

# Effects of Information Systems and Technology on Foreign Direct Investment in Developing Countries

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**Abstract:** This paper investigates the effects of new information systems and technology on the Foreign Direct Investment in developing countries. It uses the classifications of macroeconomic levels in different developmental countries to determine the effects via employment, GDP, literacy rate etc. of a country. Creation of technology and its acceptance are some of the major processes in the development of a country's economy. Five different developing countries are the main focus of this study i-e: Qatar, India, China, Russia, and Brazil. Data were collected for 1996 – 2016. The results of the study indicate that the factors were greatly influenced as the integration of FDI along with multinationals became popular. The infrastructure and industrial development in the countries boomed. But, lesser people got employment opportunities despite the introduction of new technology. It was found that, in the above mentioned countries, FDI results in improvement in resources such as capital, managerial skills and technology. It improves balance of payment and also provides job opportunities for the locals.

**Key words:** Technology, FDI, China, Russia, multinationals.

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## 1. Introduction

In today's increasingly competitive world, information system and technology is booming and has become an important factor in economic and technological progress in many countries. In the past few years, the technology transfer has been growing rapidly. Foreign direct investment (FDI), as an important way of technology transfer, has attracted the attention of economists. Since the reform and opening up, developing countries have made remarkable achievements in introducing technology and utilization of foreign direct investment [1]. Whereas, developing countries, emerging economies and countries in transition, due to advantages related to FDI, have liberalized their FDI regime and followed best policies to attract investment. It has been recognized that FDI provides lot of benefits to the host country (e.g.) technology spillovers, human capital formation support, enhancement of competitive business environment, contribution to international trade integration and improvement of enterprise development. Moreover, FDI also helps in the improvement of environment and social condition in the host country by relocating 'cleaner' technology and guiding to more socially responsible corporate policies [2]. All of these benefits contribute to higher economic growth, which is the main instrument for alleviating poverty in those economies. However, the accurate economic impact of FDI is difficult to be measured. Benefits of FDI do not increase automatically and equally across countries, sectors and local communities. These benefits vary from one country to another and are difficult to be separated and measured. Where FDI entry has large

(non-marginal) effects, measurement is even more difficult: there is no precise method of specifying counterfactual (i-e: what would have happened if a TNC or TNCs had not made a particular investment or investments?). The assessment of the development effects of FDI generally resorts to one of two approaches. One is the econometric analysis of the relationship between inward FDI and various measures of economic performances. The second is a qualitative analysis of various aspects of TNCs' impacts, without any attempt at calculating a precise relationship or rate of return (UNCTAD, 2006) [3]. The later approach, which will be adopted in the discussion of 'host-country impact' below, includes, in particular, a consideration of the ways in which the unique characteristics of TNCs interact with the unique characteristics of countries (Dunning, 1993) [4]. Foreign Direct Investment is an integral and a pivotal contributor of economic progression as well as growth in developing countries. The results of FDI to a developing country are much more substantial than to a developed country. A developing country is usually short of capital, is razed with poverty, illiteracy along with unemployment rate is usually high. Underdeveloped countries usually do not have access to the modern technology. Hence, rough working conditions and government negligence result in low foreign investments [5]. The impact of these factors coupled with modern day technology has a mixed effect on foreign investments throughout the world. But, the most affected ones are the developing countries. These have been investigated in a number of ways such as in the Journal Of International Management Isabel Alvarez, Raquel Marin [6] came up with the study that "The ability to adapt developed technology in a different place (mechanism more typical of least-developed countries) and their effort to innovate are important factors for competitiveness shifts". Whereas Selma KURTISHI -KASTRATI came up with the idea that "The net benefits from FDI do not grow automatically, and their importance differs according to the host country and condition [7]. The factors that hold back the full benefits of FDI in some developing countries include the level of general education and health, the technological level of host-country enterprises, insufficient openness to trade, weak competition and inadequate regulatory frameworks". Although, until now it is not fully known that, what role does Information Systems and Technology play which affects the Foreign Direct Investment in a developing country?

Information System and Technology is important as it can affect a developing country in a lot of ways. It can change the employment rate, the production method, increase innovation, open new paths for creativity, research and development becomes easier, businesses tend to take more interest in profitable areas (i-e: where costs are lower) [8]. In this paper we investigate the impact of information systems and technology on the changes and fundamental effects on foreign direct investment. Specifically, we addressed the following aims: The increased use of modern day technology in businesses, Easier availability of technology across the world and finally, the dependency of businesses on information technology.

The main focus of this study was to determine the changes and effects of these mentioned factors on foreign investment in the country.

## **2. Methods and Materials**

The study on the impact of information technology on Foreign Direct Investment has been done, previously, in many ways. But, this study focuses on studying about the impact that has affected foreign investments throughout the world. Although we'll mainly focus five countries i-e: Qatar, China, Brazil, Russia and India. All of these are developing countries and have been selected by purposive sampling which is a technique where the sample has been collected via selective methods. This technique is a type of non probability sampling. Furthermore, the impact of FDI on these five countries has been calculated by measuring the change in levels of GDP, employment level, acceptance of technology in a country, acceptance of multinationals in a country, cumulative interest of foreign companies to invest their assets and resources in a developing country. It is understandable that a much of the data is qualitative, which cannot be

measured in mathematical figures. Hence an interest approximate figure has been used based on the recent information available globally on the internet. Graphical figures show the inflow of foreign investments change in GDP of the 5 developing countries chosen, changes in R&D expenditures of these countries, the change in interest level of multinationals since 1996 until 2015. The data have been explored via public websites over the internet and the countries have been selected by purposive sampling technique [9]. All of the variables have been taken via the change that is caused in foreign investments. This is explained by the change in GDP which shows a change in the economy positively. Thus, it can be assumed that the economy is growing, which ultimately attracts foreign investments. The employment levels suggest increment in life style of people which shows that the buyer power has increased substantially. Hence, attracting the foreign investments for the locals of a country may create a higher ratio of potential buyers.

### 3. Results

As it can be seen clearly from the Table 1 provided below that the changes in the economical structure (GDP) of the developing countries has changed much in the past 2 decades by almost 541.5%, The changes have been mostly positive and technology has seen acceptance in almost all developing countries such as Brazil due to its geological closeness to United States of America. Brazil has seen technological growth in airplanes and travel industry. This calls for increment in interests of foreign businesses to invest in such countries. These countries have developed a niche which they pioneer in and have started using it to gain an edge in gaining interest of foreign investors. Results of the study show a huge impact of technological growth on GDP and employment levels of the country.

Table 1. Changes in the Economical Structure (GDP) of the Developing Countries

Years	Qatar	India	Russia	Brazil	China	Average
1996	9.06	399.79	391.72	850.43	860.84	502.368
1997	11.29	423.16	404.93	883.19	958.16	536.146
1998	10.26	428.74	270.95	863.72	1,025.11	519.755
1999	12.39	466.87	195.91	599.39	1,089.23	472.7586
2000	17.76	476.61	259.71	655.42	1,205.00	522.9
2001	17.54	493.95	306.60	559.37	1,332.00	541.8916
2002	19.36	523.97	345.11	507.96	1,462.00	571.6808
2003	23.53	618.36	430.35	558.32	1,065.23	539.1588
2004	31.73	721.59	591.02	669.32	1,942.67	791.2668
2005	44.53	834.22	764.02	891.63	2,269.24	960.7274
2006	60.88	949.10	989.93	1,107.64	2,729.78	1167.466
2007	79.71	1,238.70	1,299.71	1,397.08	3,523.09	1507.658
2008	115.27	1,224.10	1,660.85	1,695.82	4,558.43	1850.894
2009	97.80	1,365.40	1,222.64	1,667.02	5,059.42	1882.456
2010	125.12	1,708.50	1,524.92	2,208.87	6,039.66	2321.414
2011	169.80	1,815.87	2,031.77	2,614.57	7,492.43	2824.888
2012	190.29	1,824.96	2,170.15	2,460.66	8,461.62	3021.536
2013	201.89	1,863.20	2,230.63	2,405.77	9,490.60	3238.418
2014	210.11	2,043.44	2,030.97	2,417.05	10,351.11	3410.336
2015	166.91	2,073.54	1,326.02	1,774.72	10,866.44	3241.526

Further, we see the change in employment levels of the developing countries which indicate a change in the total businesses running in these developing countries. In Table 2 provided below, the employment level of these countries from a range of 1996 to 2015 has been captured with almost a 590% of change indicating a growth in the lifestyle of a country's people which represents its buyers' power and suppliers' power. This has been shown in Fig. 1 given below, which shows the income of the people from 1996 – 2010. SPSS Tool

has been applied to this.

Table 2. Employment Level

Years	Employment	Employment	Employment	Employment	Average Employment
1996	2.58	2.58	40.18	2.43	11.9425
1997	4.87	4.87	44.24	3.58	14.39
1998	2.76	2.76	43.75	2.64	12.9775
1999	3.31	3.31	38.75	2.17	11.885
2000	2.68	2.68	42.1	3.58	12.76
2001	2.85	2.85	47.05	5.13	14.47
2002	3.47	3.47	53.07	5.21	16.305
2003	7.95	7.93	57.9	3.68	19.36
2004	15.4	15.4	68.12	5.43	26.0875
2005	15.51	15.51	104.11	7.27	35.6
2006	37.6	37.6	133.27	20.03	57.125
2007	55.87	55.87	156.25	25.23	73.305
2008	74.78	74.78	171.54	43.41	91.1275
2009	36.58	36.58	131.06	35.58	59.95
2010	43.17	43.17	243.7	27.4	89.36
2011	55.08	55.08	280.07	36.5	106.6825
2012	50.59	50.59	241.21	24	91.5975
2013	69.22	69.22	290.93	28.15	114.38
2014	22.03	22.03	268.1	33.87	86.5075
2015	6.48	6.48	249.86	44.21	76.7575

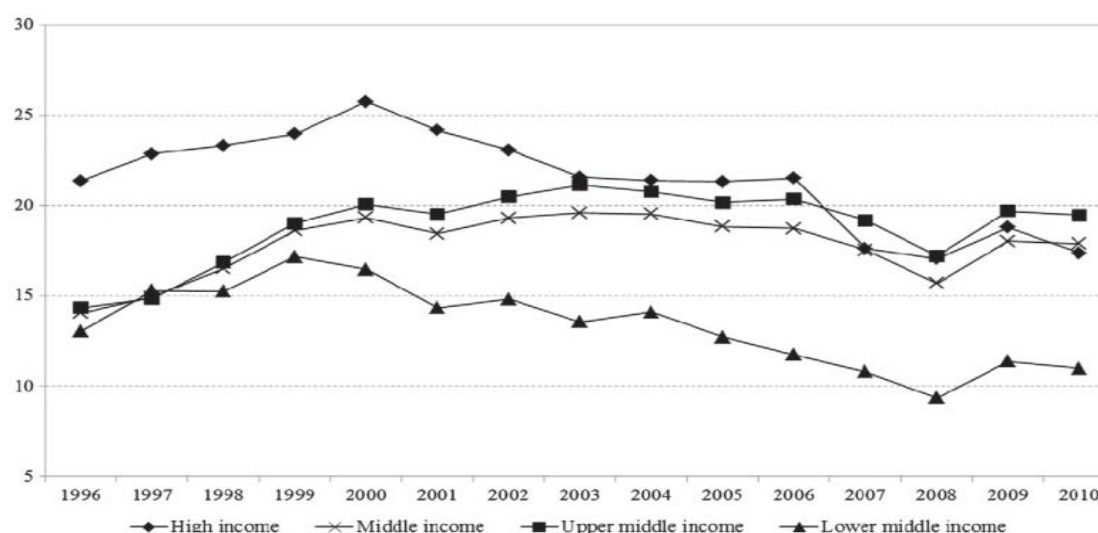


Fig. 1. Income of the people

Source; oecd.org.

Whereas, Table 3 below shows cumulative change in FDI of the countries with almost a 343% change, while Fig. 2 shows percentage change in the FDI of these 5 developing countries. This can also be interpreted as a change in interest levels of multinationals in investing in developing economies. These changes also indicate the increase of technology due to the consistency of increment in both the GDP and employment levels, which are two variables representing a change in FDI of developing countries.

Results of the study explain that the main factors that can cause the inflow of foreign investments are due to a niche of any country that is present in only that country, such as high tourism of Brazil could indicate multinational interest in investing in tourism sector. All countries can be seen with a spurge of growth of almost 541% as an average as an example Brazil has its GDP at 850.5, but in 2015 it grew by almost 108%. This shows that the growth is not only in the countries' economy but also growth in advancements and life styles of the people in these countries, which attracts more people and hence more foreign investments in

the country.

Table 3. Cumulative Change in FDI

Years	Qatar	India	Russia	Brazil	China	Average
1996	3.39	2.43	2.58	11.20	40.18	11.95474
1997	4.18	3.58	4.87	19.65	44.24	15.30246
1998	3.47	2.64	2.76	31.91	43.75	16.9066
1999	1.13	2.17	3.31	28.58	38.75	14.7879
2000	2.52	3.58	2.68	33.00	42.10	16.7736
2001	2.96	5.13	2.85	23.23	47.05	16.24184
2002	6.24	5.21	3.47	16.59	53.07	16.91664
2003	6.25	3.68	7.93	10.12	57.90	17.17684
2004	1.20	5.43	15.40	18.18	68.12	21.6658
2005	2.50	7.27	15.51	15.46	104.11	28.9692
2006	3.50	20.03	37.60	19.38	133.27	42.755
2007	4.70	25.23	55.87	44.58	156.25	57.326
2008	3.78	43.41	74.78	50.72	171.54	68.8438
2009	8.13	35.58	36.58	31.48	131.06	48.5654
2010	4.67	27.40	43.17	88.45	243.70	81.478
2011	9.39	36.50	55.08	101.16	280.07	96.439632
2012	3.96	24.00	50.59	86.61	241.21	81.272758
2013	(8.40)	28.15	69.22	69.18	290.93	89.815432
2014	1.04	33.87	22.03	96.90	268.10	84.3868
2015	1.07	44.21	6.48	75.08	249.86	75.3382

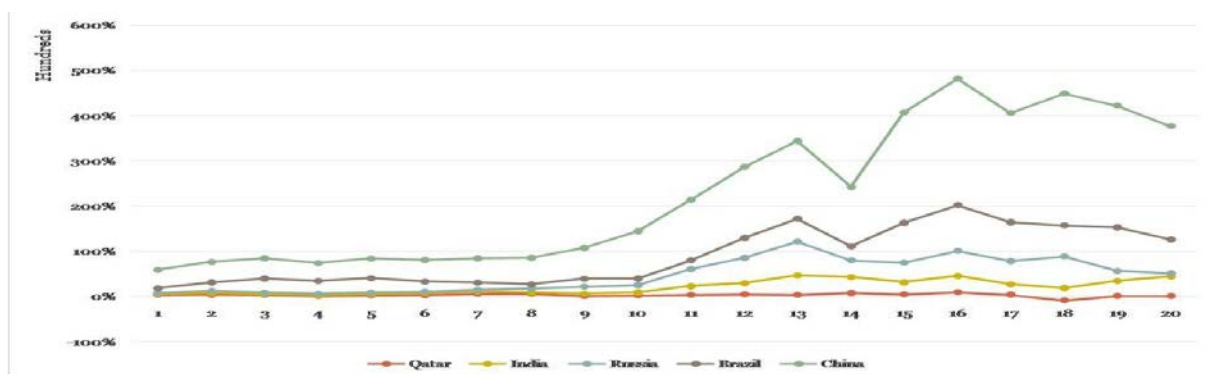


Fig. 2. Percentage change in the cumulative FDI.

Though, R&D of all businesses has been growing substantially which means that businesses are now taking more interest in innovations and development of new products than to salvage profits from existing business ideas. This has been proved by the increment in R&D expenditure from 1996 to 2016. This has been compared with R&D expenditures of China and Russia in Fig. 3[10] given below, which shows a phenomenal change in R&D research of these two countries. There was a downfall in 2008 R&D expenditure due to the global economic recession in Russia.

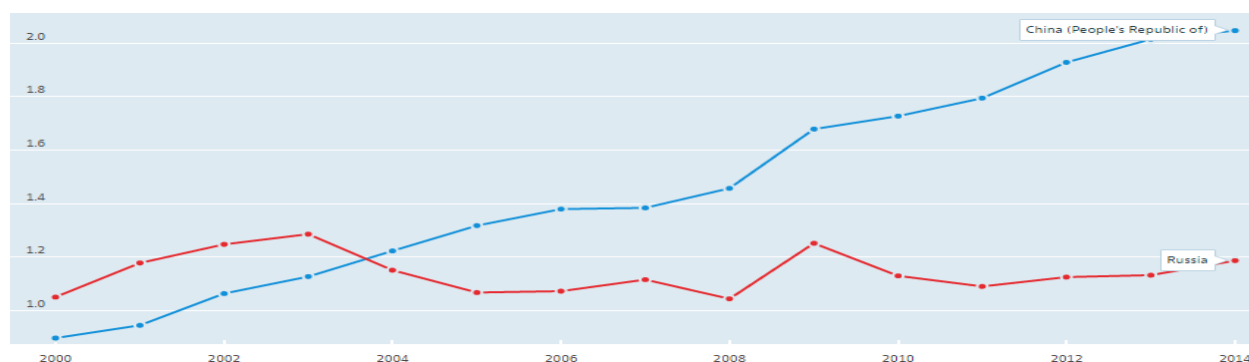


Fig. 3. Change in R&D.

Source; <https://knoema.com/OECDFDIS2014/oecd-foreign-direct-investment-fdi-statistics-2016?country=1000480-russia>

### 3.1. Discussion of Results

Result of this study shows some phenomenal changes in the increment of FDI, which are mainly due to technological factors influencing the GDP of a developing countries economy. As technology progresses, the economy of a country is also seen progressing in similar manner. Although it can be seen from the research work, it is not a direct factor that introduces change in FDI, but 'increment in technology' can also induce a change in a number of factors, which different foreign multinationals and investors can use in order to gain some insight of the host country. The main factors that have been discussed in the result are GDP, R&D expenditures, employment levels and the current FDI inflow in the host country. To discuss the specifics of the study, a massive change in economies of countries has been observed i-e: almost 540% in the GDP, 590% change in the employment levels and a 343% change in the FDI inflows in the developing countries.

### 4. Conclusion

Although this study does not offer a culminated or a definitive answer, but, it does offer a special case where employment levels have been used to measure foreign investments with regards to technology. At the start of the case, it was argued that employment levels and GDP are major factors that directly influence FDI in a country. These two factors are greatly affected by the R&D expenditure of a country and its technological development. Hence conclusion of the study reached the point that technology is an indirect influence over FDI in any country. Technology seems to affect GDP and employment levels, which in turn affects the foreign investments of a country.

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