

# Importance of FDI Flow into Research and Development Sector in India

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**Abstract**—*In the present context of large scale technological development taking place around the world every country should necessarily possess highly innovative and competitive products and processes with respect to cost, quality and sophistication and internationally integrated advanced production processes. So it going to be a calculated and judicious choice between working hard and relentlessly for developing advanced ,world class indigenous technological capabilities which are capable of restricting the entry of FDI (generally, or into specific activities) and opting for FDI in appropriate situations. The research paper is taken up to the study and analysis of the important sector of Research and Development in the light of the various considerations mentioned above. The paper also aims at throwing light upon the various favorable and also adverse conditions etc for FDI and also for developing and possessing a strong indigenous technology base.*

**Keywords:** *FDI, research and development, IITs, NITS, schools, education*

## 1. INTRODUCTION

The abundant and world-wide growth of FDI in the recent past has made the developed and developing nations like Brazil, Chile, China Uruguay, India, Russia, U.S and host of other such countries to adopt it as a safe, necessary and integral part of the development strategy. Majority of experts feel it acts as a major catalyst in the development of a country through up-gradation of technology, managerial skills and capabilities in various sectors. It cannot be denied that in many situations in addition to the direct capital financing it supplies, FDI can be a source of valuable technology and know-how while fostering linkages with local firms, which can help jumpstart an economy. But it is always advocated/important to take a cautious, strategic and calculated approach for adopting FDI in each situation depending on various factors like state of economic and technical development in various sectors presently existing in the host country, expected employment losses/gains, possibility of promotion of unhealthy competition among domestic players resulting in exit of small players from the market and distortion of urban cultural development and host of other factors. Moreover it is always going to be a calculated and judicious mixture of working hard and relentlessly for developing advanced world class

indigenous technological capabilities which are capable of restricting the entry of FDI (generally, or into specific activities) and going for FDI in appropriate situations. We have taken up the analysis of the important sector of Research and Development in the light of the various considerations mentioned above.

## 2. OBJECTIVE OF THE STUDY

The objective of our study is to analyze in general the current scenario in few of the various sectors like Manufacturing, Research and Development, Retail, Auto industry, Pharmacy and biotechnology, Machinery and equipment, Services, Chemicals, Metals and minerals ,Electronic components ,Warehousing and storage etc in India in the light of past experience and what we conceive as current pressing requirements in order to chalk out the various Opportunities, challenges and threats, various pitfalls, appropriate strategies to be followed etc of adopting FDI and also for developing and possessing a strong indigenous technology base in the present Indian scenario. We have taken the example of adopting FDI in a very important sector like Research and Development in detail to illustrate the above points.

The paper is based on analytical logic developed on the basis detailed literature survey, statistical data, case studies and reports available in newspapers and online data bases etc.

## 3. WHAT CAN BE THE GENERAL GUIDELINES TO ASSESS POTENTIAL BENEFITS AND DRAWBACKS /DANGERS BEFORE CHOOSING ANY PROJECT WITH FDI?

FDI contributes to development of any country through improvement of technology, managerial skills and capabilities in various sectors usually called the “favorable spillover effects”. The usual likely channels of FDI spillovers are through a variety of activities in the host economy including labor and management training, technological “copying”, direct licensing of technology, vertical linkages in production and distribution value chains etc. As a first and foremost point to keep in mind is that there is need for more consideration/

detailed study and analysis of the different circumstances, situations that obstruct or promote benefits, favorable spillovers/developments etc for each situation. For example not all sectors have the same potential to absorb foreign technology or to create linkages with the rest of the economy. The following study and also analysis based on reports, data of various authors mostly highlight this aspect. On the basis of an analysis using cross-country data for the period 1981-1999 Laura Alfaro<sup>1</sup> broadly concludes:

1) Benefits of FDI vary greatly across sectors 2) FDI inflows into primary sector, tend to have a negative effect on growth, while investment in manufacturing a positive one. Evidence from the service sector is ambiguous. Often-mentioned benefits, such as transfers of technology and management know-how, introduction of new processes, and employee training tend to relate to the manufacturing sector rather than in sectors the agriculture or mining sectors

The next most important potential factor for getting the maximum spill-over benefits or even for attracting greater FDI in flows is the host country's level of human capital with respect to quality and quantity. Host country should have high levels of human capital to start with to attract large amounts of technology intensive foreign MNCs that contribute significantly to the further development of labor skills. At the same time, economies with weaker initial conditions are likely to experience smaller inflows of FDI, and those foreign firms that enter are likely to use simpler technologies that contribute only marginally to local learning and skill development or create a potential for spillovers of knowledge.<sup>2</sup> So top priority should be given to human capital development which is an important requirement for not only for growth and development but also for attracting FDI especially from advanced countries.

The frequent breakdown or deteriorating rule of law and political instability, as well as institutional challenges are some of the discouraging factors against FDI and trade flows. Also problems related to corruption, inadequate infrastructure and inconsistent regulations have considerable effect on the country's future prospects of attracting more efficiency-seeking FDI. Country's openness, the governmental rules relating to the repatriation of assets earnings, the decision on the rights to send back dividends and assets also are the most vital factors in attracting considerable foreign flow of equity.

#### **4. ARE THERE ANY SECTORS WHERE FDI CAN CAUSE POTENTIAL GRAVE DANGERS?**

Foreign investments should have linkages with the rest of the economy and absence of such linkages could have limited effect in effecting growth in any economy. Tracing back the history of FDI inflows to different countries of the World at different times reveals some basic lessons regarding FDI. For example as already mentioned agriculture or mining sectors have little or almost no potential for favorable spillovers. From 1880 and until the first decades of the twentieth century,

for example, FDI grew exponentially and became heavily concentrated in the exploitation of natural resources. World War I and the nationalization of foreign property in Russia in 1917 dealt heavy blows to FDI. At the worst cases 'enclave' or exploitation type of development occurred involving primary products from mines, wells, and plantations slip out of a country without leaving much of a trace in the rest of the economy. These facts also emphasizes that differences potential linkages effects exist in sectors, linkages are weak in agriculture and wells, plantations and mining After decades of skepticism, in the 1980s international events reshaped the attitude towards FDI mainly due to two important factors 1) there was a shift in the industries in which foreign firms were active compared to the post war period, which involved mostly the exploitation of oil and natural resources, towards manufacturing, services, and high technology 2) the debt crisis hampered the access of developing countries to credit and portfolio investment. Pursuing targeted policies towards attracting foreign direct investment also became the norm in many countries<sup>1,7</sup>.

#### **5. HOW TO RAISE OUR LEVEL OF RESEARCH AND DEVELOPMENT (R&D) IN TERMS OF QUALITY AND PERFORMANCE BY BUILDING A VIBRANT, INNOVATIVE AND STRONG HUMAN CAPITAL?**

Advanced indigenous technological capabilities are capable of restricting the entry of FDI (generally, or into specific activities). The possession of a strong indigenous technology base is vital not just for building the competitiveness of local enterprises – it is also important for attracting high-technology FDI and for R&D investments through FDI or other means. But at the same time a cautious and balanced approach in making a choice of allowing MNCs or otherwise is the key for avoiding danger of technological deficiencies/gaps especially in complex and sophisticated activities and the danger is much greater now than, say, several decades ago. So is the risk of being unable to enter export markets for activities with highly competitive products with respect to cost, quality and sophistication and internationally integrated advanced production processes. It will be appropriate to examine some statistics regarding the extent of FDI flow into different sectors in the past in India.

N. Mrinalini\*, Pradosh Nath and G. D. Sandhya<sup>3</sup> making an overview of FDI in R&D in India during 2003–2009 arrive at some important observations -1) share of R&D in total FDI inflow was only 8.25% 2) Almost 86% of the investments is less than 50 million USD clearly indicating absence of high-end R&D .3) The software and IT sector which is human resource-intensive attracted most of the FDI in R&D, auto industry being a poor second, closely followed by pharma and biotechnology sector. The rest of the sectors had insignificant FDI in R&D. 4) Out of 706 companies investing in India, only 74 companies have been granted patents. These 74 companies together have 214,686 global patents granted and only 1166 of

those patents granted are from India. The software and IT sector shares 749 of the 1166 patents from India, the patent information, again indicating that the R&D activities undertaken by MNCs in India, in comparison to their global R&D activities do not reflect much importance of their Indian set-up, or their interest in high-end R&D initiatives.

These statistics are indeed discouraging and disappointing as it indicates that though India is doing reasonably well in IT sector in other sectors it is lagging well behind. India should consciously work towards attracting greater FDI into high-end R&D in other important sectors like Aerospace, Auto industry, Pharma and biotechnology, Machinery and equipment, Chemicals, Metals and minerals, Electronics and Tele communication etc as a means of strengthening the country's technological prowess and competitiveness at world levels. How and what can trigger India to a well-balanced and sustained growth as mentioned above over coming bottlenecks and road blocks? Following are some of the important issues factors, lines of thinking, needing immediate attention.

## 6. REVIEWING REFORMING MODERNIZING UP GRADING OUR EDUCATION SYSTEM

There can be no two opinions about the fact that Education plays a vital and major part and serving as a major cog in building up a vibrant and strong human capital. Availability of knowledgeable well-trained young science and engineering talent pool fluent in English language is the most basic requirement for doing R&D. or to get involved in innovative product and process development of world class level. Let us examine the merits and demerits of the education system being followed in India at all levels.

According to a new global report, India has slipped in innovation by 10 places to 76th position in the world this year even as countries like Brazil has risen by three places to 61st rank, Russia by 13 places to 49th, China by six places to 29th, while South Africa by five places to 53rd rank.. According to the Global Innovation Index (GII) 2014 report, .India is the only country, which has fallen among the BRICS economies, 143 countries were examined/scanned using 81 indicators to gauge their innovation capabilities and measurable results. The index has become a benchmarking tool for business leaders, policy makers and observers alike over the last few years. Confederation of Indian Industry was a knowledge partner in the 2014 study. Switzerland topped the innovation index followed by the UK and Sweden. The US ranks sixth, while Hong Kong is 10th. Mauritius, Seychelles and South Africa came at 40th, 51st and 53rd. Performance in innovation features like information and communication technologies, business sophistication and innovation outputs such as creative goods and services and online creativity were mainly focused for this assessment<sup>4</sup>.

This matter should cause a great concern for a country like India with unique capital called the demographic quotient — that places it to be the youngest country in the world. A

**serious and relevant question often asked -Why is India still considered a developing country and not a developed country? Does the prevailing India's education system is a major contributor/culprit for this? Many see India's education system as a stumbling block towards its objectives of achieving inclusive growth.** Majority of us and also the government are not realizing or thinking strongly or paying enough attention right now about how education plays a vital and major part and serving as a major cog in building up vibrant and strong human capital.

So first and foremost we including our politicians, experts from public and private sector companies should contribute their might and time frequently analyzing/assessing/reforming /improving our education system so that it is world class in all respects. In this respect we can frequently study and learn from advanced countries regarding all parts of education system like teaching methods, books prescribed at different stages, minimum decent infrastructure required, improving coordination /inputs /participation among politicians industry, research organizations etc. Concepts like what is Industrial R&D and factors involved in commercialization of any basic concepts etc should be touched upon to ensure all round development even from early stages of our Education system.

The basic minimal thrust of government education spending today must surely be to ensure that all children have access to government schools and to raise the quality and standards of education in those schools and eradicating the inadequacies like low quality, weak/poor/or almost no infrastructure, inadequate pedagogic attention indifferent teachers with low motivation (part of the blame might be due to. Government schools are unable to attract good quality teachers due to inadequate teaching facilities and low salaries). We should put forth our best efforts to avoid building the wide gap between people who can afford quality education and who can only get an education with almost no value. People belonging to rural areas are the worst sufferers in this respect.

Added to the above anomalies is another factor which we have to face squirrely on the face- namely the mode of selection adopted for admission into our top educational institutes like IITs, NITS etc. Most will readily agree that without the aid of mushrooming costly coaching centers one cannot dream of cracking the hard nut of admission tests adopted by these institutions. Here also a wide divide is created between those upper middle classes and above who can afford these private tuitions given in coaching classes and poor who can afford only public education. Further there is a big disconnect between the syllabus generally learnt in school curriculum and which is adopted for IIT entrance tests. This in turn results in students carrying the big burden and torture of compulsorily attending both school and coaching classes having no time for sports, personality development activities etc, which are very important at that age. Can we not think of some ways of distributing the additional burden of what standards IITs demand into school curriculum? It is high time we see that at

least in mathematics and science subjects the whole country follows the same standard syllabus (imbibed with basics, facts, figures concepts etc of high standards matching the expectations IITs and NITs), books, examination schedules etc to start with. This step can overcome lot of problems mentioned above

## **7. REVIEWING REFORMING MODERNIZING UP GRADING OUR EXAMINATION SYSTEM**

Another important issue to reassess is the way we examine and assess our students in both schools and entrance tests. Authors of a recent report on this subject mainly raises the following questions – They strongly feel to-days examinations mainly test the ability of students power of "Memorization of facts and formulae "without giving importance to their ability to mastering of concepts, developing independent and creative and integrative thinking that connects understanding of different subjects, and ability to apply that understanding to solve *practical problems* of society? Moreover Science curricula at the undergraduate level tend to be highly theoretical and very dense in content. This poses two problems. Theory is prioritized over application and time constraints do not allow teachers to explore all concepts, in depth. As a consequence, students are frequently exposed to many concepts but fail to understand them in depth and explore their application. This structure results in 'teach more and learn less', when ideally it should be the other way around<sup>5</sup>. In short the main flaw seems to be facts, figures and statistical type of information or data which one can easily refer to in books, internet etc form the basis of usual examinations and also entrance tests- this basically tests the memory for facts and figures of statistical nature, instead testing the ability to know and adopt basic and advanced concepts which form the basis for one's ability to solve practical problems, commercialize basic concepts or solve practical problems of society.

## **8. SOME STATISTICS ABOUT HOW MUCH AND IN WHAT WAY MONEY IS SPENT ON RESEARCH AND DEVELOPMENT IN INDIA**

More than a quarter of (India's) R&D investment goes towards basic research, against 5 per cent in China and 17 per cent in the United States. India's investment in science has lagged behind that of neighboring China, the US and South Korea, resulting in these countries staying ahead when it comes to research. While India invested 0.88 per cent of its GDP in science research, the US invested 7-8 per cent, and South Korea 3-4 per cent. For instance, out of a total global R&D spends of \$1143 billion, the percentage claimed by the US is 33.6, Europe 24.5, and Japan and China 12.6 each, while India's share is a meager 2.1. In India, Government sources pick up 75-80 per cent of the R&D expenditure, and only 20-25 per cent spent by private sector and a mere three per cent by universities. Whereas the break-up of percentages for OECD countries is 69 by private enterprises, 18 by

universities, 10 by government agencies and three by non-profit bodies. FDI in India's R&D was only \$0.5 billion in each of 2010 and 2011. These facts and figures only go to show that India needs to invest more on R&D not only of the basic type but also other avenues like modernizing processes and products, productivity improvements and innovation in creative goods and services and online creativity etc, by inviting participation from all sections –private and public sectors, universities, Government agencies, non-profit bodies, scientific establishments etc

## **9. HOW TO STIMULATE PRIVATE SECTOR FUNDING IN RESEARCH AND DEVELOPMENT**

Government of India have realized that to emerge top leader at world level in Science, Technology and innovation private sector investments into R&D must undergo significant increases. For stimulation of private sector investment into R&D in India, they feel studying and learning topics and concepts like Comprehensive strategy and implementing mechanism including risk and failure management procedures in any commercially viable projects, knowledge in the entire value chain of industrial R&D like R&D in the laboratory; Pilot production/Test beds/design & development/Standardizations / field trials, etc and development of technology for select sectors of Interest to private sector is necessary apart from the regular ones. The key to research is a qualified Human Resource imbued and trained with all the above traits. It will be imperative to build a large pool of quality professionals suited for industrial R&D and create both high value and a large volume of employment in the private sector for research oriented functions. Our entire curriculum should take ample care to see all the above concepts are incorporated at appropriate stages.

## **10. SUMMARY AND CONCLUSIONS**

FDI has been recognized in general as a safe, necessary and integral part of the development strategy and many countries of the world have adopted the same in different situations. But it is important to work hard for the possession of a strong indigenous technology base as it is vital not only for building the competitiveness of local enterprises – it is also important for attracting high-technology FDI and for R&D investments through FDI or other means.

Advanced indigenous technological capabilities are capable of restricting the entry of FDI (generally, or into specific activities). It is always difficult choice to make between the above two strategies and it requires thorough and careful studying/weighing each situation. All should recognize that constant Reviewing, reforming, modernizing, up- grading our education, Examination and training systems thus building up a vibrant and strong human capital is the main and vital Key for building advanced indigenous technological base and capabilities and vigorous participation of politicians, Private and public sector in this mission is very essential.

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