and Marjit and Acharyya, 2002).

The experience of different countries has been varying with respect to the effect of FDI inflows on the level of employment. Nunnenkamp, Bremont and Waldkrich (2007) investigated the effect of FDI on the employment generation of Mexican manufacturing industries. A panel data analysis across 200 manufacturing firms reveals that FDI has a significant positive impact on the manufacturing employment of Mexico. Fu and Balasubramanyam (2005) found a strong linkage between FDI and employment as well as FDI and exports in China. This is in line with the works of Lipsey and Sjoholm (2004b) and Swenson, (2008). In a recent empirical study Karlsson, Lundin, Sjoholm and He (2009) show that FDI has led to employment in the Chinese manufacturing through its access to international markets and other firm characteristics.

This linkage between FDI and factor markets has gained importance particularly in the emerging market economies like India. High export growth and increasing importance of value-added non-conventional items in the export basket post liberalization are likely to have labour market repercussions. Most studies on India have observed the impact of trade liberalization on employment. For instance, Goldar (2000) shows positive impact of trade liberalization on employment. Goldar (2002) further finds that at the aggregate level, employment elasticity increased from 0.26 in pre reforms to 0.33 during post reforms. A rising trend in employment elasticity is also noticed in the export oriented sectors post reforms. Pradhan et al. (2004) findings suggest that foreign firms do not have any adverse effects on the manufacturing employment in India as compared to
their domestic counterparts. Banga (2005) examines the impact of FDI, trade and technology on employment and wages of the Indian organized manufacturing industries. The results show that FDI, trade and technological progress have differential impact on wages and employment. In contrast to the FDI-wage rate relationship in an industry, foreign capital is found to have no effect on employment. However, higher export intensity of an industry increases employment of the industry.

Empirical literature is does not find a positive impact of international trade on wages and employment (Revenga, 1992; Feenstra and Hanson, 1996; Machin and Van Reneen, 1998; Berman and Machin, 2000; Hanson, 2001; Onaron, 2008). Davis and Mishra (2007) argue that imports are not substitutes but complementary to what is produced domestically, then a positive effect on employment is possible. Revenga (1997) confirmed a complementary relationship between import of inputs and employment in Mexico during 1980s. For India, Hasan, Mitra and Ramaswamy (2007) found that labour demand elasticities with respect to wages increased after trade reforms particularly in the states which have flexible labour markets for India. Sen (2008, 2009) find no significant effect of export orientation and import penetration on employment. Similar results were arrived at in the works of Chister, Kupets and Lehmann (2005) for Ukraine and Abdi and Edwards (2002) for South Africa.7

The literature on FDI and employment is far too less to provide any conclusive evidence on their relationship. This justifies further research on the issue of FDI inflows

7 Elia, Mariotti and Piscitello (2009) in a slightly different angle investigate the effects of outward FDI on the home country employment and skill composition. Empirical evidence refer to an Italian case through the period 1996-2002 and shows that outward FDI has a significant negative impact on the demand for the low skilled workers in the parent company’s “industrial region”, but this is true only for FDI in low wage countries. On the contrary, Navaretti, Castellini and Disdier (2006) for France and Italy find no evidence of negative effect of outward investments to cheap labour countries on labour demand.
and MNE operations and impact of the same on firm-level employment across Indian manufacturing industries during post-2000.

1.3 Objectives of the Study and Summary of Findings

Based on the above review of the existing literature, the study delves into three major issues relating to the firm-level impact of FDI inflows and MNE operations on Indian manufacturing. These include:

- Examining the factors that underlie firm-level export performance across manufacturing industries in India during post-reforms period. In particular, the study highlights on foreign ownership while controlling for various firm-specific supply factors including size and age of the firms, import of raw materials, imported capital goods and foreign technical knowhow, expenditure on advertising and marketing, local R&D, labour productivity and availability to credit. Further, whether exports by MNEs have spillover effects on the exporting behavior of the domestic firms is also studied.

- Exploring into firm-level technological choices across high, medium-high, medium-low and low technology industries in Indian manufacturing since 1991. The determining factors of such technological choices are analyzed. In this context, the role of ownership and technological spillovers from both domestic and foreign firms are accounted for, in particular.

- Understanding the various dimensions of firm-level aggregate employment across manufacturing industries in India in the post-reforms period. In doing so, the
study highlights on whether foreign ownership, imported technology and productivity determine firm-level labour demand across sectors.

In what follows is a brief outline of the ensuing chapters and the key findings. Subsequent chapters of the thesis are organized in the following manner. The stylized facts on the trends and patterns of firm-level export performance, technology choices and employment across sectors in Indian manufacturing are presented in Chapter 2. For the analysis of the trends in the export performance, behavior of firm-level average export intensity is studied for the period 1991-2010. Further, an analysis comparing the trends in the average export intensity of domestic and foreign firms is also carried out. Technology activity of firms during the same time is understood in terms of technological intensities including R&D intensity, capital good import intensity, foreign technology intensity and raw material import intensity for the high, medium-high, medium-low as well as low technology industries. A similar exercise is carried out comparing the trends in technological acquisitions of domestic and foreign firms. The observed increase in export intensity and technology acquisition particularly after 2000 is sure to have significant impact on firm-level employment. This study analyses employment-intensity patterns in Indian manufacturing during post-2000. The sectors considered for the purpose of analyses are food and beverages, textiles, chemicals, basic metals, machinery and transport equipment industries, which account for more than 70 per cent of India’s manufacturing. The choice of these industries also gives us an insight about post-reform export performance of medium-low/low technology industries like food and beverage, textiles and basic metal in comparison to the medium-high/high technology industries like chemicals, machinery and transport equipment. These stylized descriptions provide
the basis of understanding the factors determining export performance, technology activities and employment in Indian manufacturing during post reforms.

Chapter 3 on ‘FDI, Firm Heterogeneity and Exports: An Analysis of Indian Manufacturing’ sets out to understand the determinants of export performance during post reforms. Here an attempt is made to understand whether foreign ownership as well as heterogeneity of firms measured in terms of labour productivity and capability to bear sunk costs play a dominant role in explaining export performance of firms. This is done while controlling for other supply side factors that impact on firm-level exports. Further, this chapter also explores into firm-level export spillovers. An analysis is made to understand whether exporting activities of foreign firms have any significant impact on the export performance of domestic firms. This, in a way, explains direct export spillovers. However, various other channels through which spillovers can occur are not accounted in this study. A supply side deterministic model is adapted following Aitken et al. (1997). Hausman-Taylor estimation technique and dynamic panel data methods are used for the purpose of estimation.

Chapter 4 on ‘FDI, Technological Choice and Spillovers: An Analysis with Indian Firms’ analyses the factors influencing firm’s technology choices across high, medium-high, medium-low and low technology industries in the post reforms era. Technology choice pattern is analysed in terms of ownership of firms and technological spillovers from domestic and foreign firms. A Logit framework is constructed to empirically explore the technology choice determinants. Odds Ratios and the estimated marginals are used for the purpose of analysis.
Chapter 5 on ‘FDI and Employment: A Firm-level Exploration’ provides an estimate of the impact of ownership, labour productivity and technology acquisition on firm-level labour demand across industries post 2000. A dynamic labour demand function is constructed, labour demand elasticities being estimated for all variables except foreign ownership. To estimate this dynamic aggregate labour demand function, Hausman-Taylor estimation method is used.

Chapter 6 concludes the study summarizing the major findings on export performance and export spillovers, technological choices and knowledge spillovers and firm-level employment. The results have profound implications for policy.

Finally, before presenting the findings of the study in brief, a short description of the database is in order. An understanding of the database used is important in interpreting the main results in a focused manner. The study builds a consistent dataset of all variables used in the analysis. It addresses the concerns regarding comparability of data overtime. A very careful editing of possible erroneous observations is done. Firm-level data for Indian manufacturing for the entire analysis is obtained from the PROWESS database of the Centre for Monitoring Indian Economy (CMIE). PROWESS database, however, do not provide data on number of employees. We make use of the Annual Survey of Industries (ASI) database to arrive at the variable. A note on data used in this study is provided in Appendix I.

The Findings

Along with increase in FDI inflows, average firm-level export intensity across manufacturing sectors in India improved during post-reforms, especially after 2000. The
average export intensity of Indian manufacturing increased from 0.10 in 1990s to 0.15 in 2000s, but with sectoral variations. The sectors considered for the purpose are food and beverages, textiles, chemicals, basic metals, machinery and transport equipment industries. The average export intensity for food and beverages, textiles, chemicals, basic metals, machinery and transport equipment industries as a whole, increased after 2000. There is however no conclusive evidence of better export performance of foreign over domestic enterprises across sectors in India. Technology acquisition has shown an increasing trend in the post 2000s reflecting huge dependence on imported raw materials for most sectors. Employment in Indian manufacturing shows a rising trend post 2000 with sectoral differences.

Estimation results suggest that ownership does not have a significant role in explaining export performance of Indian manufacturing across sectors. However, with liberalization the manufacturing industries have grown competitive with the import of raw materials, foreign capital good, and imported technical know-how. Importantly, heterogeneity explained in terms of sunk cost rather than productivity plays a significant role in explaining export performance of firms across sectors. Availability of credit plays an important role in determining export performance of only the transport equipment industry. Significant presence of direct export spillovers is also observed only in this industry.

Estimation results further suggest that foreign ownership and technological spillovers have significant effect on the firm-level technology choices. Dependence on imported technical knowhow is evident from the study. The results further indicate that foreign ownership plays no significant role in determining labour demand across most
sectors in Indian manufacturing. Technology acquisition is not found to be labour
displacing for most sectors and increase in output has an expansionary effect on firm-
level employment. On the contrary, productivity has a dampening effect on employment
which possibly works through increased wage.