

CHAPTER-II

REVIEW OF LITERATURE

2.1 INTRODUCTION :

In the present chapter the review of the literature related to Foreign Direct Investment and its impact in terms of economic growth, local R&D, productivity and trade has been undertaken. The role of FDI in the process of economic growth has been a burning topic of debate in several countries including India¹.

It is asserted that FDI inflows could contribute to increasing the growth rate of the host economy by augmenting the capital stock as well as with infusion of new technology. Further FDI may also act as a substitute instead of complementing the domestic investment in product or capital market with their market power, well known brand names and may thus be immiserising the economy. The effects of FDI in the host country are normally believed to be: increase in the employment, productivity, boost in export and enhanced pace of transfer of technology. The potential advantages of the FDI on the host economy are, it introduces modern techniques of management and marketing, eases the access to new technology, and it facilitates the utilisation and exploitation of local raw materials. At the same time it is also felt that FDI can lower the rate of economic growth by excessive profit repatriation.

FDI can also be used for financing current account deficits. The advantage of finance flows in the form of FDI is that it does not generate repayment of principal and interests and increases the stock of human capital via on the job training. Many policy makers and academia contend that foreign direct investment (FDI) can have important positive effects on a host country's

¹See, Sarbapriya Ray 2012. He assessed empirically, the relationship between Foreign Direct Investment (FDI) and economic growth in India.

development effort by increasing productivity and stimulating R&D efforts. Number of studies have been conducted in India as well as in other countries which have examined the role of FDI in a country's development. In the present chapter these studies are reviewed in order to provide the justification for the current study. The review has been conducted in three broad categories. In the first part, the effect of FDI inflows on economic growth of countries other than India has been reviewed, this is followed by similar studies in India. In the next section, a study of the effect of FDI on trade of other countries followed by similar studies in India have been done. Finally, the review of literature on the effects of FDI on R&D activities of a country on similar lines is presented.

2.2.1. *Impact of FDI on Economic Growth :*

The theoretical and empirical literature on the growth effect of FDI by Multinational Corporations are large in number. These researches have attempted to analyze the impacts of FDI on host country's economy and competitiveness of firms. Some of these studies have come to the conclusion that the impact is positive while some have experienced negative effects as they found foreign direct investments have often crowded out domestic investment instead of complementing it. It is clear that these studies are inconclusive about the impact.

In one of the early studies, Chenery and Strout (1966) provided a description on how external resources could lead to increase in the overall rates of domestic investment, and hence GNP, in developing countries. They asserted that external sources of finance could enhance the growth potential of these countries by augmenting the domestically available investible surplus. They pointed out that the low levels of domestic savings act as restraints on the domestic investment activity, and eventually on the desired levels of economic growth. With external resources removing the hurdles on domestic investment, developing countries can launch into a path that would eventually result in self-sustaining growth.

Caves (1974) and Globerman (1979) did country case studies and by using industry level cross sectional data they found that greater foreign presence is correlated with greater labour productivity in Australia and Canada.

Borenzstein, et al. (1988) used cross sectional data for 67 developing countries for the period 1970-89. Using seemingly unrelated regression methods they found that FDI has a positive effect on economic growth due to the technology diffusion, however the magnitude of this relationship is dependent on the quality of human capital of the host country.

Caves (1996) noted that effect of FDI on productivity growth occurs via two channels: technology transfer and heightened competition. He noted that change in level of competition is associated with increased productivity. When productivity increases marginal firms are forced to move out while remaining firms improve their efficiency to ensure their survival. The FDI spillover prevails.

Chadee and Schlichting (1997) discuss some aspects of foreign direct investment in the Asia-Pacific Region and conclude that FDI has made a positive contribution to all the economies in that region.

Balasubramanyam, et al. (1999) presented an analysis of the role of Foreign Direct Investment (FDI) in promoting economic growth within a new growth theory framework. They laid stress on the size of the domestic market and the level of competition prevailing in the market. They found that interactions between FDI and human capital exert an important influence upon growth performance.

Agarwal (2000) presented empirical evidence on the impact of foreign direct investment on national investors and on GDP growth, by using time series cross section analysis of panel data from five main South Asian countries i.e. India, Pakistan, Bangladesh, Sri Lanka and Nepal for the period 1965 -1996. He found that increase in FDI inflows in South Asia were associated with many fold increase in investment by national investor. This study found that there exists a relation of complementarity between foreign and national investor especially after initiating liberalisation.

Zhang (2001) analyzed the data from 11 countries in East Asia and Latin America, using econometric techniques such as unit root and co integration tests. He found that FDI promotes economic growth in countries that have a liberal trade regime and highly skilled work force.

Nair & Weinhold (2001) in their study revealed that firms with foreign equity participation have more productivity but only in small enterprise. They studied the economies of over 24 countries and found considerable heterogeneity among them. They used Mixed Fixed Random estimator to deal with heterogeneity between investment and economic growth in developing countries. The mean estimate of the MFR is less biased under realistic assumptions. They found that the efficacy of FDI is higher in open economies. They concluded with a suggestion of micro level studies of FDI, trade openness and human capital in order to understand how strong this relation is between these variables.

Proenca et al (2002) empirically tested whether the transfer of intangible assets of foreign enterprises raise the productivity of the domestic firms. They used panel data at the firm level for the period 1996-99 for Portuguese manufacturing industry with Extended GMM technique specially designed for panels with a small number of time periods. This study confirms the fact that FDI have a positive effect on domestic firms with a reasonable technological advance. Their results suggest that endogeneity of the skilled labour and the technological gap variables should be taken into account while studying the effect of FDI along with other co operant variable.

Golejewska, A (2002) analysed the potential effects of FDI on the quantity, quality and location of employment in a host country. The analysis shows direct impact of FDI on employment creation/ preservation in Polish manufacturing during transition. It shows that foreign presence has a positive impact on performance of domestic industry as a whole in terms of both usage of capital intensive technologies and labour productivity.

UNCTAD (2002) in its export related success stories of PRC (People's Republic of China) and East Asian countries suggests that FDI is powerful tool for export promotion. Recognising the significant role of FDI the Indian government has allowed FDI freely in many sectors with automatic approval. FDI is allowed up to 100 percent since Nov. 2005 in most activities. It has reviewed policies to attract more FDI. As a result India is becoming a favourable destination for international investors.

Peter (2002) found that economic globalisation went along with booming FDI in developing countries, which were able to attract a rising share of world wide FDI inflows in the 1990s. He asserted that FDI is anything but a zero sum game, in which one country can attract FDI only at the expense of another country. Additional FDI is likely to take place when new investment opportunities emerge in countries opening up to FDI. They asserted that policy makers have to be aware that various measures intended to induce FDI are necessary. Privatisation needs to be complemented by competitive policy in order to ensure benefit from FDI. They argued that policy makers should refrain from expecting too much from FDI as they felt that positive growth effect of FDI cannot be taken for granted.

Liu and Wang (2002) studied the impact of foreign direct investment (FDI) on total factor productivity for a cross sectional sample of Chinese industrial sectors. They found that the phenomenal economic growth in China has been accompanied by a rapid increase in the inflows of FDI. An endogeneity test was performed by them in order to avoid inconsistent results. They have estimated TFP from production function. The findings from this study support the argument that attracting FDI is an effective way of introducing advanced technology to host countries.

Hsiao and Shen (2003) found that institutional strength and high levels of urbanization are conditions for positive effects of FDI on growth. They find a feedback association between FDI and GDP in their time series analysis of the data from China. Furthermore while assessing the role of the contribution of GDP growth to FDI, they found that the elasticity of one percent increase in GDP raises FDI by 2.117 percent.

Athukorala (2003) studied the impact of FDI on the economy of Sri Lanka using time series data from 1953 to 2002. Co integration analysis and error correction mechanism were used by the author to capture two way linkages between variables of interest. The regression analysis does not provide much support for the view of a strong link between FDI and economic growth in Sri Lanka. The author found the attitude of civil society towards FDI is positive but net attitude of foreign firms towards the investment climate in Sri Lanka is negative. The author concludes by suggesting improvement in investment climate of the country.

Javorcik (2004) remarked that many countries strive to attract foreign direct investment (FDI) hoping that knowledge brought by multinationals will spill over to domestic industries and increase their productivity. In contrast with earlier literature that failed to find positive intra industry spillovers from FDI, this study focuses on effects operating across industries. The analysis, based on firm-level data from Lithuania, produces evidence consistent with positive productivity spillovers from FDI taking place through contacts between foreign affiliates and their local suppliers in upstream sectors. The data indicate that more spillovers are associated with projects with shared domestic and foreign ownership but not with fully owned foreign investments. She observed that domestic capital participation in FDI projects lowers foreign investors' costs of using local suppliers and thus results in more local sourcing and greater productivity spillovers to domestic producers of intermediate inputs.

Lipsey and Sjöholm (2004) found that there exists a vast literature on every aspect of how inward FDI affects host countries, with little sign of convergence. They investigated whether it is the different statistical technique, the different countries that are being examined or is it because researchers are asking different questions under the same labels of wages, productivity or spillovers which show diverse result. They emphasised that the influence of the country and industry specific factors cannot be ruled out while taking note of positive spillovers of FDI in some countries. They also found that countries and firms within countries might differ in their ability to

benefit from the presence of FDI and their superior technology. There could be countries and industries in which the domestically owned sector is too small or backward to learn from foreign owned firms. A heavily protected domestically owned sector might be inefficient and lacking in entrepreneurship. Thus, they emphasised that with country and industry specific differences playing a decisive role regarding the impact of FDI, search for universal relationship is futile.

Blalock and Gertler (2004) studied whether domestic firm increase their productivity by supplying to multinationals. They constructed industry level proxy for backward linkages. They employed input output tables to measure the share of output of a particular sector that is sold to other sectors. They found the evidence of productivity gain among local firms from foreign entrants.

Mickiewicz, et al. (2005) in their study, examined the role of FDI in job creation and changing the structure of employment. For their study they considered four countries Czech Republic, Hungary, Slovakia and Estonia. They used descriptive stage model of FDI progression into Transition economy. They also analyzed the model from the perspective of employment. The study concluded that the role of FDI in employment creation has been more successful in Hungary than in Estonia. They found that the increasing differences in sectoral distribution of FDI based employment across countries are closely related to per capita FDI inflows. They have recommended bigger diversity of types of FDI, as they considered that it will lead to more diverse types of spillovers and skill transfers. They recommended favourable FDI policies to attract more FDI inflow.

Sahoo & Mathiyazhagan (2003) examined the role of Foreign direct investment (FDI) in promoting growth of the Indian economy via export promotion by using the annual data from 1979-80 to 2000-01. They used the Johansen co-integration test and found that there is a long run relationship between Gross Domestic Product (GDP), FDI and Export (Ex). The same relationship is also established when the index of Industrial Production

replaces GDP. However they found the positive elasticity coefficients between FDI, GDP and FDI, IIP are less than the positive elasticity coefficient between export (EX), GDP and EX IIP. It implies that EX plays a comparatively better role in the growth of the Indian economy than FDI. They concluded by advising to open up the economy to export oriented sectors so that a higher growth of the economy can be achieved through the growth of these sectors.

Yao and Wei (2006) examined the impacts of FDI on China by using Cobb Douglas production function which includes two basic input variables, labour and capital and a set of other environmental variables. They found that FDI has a positive effect on output and contributes up to 30% of total technological progress in China. Though the effect of FDI on economic performance was asymmetric across regions, it points out that the regional differences in technological progress and the existence of other co-operant factors deserves the attention of the policy makers.

MacDougall (2007) assessed the difference made to the real income of Australia by the presence of foreign owned private capital on the assumption that the economic forces have had time to work themselves out. The most direct gains to Australia has come through higher tax revenue from foreign profits through economies of scale, and various other spill over effects. The study pointed out that the fluctuations in the amount of foreign capital inflow may have affected balance of payment situation in Australia. The study concluded by suggesting some policy measures.

Liang (2008) has studied the impact of different types of FDI (wholly owned FDI or joint ventures) on the productivity of local firms in China. He has also explored how industrial linkages, firm capabilities and geographical location of domestic firms affect the diffusion of technology brought by foreign direct investment. He analyzed plant level data in China for over 20,000 plants for the period 1998 to 2005. He found positive productivity spill over between foreign suppliers and their domestic customers. The positive productivity spill over is more in case of wholly owned subsidiaries compared to joint ventures.

Karimi et al (2009) have tested the direction of causality between FDI and growth in Malaysia. They took time series data covering a period of 1970-2005 for Malaysia. Their findings based on the Toda-Yamamoto causality test suggest that there is no strong evidence of a bi-directional causality between GDP and FDI. They also conducted bounds tests (ARDL) and found that there is no long-run relationship between FDI and GDP in Malaysia. They conclude that attention needs to be given to the overall role of growth as a crucial determinant of FDI.

Adams (2009) argued that ‘the theoretical link between FDI and Economic Growth can be found in modernisation and dependency theories’. According to him modernisation theory suggests that since economic growth requires capital investment, FDI could serve as the engine to the economic growth. He emphasised on transfer of knowledge, managerial and marketing skills through FDI to the developing countries which lack it due to the scarce infrastructure. However, in stark contrast to modernisation theory, dependency theory suggests that if a nation depends on foreign investment, then its economic development would face a negative impact because FDI has the tendency of monopolising the industrial sector, which often results in underutilisation of local resources². Thus it leads to the conclusion that foreign investors dominate the domestic economy and thus the multiplier effect of FDI is weak and it leads to stagnant growth in the economy.

Adams (2009) reviewed the FDI economic growth literature in the context of developing countries and particularly Sub Saharan Africa. He conducted his study for the period 1982 to 2007. He has analysed the effects of FDI on economic growth from two perspectives, the development theory and world system theory. He found that FDI contributes to economic development of host country in two main ways, first it augments domestic capital and enhances the efficiency through the transfer of new technology, marketing and managerial skills innovation and best practices, secondly FDI has both benefits and costs and its impact is determined by the country specific conditions in general and the policy environment in particular in terms of the ability to diversify, the level of absorption capacity, targeting of FDI and

²See Adams' 2009.

the opportunities for linkages between FDI and domestic investment. The findings of the review suggest that FDI is necessary but not a sufficient condition for economic growth.

Kim and Park (2012) exploited international bilateral data set for the period 1963-1998 to investigate the relationship between foreign direct investment (FDI) and foreign educated labour and its impact on a host country. Workers educated abroad acquire country specific human capital that is more productive in the host country. A foreign subsidiary sharing a parent firm's technology will invest if it has more foreign educated labour, since it can utilize this labour more productively. The empirical findings of the study show that foreign –educated labour accounted for a sizable portion of growth in FDI inflows in a host country.

Apart from the above mentioned studies which indicate positive impact of FDI, other related work concluded that the impact of FDI on the economic growth of the concerned countries have been negative.

One such study was conducted by Kokko (1994) He found the effect of FDI for Mexico in the 1970s. The study found that local establishments labour productivity level significantly lags in industries characterised by complex technologies and high foreign share of production: Technology gaps paired with high foreign ownership reduce technology spill over.

Subramanian and Joseph (1994) found that out of 50 sample pairs of Foreign Controlled Enterprises (FCEs) and Local Controlled Enterprises (LCEs) compared on the basis of conduct and export performance ,foreign firms show poor performance relative to local firms in majority (30) cases. Export intensity of local firms is found to be better than that of foreign controlled firms.

Kumar (1994) tested the role of foreign affiliates in the export of manufactured goods, his study corroborates along with Subrahmanian and Mohanan Pillai, 1979, Lal and Mohammad, 1983 for India and Cohen 1973, 1975, for Brazil. He found that foreign firms have negligible economic benefits when compared to local firms producing and exporting same product.

Carkovic and Levine, (1998) used both panel and cross section data for 72 developing and developed countries for the period 1960-95 for analyzing the relationship between FDI and economic growth .They employed OLS and GMM methods of estimation. They failed to find the existence of the relationship between economic growth and FDI.

Konnings, (2001) after controlling for technological capability, found that in Eastern European Transition Economies the market stealing effect dominates at the initial stages of transition, which implies a negative spill over effect. He specially found no spill over for Poland and negative spill over for Romania and Bulgaria.

Katerina,et.al.(2004)in their research on the effects of Foreign Direct Investment (FDI) on economic growth mainly focused on the US and the western European countries. They investigated the existence and the nature of the effect of FDI on the rate of growth of a panel of transition economies. They applied Bayesian analysis and indicated that FDI does not exhibit any significant relationship with economic growth for the transition countries.

India related studies are also available in good number. These studies have also provided a mixed result. In one such study Kumar (1998) analysed the effects of transnationalisation of capital and impact of liberalisation on Indian industries. Taking into account the initial period after economic reforms 1991, this study supports the view that liberalisation is positively related to output and export growth but also cautions that challenge response, reduced price and increased efficiency are not the direct outcome of liberalisation. This study found a causality relation between FDI and other principal factors like availability of inputs, higher profitability of domestic sales to exports and large size of domestic market in India. He suggested for favourable FDI policies which will mutually benefit both developed as well as developing economies.

Balasubramaniam and Mahambare (2003) are of the opinion that FDI can be a catalyst but not an initiator of development. They considered that the 1991 economic reforms were a watershed in India's economic development strategy; it signalled a major departure in the FDI policy framework and removed many of the restraints on ownership and composition of FDI. The inflows of FDI increased appreciably during the nineties and they found FDI had an impact on growth, exports and productive efficiency of Indian industry. They found that optimum level of FDI depends on the stage of development of an individual country. Further, they recommended that on policy front India needs to be more flexible in order to draw more FDI.

Agarwal and Shahani (2005) in their study explored the impact of various type of FDI on the growth of an economy. They found that it is the quality of FDI that matters for a country like India rather than its quantity. FDI is often supposed to be higher quality if it is export oriented and induces economic spillovers benefitting local enterprises and workers.

Rajit Kumar Sahoo (2005) pointed out that FDI has a direct and as well as indirect impact on different sectors of the economy. It means it has differential effects and cannot be same for every sector. It found that the impact of FDI on chemicals, electricals and electronics shows direct impact, whereas FDI inflows in sectors like drugs and pharmaceuticals show indirect spill over effects. They found that FDI has the potential of casting long run positive effect on economic growth of India.

Chakraborty and Nunnenkamp (2006) revealed that the composition and type of FDI has changed considerably since mid 1990s. They found that although FDI in India continues to be local market oriented yet after the reforms its world market orientation has increased. They have used industry specific FDI and output data and applied causality test and found that increase in output has led to increase in FDI stocks. They found that manufacturing sector shows strong relation between output and FDI stocks compared to primary sector, where as in service sector this feedback effect is transitory. They conclude by suggesting policy reforms pertaining to FDI in order to maximise the benefits of FDI in India.

Sasidharan & Ramanathan (2007) examined the spill over effects from the entry of foreign firms using a firm level data of Indian manufacturing industries. Firm – level data of Indian manufacturing industries is used for the period 1994-2002. They considered both horizontal and vertical spillover effects of FDI. The study finds no evidence of horizontal spillover effects. However, the study finds negative vertical spillover effects.

Singh (2007) studied the performance of Indian economy in terms of foreign direct investment. He considered the period 1950 -2004 for his study. Further he divided the period into two parts: first from 1951-1980 and the second 1981-2004. In the first part the economic growth was more or less stagnant, popularly known as the period of Hindu Growth rate. He observed that in the second phase due to external sector reforms the structure of Indian economy showed a drastic transformation. He is of the view that FDI has played an important role in the economy. He suggested to follow China model of FDI policy to enhance economic growth, while shifting more investment to industrialize the rural sector of the Indian economy.

Prasanna (2010) explored the impact of FDI (Foreign Direct Investment) inflows on the DI (Domestic Investment) in India found that the direct impact of FDI inflows on DI in India is positive but the indirect impact is 'neutral' on the DI in the long run. The study finds no evidence that the increase in DI due to FDI inflows is greater than the amount of the FDI inflows in India.

Sarbapriya Ray (2012) estimated the effect of FDI on economic growth using co integration approach for the period 1990-91 to 2010-11. The empirical analysis based on OLS method suggests that there is positive relationship between foreign direct investment (FDI) and GDP and vice versa. The co integration test confirmed the presence of long run equilibrium. This study confirms the presence of uni-directional causality which runs from economic growth to foreign direct investment. It concludes with some policy suggestions for the government.

As it is clear the above mentioned studies have found positive impacts of FDI on Indian economy. However some of the studies mentioned in the following section have found negative effects of FDI on Indian economy.

One such study was conducted by Chakraborty and Basu (2002). They used time series data in context of Indian economy. They examined FDI and trade function as engines of growth. They found that trade and FDI liberalisation policies which began in India in the late 1980s and were widened in the 1990s, have increased economic growth. They however suggested that GDP in India is not caused by FDI and the causality runs more from GDP to FDI.

Carkovic and Ross (2002) revealed in their study that while micro economic studies give a pessimistic view of the growth effects of the foreign capital, macroeconomic studies find a positive link between FDI and growth. However, the authors say that the previous macroeconomic studies do not fully control for endogeneity, country specific effects and inclusion of lagged dependent variables in the growth regression. After reducing many statistical problems plaguing past macro-economic studies and using two new data bases, they find that FDI inflows do not exert an independent influence on economic growth.

Alfaro (2003) gave a mixed result of his study. He remarked that it is natural to assume that foreign direct investment (FDI) can convey great advantages to host countries. He found that the benefits of FDI vary greatly across sectors i.e. the primary, manufacturing, and services sectors. His analysis based on cross-country data for the period 1981-1999 suggests that total FDI exerts an ambiguous effect on growth. Foreign direct investments in the primary sector, however, tend to have a negative effect on growth, while investment in manufacturing a positive one. Evidence from the service sector is ambiguous.

Sahoo, D (2004) examined the impact of Foreign Direct Investment on the Indian economy .This study found that foreign firms may drive the local producers from business and substitute imported inputs. In such a situation, the foreign firms may not bridge the gap between domestic investment and

foreign exchange .The repatriation of profit by the foreign firms may drain out the capital from the country. This may lead to crowding out effect of domestic firm.

Johnson (2006) examined whether FDI has a positive effect on economic growth by sparking technology spill over .He used panel dataset consisting of 90 developed countries and developing countries for the period 1980 to 2002. He performed the empirical analysis by using the OLS method and concludes that FDI enhances economic growth in developing countries due to technology spill over but not in developed countries. The study also examines the impact of FDI on economic growth in primary, manufacturing and services sectors.

Moura & Foret (2010) reported that FDI influences the host country's economic growth through the transfer of new technologies and know-how, formation of human resources, integration in global markets, increase of competition, and firms' development and reorganization. Empirically, a variety of studies considers that FDI generate economic growth in the host country. However, there is also evidence that FDI is a source of negative effects. Given this ambiguity of existing results were in positive and negative effects of FDI have been emphasised, they reviewed literature on the subject, intending to shed light on the main explanations for the divergence of results in different studies. They found that the effects of FDI on economic growth are dependent on the internal conditions of the host country (economic, political, social, cultural or other). They concluded by suggesting that government of the host countries must put in efforts and generate the conditions that allow for the leverage of the positive effects or for the reduction of the negative effects of FDI on economic growth. Siddiqui, (2014). studied the role of foreign capital in the economic development of developing countries, particularly South Asian and East Asian countries. Mainstream economists view that foreign investment would benefit developing countries by increasing the availability of capital and through their positive impact over productivity and the general economic wellbeing of the host country. He cited the example that after the Second

World War, the rapid economic growth of Japan, South Korea, Hong Kong, Singapore, and Taiwan has been facilitated by foreign capital. He asserts that the positive impact is true when we look at the records in terms of the removal of poverty, job creation, and educational achievements and ignored the experiences of developed countries in their early phase of industrialisation. Further he found that there is a lack of attention to the analysis of the issue of capital inflows due to neoliberal economic reforms and financial deregulation. After the global financial crisis in 2008, capital inflows to developing countries have witnessed a sharp decline.

Thus the survey of literature done above regarding the impact of FDI on economic growth provides a conflicting view about the effects, as some of them identified positive effects while others recognised negative effects. There also lies gap in terms of coverage of growth variables and the time period. Further to add to this very few studies have been undertaken for India in the recent past. Consequently an attempt is made in this study to examine the performance of Indian economy with respect to various growth variables in order to fill the lacunae of the earlier studies.

2.2.2. *Impact of FDI On Trade Of Host Country :*

Foreign Direct Investment and International Trade are often seen as important conduit for economic growth of transition economy. It is widely acknowledged that MNEs, with their expertise and managerial skills and knowledge about prevailing international marketing conditions, are expected to improve the productivity as well as export performance of host country firms by creating certain positive externalities known as ‘spillovers’. Spillovers can take place when the productive efficiencies of firms in a host economy improve due to the presence of MNEs which compels them to improve their product cost, price and quality effectively in the international market and thus improving their export performance. Such spillovers may occur either to domestic firms in the same industry group of foreign firms through competition, known as ‘horizontal spillovers or to firms in the upstream supply chain through buyer-supplier linkages, known as ‘backward spillovers’. This aspect has also been examined by a number of researchers

Discussing about trade and FDI, Hymer (1970), Vernon (1966) and Caves (1971) talked about oligopolistic structure of markets, international integration, imports and the level of foreign direct investment as complementary to trade. Hymer asserts that MNCs possess a rent yielding asset also known as production know how which gives them edge over indigenous firms. Hymer attributed FDI to market imperfections. He saw FDI as a means of transferring knowledge and other firm assets, both tangible and tacit.

Bhagwati, Srinivasan and Wan (1978) were of the opinion that FDI inflows may worsen the country's terms of trade. They found that the country's trading mode decides what will be the effect of FDI. Liberal trade regime helps in inviting more FDI consequently spillover benefits are more.

Agmon (1979) argued that the factors that are likely to result in the emergence of MNEs are the same factors that encourage intra-industry trade; therefore the FDI and trade are complementary. He challenged the proposition of Mundell (1957) that FDI substitutes trade and found complementarities between FDI and trade.

Lucas (1993) found a positive relationship between FDI and foreign exchange reserves which a country earns due to the participation of FDI. This study also shows that political instability reduces the flow of FDI in the short run. This points towards good governance as a prerequisite for getting greater flow of FDI.

Zhang (2006) investigated the issue that views FDI as an accelerator of host countries' exports by using Chinese industrial data for the period 1980-2004. They used regression technique where FDI was treated as an additional factor to the conventional framework in which the country's export performance is determined by factor endowment and scale economies. The estimates indicate that FDI indeed has a positive impact on China's export boom where its effects are much larger than those of domestic capital.

Ahmed et al (2007) observed the short run and long run causal link between FDI and Export, FDI and growth and between export and growth in Sub Saharan African countries, using the new autoregressive distributed lag (ARDL) in the examination of a Granger type test of causality with an error correction .The result shows that bi directional Granger causality exists between FDI and exports in Ghana, Kenya and Nigeria. Further the causality runs from FDI to export in South Africa and from export to FDI in Zambia. A positive causal relation from exports and FDI to income is observed for all five African countries studied as indicated by the estimated co integrating vectors (only in case of Kenya a negative impact of FDI is found. The result provides evidence of a positive causal link and a long run impact of exports and FDI on income.

Hagemejer and Tyrowicz (2011) have evaluated the effect of FDI in the economy Poland with the help of firm level data for the entire population of medium and large scale firms for the period 1996 to 2008. Propensity score matching has been used by the authors to overcome selection problem. The result of the study demonstrates the foreign firms are indeed superior to domestic firms. In the case of efficiency, direct effects of FDI are robust, where as in case of exports, selection effect is more important, leading to a conclusion that foreign investment is concentrated in export intensive firms.

Harding and Javorcik (2011) present complementary evidence suggesting that FDI can help developing-countries enhance their exports along with catching up with their quality frontier. They find that products exported by multinationals have higher unit values due to their superior technology and marketing techniques. Secondly, local firms in the same industry may learn by observing and thus upgrade the quality of their own exports. Thirdly, productivity spill over to supplying firms may result in suppliers exporting higher-value products. Fourth, availability of higher-quality inputs resulting from FDI spillover accruing to the supplying industries may benefit indigenous producers of final goods and allow them to upgrade their exports. Thus FDI leads to spillover effects.

Rahmaddi & Ichihashi (2012) investigated the sector based impact of inward FDI on Indonesia's exports using disaggregated data of manufacturing sectors categorised by factor intensity from 1990 till 2008. Employing panel and differentiated cross-section data analysis they found that FDI inflows significantly improve manufacturing exports. This effect is even stronger in capital and technology intensive sectors, without any significant evidence of a crowding out effect in natural resource and unskilled labour intensive industries where Indonesia has a comparative advantage. The study concluded with some policy implications.

Yasin (2013) explored the role played by FDI in improving export performance of Pakistan and also compared it with imports. He found that GDP growth of Pakistan has improved due to FDI. This study comprises of annual observations and its data cover period from 1976 to 2010. ARDL model is applied to examine the secondary data to examine the long run relationship between depended and independent variables. The results of the study show that there is no long run relation between depended and independent variable. The author recommended policy measures in the light of the results obtained, regarding FDI in Pakistan.

There are studies which also show that the effect of FDI on trade of host countries had been negative and they also found the effect to be mixed.

Barrios et al (2003) studied the case of Spain and found no evidence of export spillover to local firms from the existence of MNCs.

Ruane and Sutherland (2004) experienced the same in case of Ireland that existence of MNCs does not lead to any export spillover to foreign firms. To investigate how export decisions of host-country enterprises are associated with the presence and export intensity of foreign-owned enterprises (FOEs) in an export-platform economy they used enterprise-level data for the manufacturing sector in Ireland. They postulated that export spillovers from FOEs are dependent upon the sectoral presence and export intensity of FOEs, so that third-country export-platform FDI may not result in positive export spillovers to host-country enterprises. They found that the decision by

host-country enterprises to enter the export market is positively associated with the presence of FOEs in their sector. However, the export intensity of host-country enterprises is negatively associated with the export sales ratios of FOEs.

Barrios, et.al (2005) analysed the impact of foreign direct investment (FDI) on the development of local firms and found a mixed result. They focused on two likely effects of FDI: a competition effect which deters entry of domestic firms and positive market externalities which foster the development of local industry. Using a simple theoretical model to illustrate how these forces work they showed that a number of domestic firms follows a u-shaped curve, where the competition effect first dominates but is gradually outweighed by positive externalities. They specifically, applied semi-parametric regression techniques on plant level panel data for the manufacturing sector of Ireland and found that while the competition effect has initially deterred local firms' entry, this initial effect has been outpaced by positive externalities making the overall impact of FDI largely positive for the domestic industry.

Kinuthia,(2010)found that attracting foreign direct investment (FDI) inflows has been a major concern of most governments in developing countries as FDI is believed to bring many benefits to the host countries in terms of productivity, employment, technology among others. He investigated the existence of export spillovers and the channels of transmission of such spillovers in Kenya for the period 2000-2005 using firm level data. Using the Heckman selection model, he found there is evidence of demonstration effects on the domestic firms export decision but not on their export propensity. There is also evidence of negative spillovers from competition and the information channels on both the decision to export as well as the export propensity. There is need to increase FDI participation in the manufacturing sector, as well the introduction of policies to mitigate effects of negative spillovers that may arise.

In India also studies have been conducted to examine the effects of FDI on trade.

In one of the earliest studies Balasubramanyam, Salisu and Spasford (1996) stressed that openness to trade is essential or reaping positive growth of FDI.

Aggarwal (2001) tested the hypothesis that in the liberalised regime MNE affiliates perform distinctly better than local firms in the export markets along with analyzing the inter firm determinants of export performance in Indian manufacturing in the late 1990s. She used the sample of 970 firms pooled together under 33 industries for the period 1996-2000 and Tobit model (Tayyebi) of estimation was conducted on all these industries. This supported the hypothesis that MNE affiliates perform distinctly better than local firms ,however this evidence is not strong enough to suggest that India is attracting efficiency seeking export oriented FDI. Even firms with high equity shares have not performed distinctly better than others.

Kumar and Pradhan (2003) looked at the important factors that influence the export competitiveness of Indian manufacturing firms with emphasis on knowledge-based industries. They found that younger firms drive export competitiveness in the high technology and low technology industries whereas in the medium technology industries older firms are more competitive. The study also found that foreign affiliates are better achievers on export front compared to their domestic counterparts in Indian manufacturing. The study concluded that the liberalization policies of 1990s have definitely improved the export competitiveness of Indian manufacturing, especially technology-intensive segments.

Pradhan and Abraham (2005) used a simple Tobit analysis for observing foreign equity participation in selected countries for the period 1991 to 2001. They found that foreign firms having 40-55 to 65-75 per cent of ownership tend to export more as a percentage of sales than any other group. They found that firms with modest levels of foreign equity participation have shown higher export performance following the implementation of economic reforms (1991) in India. However, firms with majority foreign

ownership have not yet shown any significant improvement in their export behaviour, supporting the earlier findings that firms with larger foreign equity participation in Indian manufacturing are relatively local market oriented. They also found that the government schemes of export promotion were also instrumental in the export performance of foreign affiliates.

Pradhan et. al. (2006) in their study have addressed the issue of how to motivate the market-seeking FDI to undertake export oriented activities from the host country. They also identified those factors which motivate market-seeking FDI to undertake export related activities. They conducted the analysis in two stages. In the first stage, they estimated the export shares and export-orientation of foreign firms in the manufacturing sector across 17 Indian industries for the period 1991–2005. In the second stage, they analyzed the impact of factors like size and growth rate of host country market, local competition, policy regime, import competition and industry specific -characteristics on the export-orientation of foreign firms in Indian manufacturing. The study concludes by raising several policy based issues for increasing export-orientation of foreign firms in India.

Prasanna (2007) studied the export performance of developing countries. He used multiple regression analysis. He found that inward FDI has significantly contributed to improve the export performance of India between the period 1991-92 and 2006-07. However he found that Indian manufacturing has not contributed significantly in enhancing their export performance during the same period in line with similar findings by UNCTAD (1999). He concluded by stressing on proactive policies to build a more sustainable and dynamic export base by host countries.

Dash (2007) employed Toda-Yamamoto, Granger non-casualty test to find the direction of causality between FDI, IIP (Index of industrial production) and Trade. They examined multivariate causalities among these three variables. They used quarterly data published by IFS for the period 1990 to 2005 for their analysis; Co integration test substantiated the long run relations between variables, while the Toda-Yamamoto causality test

suggested that FDI has favourable growth effects. They found that causality is running from export to FDI and not vice versa. Role of FDI in export promotion could not be substantiated by their study. However, there exists a complementary relation between FDI and import.

Rani and Dhanda (2011) found that the cause and benefit effect of FDI is different in different countries. They estimated and analysed the impact of FDI on trade, foreign exchange and capital formation in India using simple regression technique with FDI as an independent variable for the period 1991 to 2009. They found that a greater inflow of foreign capital has led to growth in export of goods and services and growth in foreign exchange reserves in India over the period of study.

Gosh & Roy (2012) analysed the effects of foreign direct investment on firm level export performance across manufacturing sectors in India. They found that improvements in export competitiveness vary with varying levels of FDI and MNC participation across sectors. Further, the evidence of inter firm variations in export performance across sectors is indicative of the existence of factors specific to firms. He used a firm specific model for estimation of export performance. Panel data showed the presence of export spillovers from foreign to domestic firms in some manufacturing sectors.

Some of the other work done in this area concluded that the effect of FDI on trade of developing countries including India is negative.

Veeramani, (2003) revealed an inverse relationship between intra-industry trade and involvement of multinational in the industry. He argues that foreign investment in India is mostly horizontal in nature rather than vertical.

Sharma (2000) and Banga (2003) found that FDI has not played a significant role in export promotion, but pointed that export effects differed between home countries of foreign investors and between traditional and non traditional export industries. Thus the source country and the sector to which it flows really have a decisive role.

Joesph and Reddy (2004) concluded from their study that there exists a significant spillover from the presence of foreign firms to influence the export performance of domestic firms. They studied manufacturing establishments from 35 three digit NIC (National Industry Classification) industries for the period 1993-2004 of India. They used econometric models to estimate the effect of FDI on firm level export performance. Since export behaviour of a firm is also affected by other firm specific and industry specific factors, they have included some of those factors in export determining model of their present study. The study found that India has attracted more domestic market seeking FDI than export oriented one; the analysis of the present study does not support any backward linkages due to MNEs sales or their exports in any of the time periods after the liberalisation. The study confirms the findings of Srinivasan (1998) that India's factor market, including infrastructure sector, is less efficient compared with many of these countries with whom India competes in the international markets, which make it less feasible to exports. The study concludes that India's SEZ policy will improve.

Kuntluru & Muppani (2012) analysed the impact of FDI on export performance of the pharmaceutical industry in India. They using panel data analysis examined the hypothesis and found a negative impact of foreign ownership on export performance. They conclude that foreign firms are more interested in focusing on the domestic market rather than export market.

As it is evident from the above mentioned studies conducted in the field of FDI and its impact on foreign trade of a host country, that they are indecisive in nature and give mixed results. While some of these studies have confirmed a complementary relationship between foreign trade and FDI, others have explored crowding out effect of domestic firms due to the presence of FDI. Moreover the coverage in terms of period of study is also very uneven and sporadic. Further very few studies have been conducted for India. This study makes an attempt in this direction to fill in these gaps. In the subsequent section, impact of FDI on R&D activities has been taken into consideration.

2.2.3. *Impact of FDI On R&D Activities Of Host Economies :*

The process of globalisation has considered the importance of TNCs as knowledge diffuser. The policy makers and advocates of the globalization have stressed that by attracting TNCs, developing countries may have access to technologies of advanced countries. Technical advancement based on technological learning is essential for economic growth of transition economies. Globalisation has led to competition among the developing countries to attract MNCs to their economies in order to access high end technologies; since research and development (R&D) related activities mostly take place in the home countries of MNCs. This in turn will help to enhance their productivity. The strength of FDI knowledge spill over effects depend on the innovation supporting assets and absorptive capacity in the host country. The increasing recognition of India's locational advantages in knowledge-based industries has led to increasing investments in software development. Global R&D centres have been set up in India to exploit these advantages. R&D related foreign direct investment (FDI) has grown significantly in recent years. The existing literature supports the view that inward R&D – intensive FDI constitute a powerful mechanism of international technology transfer which can enable host locations to develop specialized clusters and integrate more advantageously in global value chain³.

Foreign controlled subsidiaries are now seen by most governments as a central actor of national innovation systems and the competition among regions and countries for owning international R&D has grown accordingly⁴. It is very difficult to obtain breakdown of R&D intensive FDI by mode of entry, but the existing literature suggests that most of the time it is through brown field projects/subsidiaries rather than through green field investments that R&D intensive FDI is undertaken at least in developed countries. When R&D intensive FDI occurs through transnational M&As, the only short term effect for the host country is a change of ownership but in the medium to

³See, Jose Guimon,

⁴ Mudambi and Mudambi , 2005; Zanatta et al, 2006

long run policymakers should weigh the potential benefits in terms of foreign knowledge transfer against the risk that the acquirer ends up reducing the subsidiary's R&D mandate to avoid duplicities with other existing units. Normally, governments are not interested in promoting this kind of FDI in R&D but rather may want to protect their "National champions" from foreign acquirers (Archibugi and Iammarino, 1999). Understanding how multinational enterprises (MNEs) decide about their R&D location is imperative for taking R&D related policy decisions.

A TNC can encourage technical change and technological learning directly through the transfer of new technology and organisational skills to its affiliates. The direct effect of this technology transfer enhances productivity, exports, R&D expenditure and industrial structure. It also expedites the rate of technical change through technology spill over from foreign subsidiaries to domestic enterprises. Technological spill over occurs because TNCs upgrade the technology of the affiliates that is better than what is available in the host country.

R&D-intensive FDI emerges from an evolutionary process whereby the manufacturing or marketing units already located in the country get engaged in R&D after some time and later may increase the quality and scope of their R&D. It is very important to understand various determinants which drive Multinational Companies to locate their R&D units abroad. This helps in the formulation of various R&D related policies. Indian policy makers have lately stressed on the need to attract higher quality of FDI instead of higher quantity of FDI. The focus of policy makers has been to attract FDI into activities involving research and development. Government in India is giving preference to the sectors involving high technology while allowing the inflows of FDI. FDI in these sectors enjoys the benefits of tax holiday, tax incentives and access to infrastructure facilities. To maintain competitiveness in the era of globalisation internationalisation of R&D is considered an important channel. The change in attitude of Multinational Corporations is evident from recent R&D operations carried out by them outside their home base, particularly in China and India and other emerging economies. According to endogenous growth theory, FDI influences growth

via variables such as R&D and human capital³. Technological spill over can occur via Multinational Corporations upgrading the technology of its affiliates (FIEs) to a level that is typically better than the technology available in the host country. However the R&D system prevailing along with the quality of its human resource and the absorptive capacity in the host economy decides the technological progress in the economy as a whole. Generally it is believed that FDI has a significant positive impact on the overall innovation capacity /efficiency of a host economy. In India foreign subsidiaries do not focus on technology absorption instead they try to customise the technology of their parent company according to the need of local market. Not all MNCs activity leads to technology transfer and positive spill over; it can sometimes also have negative impact on the direct transfer of technology to the foreign affiliates and reduce the spill over from FDI in the host economy⁵. The least developed countries learn very little from MNCs because of substantial technology gap. As Borensztein et al (1998) found that the effect of FDI on host country growth is dependent on stock of human capital.

It is against this background that an attempt has been made in this section to analyse the performance of FDI related R&D.

Odagiri's (1983) study, based on a sample of 370 Japanese manufacturing firms, analysed the effect of technology imports on domestic R&D efforts. Technology imports were measured as payments made as royalties. Even though he found a complementary relationship between technology imports and R&D, the results were statistically insignificant for certain industries.

Tsou and Liu (1994) analyzed the relationship between labour productivity, technical efficiency, and the spillover effect, using data from Taipei, China industrial and commercial census data collected in 1986 and 1991. They also divided the sample into a group with a relatively low technology gap between FDI and local firms, and a group with a higher technology gap between FDI and local firms, based on the average value of the ratio

⁵See, economic survey of Europe 2001No.1

between value added per employee in local and foreign firms. The results showed that in those sectors where technological gap between foreign plants and locally owned plants is low the spillover is positive, whereas in the sectors where the technological gap is more the spillover benefits are less.

Braga and Wilmore (1991) analysed the impacts of technology imports on the R&D performance of domestic firms. They used cross sectional data for 4,342 Brazilian enterprises. The empirical results showed that technology imports have a positive effect on domestic R&D efforts of firms. They also found that R&D efforts of a firm depend significantly on firm size, exports of firm, technology imports and foreign equity participation.

Lee (1996) analysed the impact of technology import on indigenous innovative activity of Korean firms. They used two stage selectivity bias correction method. The study estimated a probit model in the first stage for all the firms; the second stage analysis was confined only to those firms with R&D activities. This study found a substitution effect between technology imports and R&D efforts of domestic firms.

Belderbos et al (1996) found that R&D in foreign affiliate and technology transferred from their parent firms are important technology drivers of productivity in host countries. In this paper they examined the simultaneous impact of local R&D and intra-firm international technology transfer on productivity growth in foreign affiliates. They estimated a dynamic productivity model on a large sample of Japanese manufacturing affiliates worldwide in 1996-1997 and 1999-2000, they found that both affiliate's R&D and intra firm technology transfer contribute to productivity growth, while technology transfer exhibits decreasing marginal returns. It also found that the two sources of technology are complementary.

Chuang and Lin (1999) studied the impact of FDI on R&D efforts of domestic firms. They took a sample of 8,846 manufacturing firms in Taiwan province of China. They used a Heckman two stage estimation to correct for the selection bias and found a substitution effect between the two. This may be due to the absence of inventive activity by the MNCs in the host country as they acquire it from the parent firm.

Pearce and Papanastassiou (1999) noted two important strategic roles performed by multinationals firms R&D labs: customise the multinational's existing skills for use in the host market and to conduct specialised research in those areas in which the host market is particularly skilled. This proves that domestic firms are also actively involved. This indirectly points towards a stage of development of domestic firms and also their level of R&D activities.

Kuemmerle (1999) shows that differences in R&D intensity between home and host industry strongly determines whether multinationals establish R&D laboratories to exploit existing skills or to augment existing skills with new skills, augmenting skills is more likely when the host nation is relatively more R&D intensive.

Damijan et.al (2003) explored 8,000 firms from ten advanced transition countries in order to uncover the importance of FDI and its impact on productivity growth of local firms. In addition to direct effects, they have also distinguished between intra industries (horizontal) and inter industry (vertical) spillover from foreign owned firms. The importance of different channels of technology transfer is estimated by using the unique firm level database adopting growth accounting approach. To correct selection bias Heckman's two step procedure is used. They used GMM (general methods of moment) approach to estimate augmented production function at firm level. They conclude that vertical spillover is larger than horizontal spillover.

Bran letter & NBER (2003) examined the impact of FDI on innovative capacity of the host country. They noted that FDI is an important channel for such knowledge spill over. Using an original firm level panel data set on Japanese firms FDI and innovative activity, he found evidence that FDI increases the flow of knowledge spill over for Japanese multinationals undertaking direct investments in the United States.

Morris (2004) explored that Foreign Direct Investment (FDI) and research related activities by U.S owned companies in China expanded substantially during 1990s especially in the information technology sector. U.S affiliates in China were among the most R&D intensive overseas affiliates in 2000. This study used FDI data from the U.S Bureau of Economic Analysis and the database of Thomson Financial. It found that the frequency of new U.S China industrial R&D alliances declined after the mid 1990s in contrast with an increase in U.S majority owned affiliates and R&D expenditure in China. R&D alliance is complementing a growing technology intensive manufacturing base by U.S MNCs in China.

Todo & Shimizutani (2005), this study distinguished between the determinants of overseas innovative and adaptive R&D using micro level dataset on Japanese overseas subsidiaries. Empirical investigation of the study is based on a multinomial logit model. The result of the investigation suggests that overseas innovative R&D aims at the exploitation of foreign advanced knowledge, whereas primary role of adaptive R&D is to adapt products and technologies to local conditions using parent firms' existing knowledge when the local market is large. Other important factors affecting overseas R&D decisions are subsidiaries size, age, experience, geographical proximity to Japan.

Baskaran and Mulchie (2008) examined the links between a country's NIS (National Innovation System) and its ability to attract FDI and R&D (Research and development). Developing countries that demonstrate strong capabilities in those industrial sectors where MNCs have invested heavily in their home countries are likely to attract FDI in R&D. Increasing R&D operations in developing countries by MNCs are unlikely to displace significant R&D infrastructure and employment in their home countries. FDI in R&D have helped develop research and knowledge in BRICS economies but it is more varied and complex in different BRICS economies. The policies to strengthen various components of NIS are recommended and also efforts to create strong linkage with local economy are recommended.

Sizhong (2010) by utilising a comprehensive firm level data set from China investigated the determinants of R&D behaviour of both domestic and foreign firms, with a particular focus on the role of entry of foreign firms. A simple Cournot model shows that foreign entry exerts different impact on domestic firms' R&D and foreign firms' R&D likelihood and intensity, which is largely supported by the data used by them. They find foreign firms entry in China positively and non- linearly affects domestic firms' R&D likelihood and intensity and negatively and nonlinearly affects foreign firms' R&D likelihood and intensity.

The entry of foreign firms is not without any negative effect or consequences. Ait ken and Harrison show that the presence of foreign firms can crowd out domestic firms due to excessive pressure of competition. The domestic firms may be forced to move up along the average cost curve due to decline in the output. Reverse labour turnover can occur from the domestic firms to foreign firms .Since the foreign firms pay higher wages compared to the domestic firms, some workers of the domestic firms and join Multinational Companies. Similarly foreign firms may be reluctant to establish linkages with domestic firms.

One such study was conducted by Veugelers and Van den Houte (1990) they studied the effects on the R&D activities of domestic firms in the presence of foreign subsidiaries. They developed a game theory approach to analyse the effect on a sample of 47 Belgium firms over a period of three years. The econometric estimations showed a negative effect on domestic firms, due to the presence of foreign firms.

In the following section impact of FDI on R&D activities of Indian manufacturing firms, are presented.

One of the earlier studies examining the role of technology imports and R&D activity was by Katrak (1985).The study was based on industry level data for a period of three years (1975-77). The results of the study found a complementary relationship between technology imports and R&D. He also observed that Technology brought by MNCs might not be suitable for local

conditions, factor specific reasons. Furthermore the existing raw materials and other resources in a host country are not similar to what exists in the home countries of MNCs that are origins of FDI. Hence, some adaptive research and development must be undertaken to remodel such imported technologies to local conditions in order to reap the benefits of such imported technology

Kumar (1987) studied the effect of technology imports on domestic R&D by using cross section data for 43 countries for the period 1978-81. The study also considered FDI as means of technology transfer in addition to the technology imports through licensing .The study reveals that most of the time FDI acts as a substitute for domestic R&D. The study reveals a complementary effect in the case of licensing firms.

Siddharthan (1988) analysed the role of technology imports through licensing and local R&D activities undertaken in lieu of hefty payments. The study used cross sectional data of 166 firms belonging to six manufacturing industries. The study found a complementary relation between domestic R&D activities and technology imports through licensing. The study however revealed that in private sector units this relation was more profound than in public sector units.

Deolalikar and Evenson (1989) analysed the determinants of R&D (research and development) activity in Industries. They used patents as an indicator of technology imports instead of using the R&D expenditure as a proxy for innovative activity, which was done in the pre-reform studies. The empirical analysis was based on a demand system framework (generalised quadratic cost function) for 50 manufacturing industries during the period 1960-70. The study found a complementary relationship between technology purchase through FDI and R&D activity.

Subramanian and Pillai (1988) found that foreign companies operating in India spend less on R&D compared to domestic industries. The government has been spending increasingly large resources for R&D and that India has acquired the capacity to innovate in the field of Standard modern technology

but is very weak in science related technology. They found that India has not followed adaptive research, internalised learning, and capability up gradation of the imported technology. It concludes that accumulation of technology should be a continuous process from within rather than being dependent on a foreign company every time a new product has to be launched.

Basant and Fikkart (1996) analysed the role of technology purchase on in house R&D activities. The study used firm level panel data for the period 1974-82. The technology purchase was measured in terms of licensing fees, in the form of lump sum payments, royalties and technical fees. The analysis yielded a substitution effect between foreign technology purchase and domestic R&D activities.

Chugan (1999) investigated the factors related to foreign technology and their role in determining the firm's development, adaptation and absorption (DAA) capabilities. The study reveals that while the number of foreign collaboration agreements (FCA) and foreign equity do influence DAA capabilities, but other technology transfer related factors actually limit the firm's freedom to operate in an independent manner. The study indicates that in spite of weaker R&D base, the non FCA units spend more on R&D in relative terms and develop or adapt larger numbers of product than the FCA units.

Feinberg and Majumdar (2001) examined whether knowledge spillovers from MNCs' local R&D activities benefits domestic firms in the Indian Pharmaceutical industry from 1980-1994. They found that in a policy environment which restricted FDI and provided weak intellectual property protection the only significant R&D spillovers in the Indian pharmaceutical sector were between MNCs and each other.

Srivastava (2001) studied the technical efficiency of MNC affiliates and domestic firms for the period 1980-81 to 1996-97. She reported a decline in the mean efficiency during the 1990s compared to the pre-liberalisation period of 1980s, this result is similar to that of Das (2003). The result of the

study shows that for the Indian manufacturing sector taken as a whole the average efficiency levels had declined over the period 1991 to 1996.. However, after 1996 the average efficiency has improved though marginally. On the other hand, there were inter-industry differences. In the second part of the paper she used the efficiency estimates as the dependent variable in the regression exercise. Separate regressions for each of the years from 1991 to 2001 have been run to explain the factors affecting these efficiency estimates. The results show that foreign ownership or MNE affiliation was significant in explaining efficiency and the value of its coefficient increased over the years. Furthermore, among the domestic firms, (not affiliates of MNEs) non-equity strategic alliances, captured through royalty payments for imported technology emerged important. This variable was not important in the early 1990s but emerged significant in the second half of the 1990s. Capital intensity of domestic firms was also considered as an important variable. Thus domestic firms which imported technology and MNE affiliates emerged more efficient than the rest.

Goldar, et al (2003) analysed the effect of 'ownership' on the efficiency of engineering firms in India in the 1990s. They estimated technical efficiency of firms with the help of a stochastic frontier production function using parametric techniques. A comparison of technical efficiency is made among three groups of firms in Indian engineering: (1) firms with foreign ownership, (2) domestically owned private sector firms, and (3) public sector firms to find solutions to two questions: whether the technical efficiency of foreign owned firms generally higher than that of domestically owned private sector firms and public sector firms in India and secondly could the domestically owned firms catch up with the foreign firms in terms of technical efficiency during the 1990s. They found that the average technical efficiency of foreign firms is higher as compared to the domestic firms, both in private and public sector. Their results also indicate that there has been a process of convergence in technical efficiency among Indian engineering firms during the 1990s – the domestically owned firms tending to catch up with the foreign firms in terms of technical efficiency although this process declined during the second half of nineties. Thus this study

reconfirms the higher efficiency levels enjoyed by MNEs and their affiliates and at the same time shows the narrowing of the gap between the two groups over the years. The narrowing of the gap does indicate the existence of spillovers from MNEs to the domestic firms. Furthermore, this study establishes a positive relationship between the trade and the efficiency of the Indian enterprises.

Banga (2003) in her paper concentrates on the issue of source of FDI and its impact on productivity of the domestic firms. She carried out Productivity growth in the Indian manufacturing sector for Japanese-affiliated, US-affiliated and domestic firms in three broad industrial categories, where both Japanese and U.S firms are significantly present, namely, automobiles, electrical and chemicals for the period 1993-94 to 1999-2000. She carried out the estimations at three levels. First, TFPG is estimated using “time-variant firm specific” technical efficiency approach (parametric approach) and average TFPG in the Japanese-affiliated firms is compared to that in the US affiliated and domestic firms. Second, the impact of the source of affiliation (origin of the affiliates) on TFPG of a firm is estimated using least square regressions on seven-year averages. Finally, to investigate to what extent inter-firm differences exist in explaining TFPG and to what extent TFPG in a firm is explained by technical progress and efficiency growth, Data Envelopment Analysis(DEA) is carried out. Her results show that different -origin of foreign affiliates lead to differential impact on TFPG of a firm. She finds that Japanese affiliates enjoy higher productivity growth compared to the U.S affiliates. Total factor productivity growth can occur either due to technological progress or due to efficiency improvements in the firm. She uses DEA to find that Japanese in affiliated firms are efficiency inclined whereas the US-affiliated firms are more into technological progress.

Kumar& Aggarwal (2005) analysed the technology behaviour of MNCs and Indian firms during the reform period. They made use of firm-level data for the 1992-1998. The panel data analysis states that there was a complementary relationship between technology imports and R&D during liberalisation period.

Kathuria and Das (2005) studied the role of FDI as a means of technology transfer to analyse R&D efforts of domestic firms. They used firm-level data for the time period 1996-2001. Additional analysis was carried to understand the determinants of R&D efforts of domestic firms. The study found a substitution effect between FDI and R&D in the latter period.

Adamou and Sasidharan (2007) attempted to understand the role of R&D and FDI, in determining firm growth. They used fixed effects panel data models with GMM estimation to control endogeneity of R&D and FDI. The study found that an increase in current R&D induces a higher growth, whereas an increase in FDI induces higher growth in some industries and lower size growth in some industries. They found that the absence of learning effect is the main difference between emerging- developing and developed countries.

Mrinalini and Wakdikar (2008) observed that with new emerging trend of Internationalisation of R&D, MNCs are targeting developing countries in Asia for setting up their dedicated R&D centres. The skilled manpower and the reasonably developed S&T infrastructure have been drawing MNCs to India for setting up their dedicated R&D centres. As more and more R&D centres are operating in India it is expected that it will have some positive effect on the Indian economy. It concludes by proposing a detailed investigation into the dynamics of interaction between foreign R&D centres and the local production and R&D activities, to understand the positive effects.

Pradhan and Singh (2008) conducted a study on OFDI. The work examined the issues for the Indian Automobile industry, which is currently transnationalizing at a rapid rate in terms of both exports and OFDI. This study suggests that those Indian firms which have OFDI are likely to conduct more R&D compared to those firms which do not have OFDI. This work also reveals that those companies that manufacture Auto Component spend less on R&D as compared to those companies which manufacture vehicles.

Marin and Sasidharan (2010) found that the pipeline –model used to explore the possibility of FDI –related spillovers typically ignore the potential role of subsidiaries’ heterogeneity in the process of spillovers generation as subsidiaries are playing an increasingly important role in the process of knowledge creation at present. They distinguished between two types of subsidiaries ‘competence creates creating’ and ‘competence exploiting’. They found that only subsidiaries that are oriented to technically creative activities have positive effects in India.

Some of the studies conducted in India also found negative effects of FDI on R&D activities of Indian firms.

Feinberg and Majumdar (2001) found that MNCs conduct R&D activities in their foreign affiliates to obtain access to the private knowledge created by local firms. Also it was found that Indian firms are more R&D intensive than the MNCs’

Kathuria (2004) analysed the impact of increased FDI flows on the R&D investment of manufacturing firms in medium and high tech industries in India. This was tested for two time periods, 1994-1996 and 1999-2001. The analysis covered seven industries including pharmaceuticals, automotive components and electrical equipment. The present analysis show that in the first period the inflow of FDI had a negative impact on R&D investment by Indian manufacturing firms but no significant effect in 1999-2001.

Javorcik et al (2004) argued that foreign affiliates that have a higher level of technology prefer wholly owned subsidiary rather than joint ventures, in order to maintain their competitive edge. A joint venture arrangement may increase the risk for undesired leakages of the MNEs technology and knowhow as the domestic partner may use the inside information in the production of other goods where it doesn’t collaborate with the MNE. Foreign investors naturally prefer arrangements that prevent spill over.

Another study by Banga (2005) demonstrates that FDI, trade and technological progress have differential impact on wages and employment. While higher extent of FDI in an industry leads to higher wage rate in the industry it has no impact on employment. On the other hand, higher export intensity of an industry increases employment in the industry but has no

effect on its wage rate in the industry. Technological progress is found to be labour saving but does not influence the wage rate, whereas domestic investment intensity has been labour utilizing in nature. She concludes by remarking that import of technology has an unfavourable effect on employment in India.

Ray and Venaik (2008) looked at MNCs subsidiary activities from a perspective of local stake holders. They found that the MNC subsidiaries in India make relatively weak contribution in terms of their R & D and export intensities and have higher level of royalty outflows. The result of the study indicates that the MNCs do not seem to achieve the level of knowledge creation and intellectual property generation sought by local subsidiary stakeholders and also MNCs do not share high level roles with their subsidiaries, which diminish the ability of subsidiaries to attract and retain talented employees undermining MNCs competitive advantage locally and globally.

Mrinalini et al (2012) analysed the impact of R&D strategies of MNCs in India by conducting primary survey during 2008-09 as a part of a Technology Information, Forecasting and Assessment Council (TIFAC) – supported project on the impact of the presence of MNCs R&D centres on the Indian R&D and production system. They surveyed 706 foreign firms which invest in R&D in India. They found that the MNCs do not have many linkages with the Indian institutions. This means that for a new product development or any scientific or technological research input they are not looking towards Indian production and R&D system. The patent data analysis show that firms are not into high- end R&D.

The survey of literature conducted above regarding the impact of FDI on domestic R&D, innovation capabilities and productivity in a developing country provides varied views which are at times contradictory in nature. Further, most of these studies have taken into consideration R&D in manufacturing sector in general .Very few studies have been conducted specifically in the field of automotive sector. Moreover studies pertaining to India in the recent past are also very less in number. It is this lacuna that the present study attempts to fulfil.

2.3 CONCLUSION:

In this chapter review of the literature related to Foreign Direct Investment and its impacts on various areas has been done. Foreign capital has emerged as the most important source of external resource flows to developing countries over the years and has become an important part of capital formation in these countries. During the decades of 50s and 60s MNCs of U.S were the main drivers of the world FDI followed by European and Japanese MNCs in the subsequent decades. It is widely acknowledged that MNEs, with their expertise and managerial skills and knowledge about prevailing international marketing conditions, are expected to improve the product and factor productivity as well as export performance of host country firms by creating certain positive externalities known as ‘spillovers’. FDI inflows could contribute to growth rate of the host economy by augmenting the capital stock as well as with infusion of new technology. In this context it was considered important to examine the impact of FDI on economic growth in India as India has been an important recipient of global FDI inflows. There exist conflicting views about the effects as some of them identified positive effects while others recognised negative effects. Similarly when the effect of FDI inflows on trade was reviewed it provided mixed result. Some of these studies have confirmed a complementary relationship between foreign trade and FDI, as the presence of foreign firms has boosted exports from these countries by improving the quality of the products being manufactured while others have explored crowding out effect of domestic firms due to the presence of foreign subsidiaries. The policy makers and advocates of globalization have stressed that by attracting TNCs, developing countries may have access to technologies of advanced countries as technological learning is essential for economic growth in transition economies. Thus R&D related foreign direct investment (FDI) has grown significantly in recent years. In this context the literature was reviewed to examine the effects of FDI inflows on R&D activities of host countries. The survey of literature regarding the impacts of FDI on domestic R&D, innovative capabilities and productivity in a developing country provides diverse views, as some of the studied found a positive impact of FDI inflows

on local R&D capabilities, on the other hand other studies found that the entry of foreign firm is not without any negative effect or consequences. They argued that the presence of foreign firms can crowd out domestic firms due to excessive pressure of competition. From the preceding discussions it is thus evident that a large number of empirical evidences are mixed and inconclusive on these issues. This may be due to the differences in the type of data used, choice of country, time periods, selection of independent variables, sources of data selection and applied methodology. Further it was found that there is a lack of research on the effect of FDI inflows on automotive industry in India. As industry specific dynamics vary the impacts of FDI are expected to create varying effects. Therefore it is vital to identify the impact of FDI in this sector. Further a few studies which have been conducted in this field do not explain the impact of FDI on R&D activities of automotive industry. Also the impact of FDI inflows on imports and exports of this sector (automotive) has not been explored in recent years. It is in the above context that the present study has been undertaken to fill these gaps. Accordingly the chief objectives of the study are:

1. To analyse the sources of FDI in India,
2. To over view the policy changes which have evolved over a period of time,
3. To find the relation between FDI and economic growth in general, FDI in automotive sector and economic growth in particular,
4. To examine the trade intensity of FDI on Indian economy in general and automotive sector in particular, and to analyse the impact of FDI on R&D and productivity in general and of automotive sector in particular.

The literature surveyed above has also highlighted the policy formulated as an important conduit for larger FDI inflows. It is this aspect that has been dealt with in the next chapter.