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Trend Analysis of Technology Sector FDI in India from Top Five Investing Countries

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ABSTRACT

This paper has attempted to analyse the patterns of FDI in the technology sector from the top five investing countries in India. In recent years, India's information technology industry has drawn a considerable amount of foreign direct investment. Investments are being made in four main sectors of the Indian information technology industry: online firms, IT services, IT services, and software merchandise. It is well known that FDI will complement local development activities in many ways, including improving export competitiveness; creating employment and reinforcing the skills base; enhancing technological capabilities; and rising financial capital development. In India, FDI has allowed a certain degree of financial stability to be achieved; development and growth to sustain and succeed in the global economy. Efforts made by the Indian government are also studied to attract FDI in the science and technology sector. According to official statistics, foreign direct investment (FDI) in India grew by 13 percent to a record of $49.97 billion in the financial years 2019-20. With investments of $14.67 billion, Singapore emerged as India's largest source of FDI during the last fiscal year. Mauritius ($8.24 billion), the Netherlands ($6.5 billion), the United States ($4.22 billion), the Caiman Islands ($3.7 billion), Japan ($3.22 billion), and France ($1.89 billion) followed. FDI in the IT sector accounted for 10% of total FDI in India during 2000-2019.

KEY WORDS: TECHNOLOGY SECTOR, FOREIGN DIRECT INVESTMENT, ECONOMIC GROWTH, INVESTING COUNTRIES, TREND ANALYSIS.

INTRODUCTION

India is the largest democracy in the world and is the fifth largest purchasing power parity economy in the world. India provides huge investment opportunities with its ample labor supply, unexplored markets, and adequate natural resources. This is the fastest-growing trillion-dollar economy in the world and has been the fifth largest economy in 2019 to surpass the UK and France, with a nominal GDP of $2.94 trillion. The nation ranks third when contrasting GDP to $11.33 trillion in terms of purchasing power parity. According to the IMF, India's growth rate is projected to rise from 7.3 percent in 2018 to 7.5 percent in 2019 as the currency exchange policy drags and the implementation of goods and services tax fade.

Since India is a developing country, capital is small, and socio-economic issues such as health, poverty, research and development, obsolescence of technology, education, global competition are many. The role of FDI in the host country's overall development is multidimensional. It helps to bring about the creation of foreign capital resources without debt, capacity enhancement, new jobs, spillovers, and allocative performance effects. FDI also promotes foreign exchange, information, expertise

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and technology transfer. The Government of India has therefore approved 100% FDI under the automatic approval route in the electronic hardware sector and the software development sector. In filling the gap between domestic saving and spending overall capital growth, FDI plays a major role, (Bhave, 2020).

The flagship 'Make in India' campaign of the Union government, launched in 2014, is led by the ideals of competitive federalism. It aims to leverage the capacity of the human, financial, physical, social and natural capital base of India and is focused on the premise that the economy can reap the benefits of FDI inflows by transforming India into a global manufacturing hub, (Saha & Bhowmick, 2020). Through defining the "rules of the game," public policy plays an important role in encouraging innovation. These include the rule of law, intellectual rights, patent protections, contracts, free trade policies, freedom to travel, numerous investment incentives, and light-touch regulations and regulatory regimes, (Nguyen, et.al. 2020). In this paper, an attempt has been made to study FDI inflows in the information technology sector and from the top five investing countries in India.

Review of Literature: Deivamani et al. (2018) have analysed the determinants of FDI, sources of FDI inflows in India during the financial year 2016-17. As per the study, the service sector and construction and development sector inflow of FDI attained sustainable economic growth and development through the creation of jobs in India. So to make the Indian economy a developed economy, the Government must proceed to elicit FDI inflows in India.. Murugesan (2016) have investigated the trend and growth of FDI inflows in the past liberalization period and the sector-wise FDI inflows received in India. This study has examined a significant effect of FDI on the economic growth and sector-wise FDI inflows received in India from 2006 to 2013. FDI inflows can be utilized as a means of improving domestic production, exports and saving through the equitable distribution FDI inflows can be used to raise the output, Productivity and trade at a sectoral level of the Indian economy.

Earlier Graeme (2015) had examined the determinants of FDI using a large sample of both developed and developing countries. The study finds that variables like size and scale of economic activity in the host country are the most significant variables in explaining FDI flows, while variables such as economic freedom, tax incentives and human capital are not at all significant. Roy (2012) studied the causal relationship between foreign direct investment (FDI) and economic growth for selected Asian economies covering the period from 1981-2008. It has been observed that for countries like China, India, Pakistan, Sri Lanka, Indonesia, Philippines and Singapore, the direction of causality runs from economic growth to FDI and not the other way round. However, for Malaysia, there is no causality between FDI and GDP. Only in the case of Thailand, a bidirectional causal relationship exists. Malaysia confirmed Granger neutrality whereas for Thailand bi-directional relationship exists. Countries such as China and India can compete for higher growth potentials.

Objectives: To analyse the trends of FDI inflow from top five investing countries and to Study inflow in the technology sector from these countries.

Research Methodology: Trend analysis Regression has been applied by using the model as:

$$\text{Log FDI}=c+\beta\,(t)+u$$

b) Exponential Growth rate is studied.

$$Y= abt$$

Table 1. Trend Analysis of Foreign Direct Investment Inflow in IT Sector from January 2000 to December 2018

Year	IT Sector	Total FDI	% Share of Total Inflows	% Growth as Per Preceding Year
2000	12008.32	104411	11.5	
2001	20566.93	160711	12.8	71.27
2002	31908.64	161345	19.8	55.15
2003	13550.09	95640	14.2	-57.53
2004	31,030.11	147814	21.0	129.00
2005	42,066.76	192707	21.8	35.57
2006	87,492.90	503573	17.4	107.99
2007	102,148.54	654950	15.6	16.75
2008	78,102.50	1595295	4.9	-23.54
2009	32,124.70	1309799	2.5	-58.87
2010	45,347.95	960150	4.7	41.16
2011	31,350.97	1599349	2.0	-30.87
2012	34,374.34	1215914	2.8	9.64
2013	36,598.31	1294825	2.8	6.47
2014	95,622.02	1753134	5.5	161.27
2015	42,537.03	2525614	16.8	344.85
2016	16,196.91	3116439.70	5.20	-
2017	45,701.84	2827679.50	16.05	
2018	41,733.18	2906952.30	14.13	-
Total	840462.04	23126303		
ECGR	9.42			
Constant		38620.13		
Reg. coefficient		0.033		
R-square		0.0942		
F-value		1.769		
P-value		.020		

Source: Various newsletters from 2000 to December 2018

Data Analysis: FDI IN INFORMATION TECHNOLOGY SECTOR In India's economy, the information technology (IT) sector has grown as a big success story. In the last decade, the Government of India's liberalised policy reforms has pushed the Indian IT industry on to a road of growth and prosperity. In today's economies of the world, electronics and information technology are proving to be the growth driver. A comparatively new entrant in India's export horizon, the Electronics Hardware and Computer Software Services industry has emerged as a leader among all industries and has been trading consistently on a fast growth path in recent years. The industry's wise break-up of cumulative FDI inflow shows that after construction growth, computer software and hardware were placed third. Trend analysis reveals that gross total inflow grew at an annual exponential compound growth rate of 11.8 percent from Rs. 31,030.11 million in a year, 2004 to Rs. 41,733.18 million in the year, 2018. Its share of total FDI inflow decreased from 21 percent in 2004 to 2 percent in 2011. Thereafter, FDI gradually increased in this sector to Rs. 41,733.18 million (14.18 percent in 2004).

Table 2. Regions Wise FDI Inflows in Computer Software and Hardware from January 2000 to December 2019

S.No.	Regions	Amount	% age Share of FDI
1.	Bangalore	10,395.95	25.18
2.	New Delhi	9553.49	23.14
3.	Mumbai	9,208.78	22.30
4.	Chennai	2,071.92	5.02
5.	Hyderabad	1755.10	4.25
Total	32,985	79.89	

Source: SIA Annual Newsletter Issue 2019

Table 3: Country-Wise Equity FDI Inflows in Computer Software and Hardware from January 2000 to December 2019

S.No.	Countries	Amount of FDI	%age Share of FDI
1.	Mauritius	12,839.73	29.44
2.	Singapore	11,390.26	26.12
3.	U.S.A	5,622.22	12.89
4.	Netherlands	4,240.01	9.72
5.	Cayman Islands	2148.08	4.93
Total	36,240.30	83.10	

Source: SIA Annual Newsletter Issue 2019

Region-Wise FDI in Computer Software and Hardware Sector: Table 2 displays the area-wise break-up of FDI inflows from January 2000 to December 2019. With 80% FDI, Mumbai, New Delhi, Bangalore, Chennai and Hyderabad are the major FDI inflow centers in the IT market. In computer software and hardware, Bangalore led with 25.18 percent of total FDI inflows.

Country Wise FDI in the Information Technology Sector: Thus from January 2000 to December 2019, the country-wise break-up of total FDI inflows in the IT sector was given in Table 3. Mauritius, the United States, Singapore, the Netherlands and the Cayman Island together accounted for around 83.10 percent of FDI inflows in this sector. With 29.44 percent, Mauritius ranked at the top.

Table 4. Trend Analysis of Foreign Direct Investment from Mauritius from January 2008 to December 2018

Year	FDI from Mauritius	Total FDI Inflows	Growth of % Inflow	% Share of Out of Total
2008	598586.46	1595295.00	-	37.52
2009	560128.88	1309799.00	-6.42	42.76
2010	329399.98	960150.00	-41.19	34.31
2011	437791.67	1599349.00	32.91	27.37
2012	491418.84	1215914.00	12.25	40.42
2013	331290.51	1294825.00	-32.58	25.59
2014	429456.74	1753134.00	29.63	24.50
2015	590308.74	2525614.00	37.45	23.37
2016	1012330.1	3116439.70	71.49	32.48
2017	1053377.4	2827679.50	4.150	37.25
2018	593461.6	2906952.30	-43.700	20.415
Total	5834089.32	21105152		
ECGR	28.5			
Trends				
Constant value		366001.01		
Reg. coefficient		0.173		
R-square		0.285		
F-value		42.67		
P-value		.000		

Source: Various newsletters from 2000 to December 2018

Fdi From Mauritius: The Double Taxation Avoidance Agreement (DTAA) was signed by the Indian government and Mauritius in 1982. As a consequence, the maximum FDI comes to India via Mauritius. A distinctive feature of the double tax avoidance treaty concluded in August 1982 in Mauritius provides some indication as to why Mauritius remains India's chosen route for investment. The treaty stated that capital gains made on the sale of shares of Indian companies by investors in Mauritius would only be taxed in Mauritius and not in India. However, the treaty survived for the first 10 years only on paper, as foreign institutional investors were only allowed to invest in Indian stock markets. This changed in 1992 when foreign institutional investors (FIIs) were also allowed to enter India. Mauritius immediately took advantage of this move. Under the Business Activities

Act, multinational companies have been authorised to register for foreign investment in the island country.

The FDI inflow from Mauritius, however, remained important even though its share of FDI inflows declined, remaining one of India's largest sources of FDI. Based on the time factor with F value 42.67, the value of R square explains the 28.5 percent difference in FDI inflow, which is important at a 1 percent significance level. It shows a large fluctuation in Mauritius' FDI inflow. To summarize, in India, FDI inflows from Mauritius still dominate. It was limited to a few sectors of the Indian economy and was concentrated in the country's economic and industrial growth regions.

Table 5. Trend Analysis of Foreign Direct Investment from Singapore from January 2008 to December 2018

Year	FDI from Singapore	Total FDI Inflows	Growth as Per Preceding	% Share of Total
2008	157,758.64	1595295.00	170.57	9.89
2009	148,262.44	1309799.00	-6.02	11.32
2010	96,757.80	960150.00	-34.74	10.08
2011	195,969.66	1599349.00	102.54	12.25
2012	152,421.76	1215914.00	-22.22	12.54
2013	222,116.31	1294825.00	45.72	17.15
2014	432,861.05	1753134.00	94.88	24.69
2015	862,990.95	2525614.00	99.37	34.17
2016	659,735.80	3116439.70	-23.55	21.17
2017	701,090.10	2827679.50	6.27	24.79
2018	1,086,273.00	2906952.30	54.94	37.37
Total	4,716,237.51	21105152		
ECGR	22.7			
Constant value		78975.45		
Reg. coefficient		0.227		
R-square	.785			
F-value	29.29			
P-value	.000			
Source: Various newsletters from 2000 to December 2018				

Fdi From Singapore: Singapore was put second after Mauritius in the country-wise break-up of cumulative FDI inflow. The Singapore FDI inflow was given in Table 3 shows an annual exponential compound growth rate of 22.7 percent from 157,758.64 million in December 2008 to 1,086,273 million in December 2018, its gross cumulative inflows rose. The flow of FDI from Singapore moved at a slow rate until 2012, accounting for a small proportion of total inflows. However, there has been a spurt in the flow of FDI from this country since signing the comprehensive economic agreement with Singapore. In the following years, the FDI flow from Singapore registered enormous growth, with a slight exception in those years. In recent years, Singapore has taken the top spot for FDI flow by relegating Mauritius to the second position, total FDI inflows in 2018 have increased to 37.37 percent.

To sum up, Singapore has become India's most significant investor in FDI flows. At a 1 percent level of significance, the value of R-square is 78.5 significant. Because of the time factor, which is an independent variable, it shows a 78.5 percent variation. The F value is also significant at the 1 percent significance level. During the study era, it suggests a large fluctuation in its flow.

Fdi From Japan: Japanese FDI has been predominantly in the aerospace, electrical equipment, telecommunications, chemical, and pharmaceutical industries in India. The presence of Japanese firms in India has been gradually growing. There were 1,229 Japanese companies registered in India as of October 2015, an increase of 6 percent compared to 2014. As of February 2016, there were also a total of 4,417 Japanese business establishments operating in India, an increase of 14 percent compared to the previous year.6In the next five years, the governments of India and Japan signed an agreement to double Japanese investment in Indian companies and improve two-way trade. The plan was categorised into five broad areas: the creation of selected townships in India, promotion of investment and development of infrastructure, further development and cooperation in IT, enhancement of cooperation in strategic sectors, and economic integration in the Asia-Pacific region.

Table 6. Trend Analysis of Foreign Direct Investment from Japan from January 2008 to December 2018

Year	FDI from Japan	Total FDI	%Growth Per Preceding Year	% Share of out of Total
2008	16,976.32	1595295.00	-38.83	1.06
2009	60,943.17	1309799.00	258.99	4.65
2010	58,578.58	960150.00	-3.88	6.10
2011	143,486.13	1599349.00	144.95	8.97
2012	103,644.23	1215914.00	-27.77	8.52
2013	82,344.24	1294825.00	-20.55	6.36
2014	142,683.79	1753134.00	73.28	8.14
2015	110,843.79	2525614.00	-22.32	4.39
2016	388,098.00	311,643,9.7	250.13	12.45
2017	113,515.50	282,767,9.5	-70.75	4.01
2018	174,715.90	290,695,2.3	53.91	6.01
Total	1,395,829.65	21105152		
ECGR	20			
Constant value		31225.58		
Reg. coefficient		.200		
R-square		.569		
F-value		10.59		
P-value		.011		
Source: various newsletters from 2008 to December 2018				

The country-wise FDI inflow analysis shows that Japan is India's fourth-largest investor. The share of Japanese

FDI inflows ranged from 4.01% to 12.45% of India's total FDI inflows. Nevertheless, its share of total FDI in India has shown a growing trend since 2009. The R2 value indicates that due to changes in time factor and F value, is 56.91, which is significant at 1 percent significance level.

Fdi From Netherland: In July 1988, the Indian government signed with the Netherlands the Avoidance of Double Taxation Prevention Fiscal Evasion Deal. Furthermore, as of May 2012, the Convention between India and the Netherlands on the Prevention of Double Taxation and the Prevention of Fiscal Evasion was amended.7 The Bilateral Investment Promotion and Security Agreement between the Republic of India and the Kingdom of the Netherlands for the Promotion and Protection of Investments was signed on 6 November 1995 and entered into force on 1 December 1995.

Table 7. Trend Analysis of Foreign Direct Investment from the Netherlands from January 2008 to December 2018

Year	FDI from Nether-Land	Total FDI Inflows	%Growth over the Preceding Year	% Share out of Total
2008	42,813.50	1595295.00	53.48	2.68
2009	40,056.60	1309799.00	-6.44	3.06
2010	52,061.05	960150.00	29.97	5.42
2011	58,889.06	1599349.00	13.12	3.68
2012	89,526.74	1215914.00	52.03	7.36
2013	125,318.06	1294825.00	39.98	9.68
2014	198,192.65	1753134.00	58.15	11.31
2015	192,548.62	2525614.00	-2.85	7.62
2016	200,993.80	3116439.70	4.39	6.45
2017	212,468.51	2827679.50	5.71	7.51
2018	232,330.90	2906952.30	9.35	7.99
Total	2,425,737.18	21105152		
ECGR	21.9			
Constant value		29732.41		
Reg. coefficient		0.219		
R-square		.929		
F-value		105.30		
P-value		.000		

Source: Various newsletters from 2008 to December 2018

During the study period, its share of total FDI flow ranged from 11.31 percent to 2.68 percent. The research observed the highest proportion of flows in 2014. But it declined after 2010 and began to grow again from 2012 to 2014. Its share of total FDI initially showed a declining trend until 2008. However, its share of total FDI has increased thereafter and it has risen from 2.68 percent in 2008 to 7.99 percent in 2018. The R square value indicates that a 92.9 percent shift in FDI inflow has been an account of being an independent time factor variable and the F value is significant at a 1 percent significance level.

Fdi From USA: The Agreement between the Government of the United States of America and the Government of the Republic of India on the prevention of double taxation and the prevention of tax evasion concerning income taxes, which entered into force on 18 December 1990, was concluded after the two Contracting States had told each other that the procedures laid down in their bribery laws had been completed. In 2008, the United States and India held two fruitful rounds of exploratory talks on a treaty that would include binding legal provisions on the treatment of one nation and the investment of another country. A press release by the Indian Ministry of Commerce and Industry dated September 21, 2011, indicated that the negotiation of a BIT with the US was almost complete.

Table 8. Trend Analysis of Foreign Direct Investment from the USA from January 2008 and December 2018

Year	FDI from USA	Total FDI Inflows	%Growth as Per Preceding Year	% Share out of Total
2008	75,419.79	1595295.00	107.29	4.73
2009	98,730.55	1309799.00	30.91	7.54
2010	64,824.03	960150.00	-34.34	6.75
2011	47,127.75	1599349.00	-27.30	2.95
2012	33,832.89	1215914.00	-28.21	2.78
2013	44,781.75	1294825.00	32.36	3.46
2014	101,476.12	1753134.00	126.60	5.79
2015	252,420.00	2525614.00	148.75	9.99
2016	176,027.50	3116439.00	-30.26	5.65
2017	141,886.10	2827679.50	-19.40	5.02
2018	189,911.00	2906952.30	33.85	6.53
Total	1,036,526.48	21105152		
ECGR	11.5			
Constant value		45460.21		
Reg. coefficient		0.115		
R-square		0.2977		
F-value		3.38		
P-value		0.103		

Source: Various Newsletters from 2008 to December 2018

The flow of FDI from the USA was given in Table 6 from 2008 to 2018. FDI from the USA has fluctuated widely throughout this period. The flow of FDI from the USA has increased at an annual exponential growth rate of 14.79 percent, despite significant variations on a year-by-year basis. Recently, there was a substantial increase in US FDI, with '101476.12 million in 2014 and' 252420 million in 2015, showing a rise of 126.60 percent and 148.75 percent respectively over the previous year. In

2018, it rose by 33.85 percent. Its share of the total flow of FDI ranged from 9.99 percent to 2.78 percent during this period. During this time, its share of total FDI also fluctuated dramatically from year to year. At an exponential 11.5 percent growth rate, the Indian economy is receiving US FDI. The R2 value shows that the disparity in FDI inflow from the USA of 29.77% was due to the time factor change with an F value of 3.38.

CONCLUSION

An analysis of the origin of FDI inflows into India shows that the sources of FDI inflows into India have been broadened by the new policy initiatives introduced. Over 180 countries contributed to FDI inflows in 2019, compared to just 15 in 1991. The percentage shares of FDI inflows from the top five countries underwent a compositional shift in favour of Singapore, Mauritius, and the United States over the period 2008 to 2018, comprising 30.49%, 22.79% and 7.98% of total FDI inflows, respectively. These countries contribute about 60% of India's FDI inflows. In 1990, only six countries, including the United States, the United Kingdom, Germany, Japan, France and the Netherlands, accounted for more than two-thirds of India's overall FDI inflows. The US has played an important role in FDI inflows to India since 1991, accounting for 19.31 percent of total FDI inflows. With the liberalisation of the Indian economy, except the United States, the United Kingdom, Germany, Japan, Italy, and France, which were now not only the key investors, but also during the pre-liberalization period, Mauritius, South Korea, Malaysia, the Cayman Islands, and many other countries appear mainly on the list of major investors.

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