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The role of human capital and infrastructure development in attracting FDI: A study of Indian states

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Abstract
Foreign direct Investment is a preferred source of capital in developing countries who are invariably in need of funds for development purposes. Foreign investors look for certain characteristics of the host economy which make them favourable for investment. The presence of skilled labour and infrastructure facilities are two such preconditions of the host country that tend to increase the profitability of the foreign investment. This paper studies the states of India which are recipients of the major share of FDI inflows in India and finds that the states which are in receipt of maximum FDI are also high on human capital and infrastructure development. When all the states of India for which data is available are taken into account to ascertain whether human capital and infrastructure development influence the amount of FDI, the paper finds support for the proposition that infrastructure development affects the choice of location for foreign investment while human capital does not play a decisive role in influencing FDI.

Keywords: FDI, human capital development, infrastructure development

Introduction

Foreign direct investment in India was recognised and was a conspicuous part of the the new economic policy announced in July, 1991 and since then there has been no looking back. The meaningful role foreign direct investment (FDI) plays in stimulating and furthering economic growth has been recognised and there has been a gradual liberalisation in the FDI policy since then, both at the centre and the state level. Continued efforts are being made by the centre and states to encourage and solicit FDI and to augment its domestic investment to facilitate economic growth.

Ample capital resources, up to date technology and effective management practices are key to economic advancement and development. Developing countries are deficient in all of these. They may need foreign capital to either fill their trade- gap due to imports greater than exports or else for investment purposes, when their savings fall short of funds required for domestic investment. FDI as an important source of capital may result in capital formation in the receiving economy.

FDI also enables transfer of technology from the home to the host country which may also lead to better and more competitive products both for domestic consumption and exports. Export competitiveness further adds to openness and integration with the global economy. Not only knowledge spillovers, FDI also transmits best practices in corporate governance, and other accounting and legal practices which add value to the firms. Hence, there is an enhancement in the overall skills which further increases efficiency and productivity [1].

FDI is for a longer - term than other forms of financing like portfolio financing, creates a lasting relationship and thus is considered a more stable source of finance. Along with its potential for generating spillovers of technology and knowledge FDI is a driver of growth and development. Thus, developing countries continuously look out for FDI [2].

Foreign investors and firms while making their investment decisions & while choosing where to invest, look for certain characteristics in the host economies. To name a few, presence of skilled and cheap labour, availability of good communication and infrastructure facilities and supportive government policies [3]. The presence of these factors creates a good and favourable investment climate for the foreign investors.

FDI tends to benefit, that is, increase productivity in places where there is presence of skilled workforce and well developed physical infrastructure i.e. where the absorptive capacity is higher (Borensztein, De Gregario, & Lee, 1998). Also these factors *viz*. skilled workforce & well-developed physical infrastructure seek to attract FDI to locations where they are present [4].

Reenu Kumari and Anil Kumar Sharma (2017) used unbalanced panel data of 120 developing countries of Asia to identify key determinants of FDI. They found out that market size, trade openness, interest rate and human capital were key determinants of FDI in these countries [5]. Nor Aznin Abu Bakar *et al*. (2012) studied the impact of infrastructure on Foreign Direct Investment in the case of Malaysia during the period 1970-2010 using time series data. According to their study infrastructure has a significant and positive effect on FDI inflows into Malaysia [6]. In a study on the determinants of FDI in the fast growing BRICS and MINT countries, Simplice Asongu *et al*. (2018) found out that market size, infrastructure availability and trade openness plays the most significant roles in attracting FDI to these countries [7]. Noorbaksh, Paloni and Youssef (2001) and later Nunnenkamp (2002) have shown the relevance of the availability of local skills as a pull factor of FDI [8, 9].

Manpreet Kaur, Surendra S Yadav and Vinayshil Gautam (2013) in their study in the Indian context concluded that improving infrastructure facilities and level of education provides a supportive environment to foreign investors and hence positively affects FDI inflows [10]. Vrinda Gupta (2017) uses panel regression to show that in India human capital does have a role to play in influencing FDI. According to her other factors like market size, availability of cheap labour and physical infrastructure in the form of power supply seem to be the main determinants [11]. Chatterjee *et al*. (2013) in their study on Inter-state variations in FDI found out that infrastructure does not have a significant role in determining inter- state differences in FDI inflows. According to them the level and variations in the profits of the existing firms in the state have an effect on the choice of location of FDI [12].

Thus, studies in the Indian context also show mixed results. In India the services sector and the information technology industry are recipients of high FDI. They are also skill-based and require the right kind of infrastructure. We will focus on these two indicators *viz* skilled labour and infrastructure in our study as pull factors for foreign direct investment in the Indian scenario.

To add to the knowledge pool of the existing research on the subject and to add a new dimension to it, first we take into account the data of only the states which receive the highest FDI inflows and draw meaningful inferences on the role of human capital and infrastructure in influencing FDI. We then run a regression on FDI data on the one hand and a) human capital (represented by literacy rate and HDI) and b) the score on infrastructure on the other, for all states (according to availability of data). Though there are many factors which can lead to an increase in FDI as we've noted earlier, we've limited our analysis to only two, that is, Human capital and infrastructure.

The paper is organised as follows. First, we study the data for the states which received the highest FDI inflows and also examine their score on literacy, HDI and Infrastructure to make an informed assessment about whether FDI is caused by the presence of these factors. Then the data for all states of India is taken for all these variables and results of regression used for drawing inferences. Conclusions are reached and recommendations made.

Analysis and interpretation

India is a federal republic with states pursuing their own policies and creating enabling conditions to attract foreign investment. On a close perusal of regional distribution of foreign direct investment in India we notice that FDI inflows have gone primarily in favor of a few states - Delhi, Maharashtra, Karnataka, Tamil Nadu, and Gujarat- during the period January 2000 to September 2019. Even the World Bank observed that there was concentration of FDI flows within India. According to the World Bank (Global Development Finance, 2002) in India the top five recipient states accounted for 75% of the approvals in 2000.

Table 1: Relationship between FDI, Human Capital and Infrastructure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	FDI Inflow	**Rank in Infrastructure**			**Literacy rate**			**HDI**
		2005-06	2014-15	2017	2001	2011	2017-18	2018
Maharashtra	29%	6	8	38.3 (3)	76.9	82.3	84.8	0.696(15)
Delhi	21%	1	1	75.6 (1)	81.7	86.2	88.7	0.746(5)
Karnataka	9%	8	6	33.8 (7)	66.6	75.4	77.2	0.682(19)
Tamil Nadu	7%	5	4	34	73.5	80.1	82.9	0.708(11)
Gujarat	5%	7	7	32.5(8)	69.1	78	82.4	0.672(21)
Total	100%	18	18	31.32	64.8	73	77.7	0.647*

Source: (1) FDI Annual issue, 2019
(2) & (3) Mint calculation, 22May2017, based on data from CMIE, NFHS, MOSP, &Economic survey
(4) From the NCAER state investment potential index
(5) & (6) Economic survey 2019-20
(7) Household social consumption education report
(8) sub national HDI areas based global data lab

We have taken into consideration the cumulative FDI inflows from April 2000 to September 2019. The literacy rates, the Human Development index (HDI, and, the score on infrastructure have been seen for three time periods from within this period 2000-2019, for which FDI inflows have been examined. All these factors viz. Literacy Rates, HDI and availability of Infrastructure vary widely across states.

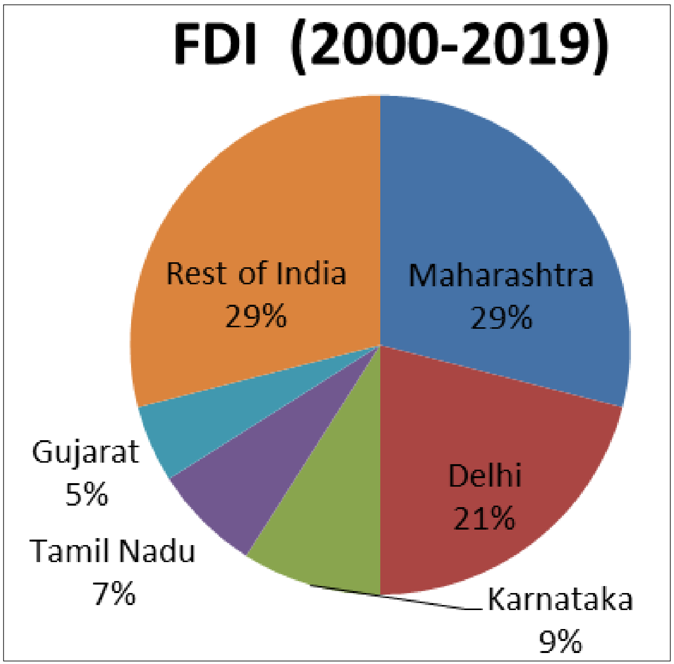

Fig 1: Proportion of FDI received by selected states of India during 2000 – 2019

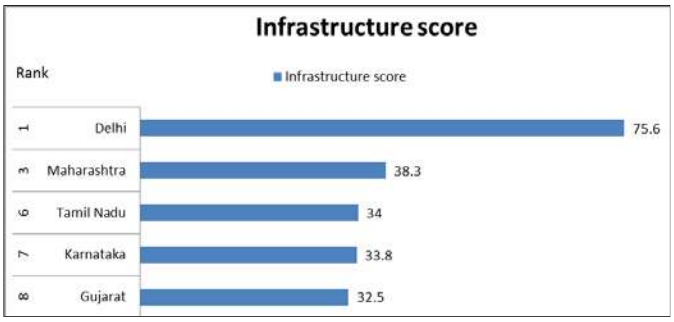

Fig 2: Infrastructure score state wise in 2017

The infrastructure index is based on the availability of road, rail and air transport, telecom facilities and power supply. Infrastructure is considered a key factor for investment decisions and for determining the choice of location for investment. Infrastructure development is not uniform amongst states. Presence of good infrastructure reduces cost and promotes efficiency in production and distribution. Its crucial role in the smooth running of business can make it a major determinant of investment decision by the foreign investor.

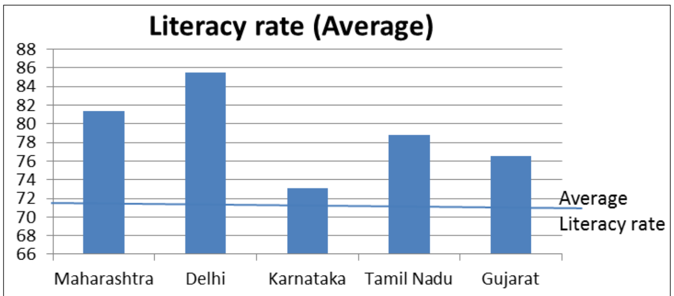

Fig 3: Literacy rate of selected states during 2000 to 2019

The availability of skilled labour is also of paramount importance and results in increased profitability and growth of business. The costs of training are considerably reduced if the workforce is skilled. Basic education lays down the foundation which is required for an individual to unfold his potential in acquiring skills. Literacy is the key indicator to assess whether a population is educated. For this reason, literacy rate is considered important for ascertaining the availability of skilled labour [13]. The literacy rate is defined by the Census of India, as the percentage of literate persons of 7 years and above. A person who can read or write a simple message in any language with understanding is considered a literate person (NSSO surveys). Human Development Index (HDI) of the various states has also been taken into account as a measure of human capital [14]. HDI is a composite index that takes into consideration three parameters viz health, education and per capita income. This aims to study the quality of human capital. It is assumed that a healthy, educated individual with a decent standard of living may be more productive.

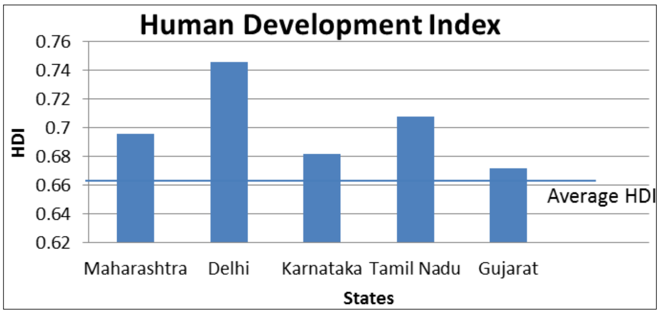

Fig 4: HDI of selected states

As can be seen 71% of the cumulative FDI inflows into India have found their way into these 5 states namely Maharashtra, Delhi, Karnataka, Tamil Nadu & Gujarat. On an examination of the literacy rates of these 5 states it is noticed that it is well above the All India average. The same is the case with Human Development Index. The score on infrastructure, also reveals the same; these states are ranked within the first 8 out of a total of 21 states for which the infrastructure index is calculated. Thus we can surmise that the five states which attract the highest foreign direct investment are also the ones which have a high score on literacy, HDI and infrastructure.

The relevance of these factors that is, Human capital and Infrastructure on FDI may be better captured by the more superior correlation and regression analysis. Hence, further analysis is made using these statistical measures.

To analyse the relationship between FDI inflows and its explanatory variables, following three models are used.

Model 1 $Y = \alpha + \beta 1SGDP + \beta 2$ Literacy Rate

Model 2 $Y = \alpha + \beta 1SGDP + \beta 2$ HDI

Model 3 $Y = \alpha + \beta 1SGDP + \beta 2$ Infrastructure index

In each model, Significance F is around 0.00 which indicates that the models are very well fitted. Adjusted R square ranges between 0.49 to 0.57, which shows that variations in dependent variable are explained by the models.

Model 1 shows that the coefficient of Literacy rate is positive but insignificant. Similarly, in model 2 Human development index has positive impact on the FDI inflows, but the coefficient is insignificant at 5% level. Nevertheless p value is quite near to 10%. In model 3, it was observed that infrastructure index is positively and significantly associated with the FDI inflow. The coefficient is significant at 10% level. GDP has been taken as a control variable because GDP/NSDP does lead to an increase in FDI. It has been done in order to isolate the effect of the independent variables (Human Capital and Infrastructure) on the dependent variable. In each model, GDP of states is positively and significantly associated with the FDI inflow.

	Model 1		Model 2		Model 3	
	Coefficients	**P value**	**Coefficients**	**P value**	**Coefficients**	**P value**
Intercept	-9.26	0.10	-12	0.02	-6.48	0.01
Literacy Rate (2017)	0.043	0.43				
HDI 2018			10.30*	0.13		
Infrastructure Index (2018)					0.058**	0.06
GDP (2019)	2.55***	0.00	2.42***	0.00	2.30***	0.00
Adjusted R square	0.496		0.54		0.575	
Significance F	0.001		0.000		0.00	

States GDP data taken from https://statisticstimes.com/economy/india/indian-states-gdp.php
Infrastructure data taken from NCAER State Investment Potential Index
Literacy data taken from Household Social Consumption Education Report
HDI data taken from sub national HDI areas based global data lab

Findings and Conclusions

The data on FDI inflows into various states of India was accumulated and to establish which factors influence the choice of location of FDI two possible determinants were examined. First, human capital represented by the literacy rate and Human Development Index and second, presence of good infrastructure measured by the infrastructure index. The study begins with an appraisal of the states of India which ranked the first five in receiving FDI. The corresponding values in the sphere of human capital and Infrastructure were scrutinised. The values for all these variables being high, much above the All India average lent support to the notion that the presence of good infrastructure and literate labour force along with good human development have a definite and positive effect in determining the choice of location for Foreign Direct Investment.

Subsequently, to analyse the relationship between FDI and the other explanatory variables *viz* human capital (represented by literacy rate and HDI) and infrastructure for all the states of India, regression models were used. It was found that though there is a positive relation between the independent variables Literacy & HDI and the dependent variable FDI in that they do influence FDI, they are not significant determinants, that is to say, they do not influence FDI in a big way. This may be due to the limited data taken in the study. Infrastructure shows a significant positive relation, and thus has a vital influence on FDI. These can especially be observed in the case of Delhi and Maharashtra with a very high score on both Infrastructure and FDI. GDP is positively and significantly related to FDI in all models, so a higher GDP (NSDP of states) plays a crucial role in increasing FDI.

It is worth noting though, that the five states which receive the highest FDI are also the ones with high NSDP, and having a high score on Human Capital and Infrastructure. This suggests that the positive causative relation exists not only between Infrastructure and FDI but a similar positive relation between Human Capital and FDI also can't be ruled out, though it is more relevant for 'forward states' having a high NSDP. The causal effect of Infrastructure on FDI has already been shown, by taking the data for all states, and performing regression analysis.

To improve our investment climate and entice foreign investors it is important for India and its states to improve in the area of infrastructure. Presence of good infrastructure removes the hurdles and hindrances in the smooth functioning of business. Reliable power supply, good roads and sufficient water supply, efficient transport infrastructure, communication and digital infrastructure are critical for any business to operate and function without obstacles and also lead to reduction of overall costs. State governments can improve their investment climate by investing in good infrastructure and even invite foreign investment in infrastructure.

The importance of skilled labour cannot be emphasised more for inviting FDI inflows in a developing country like India where the maximum foreign direct investment is finding it's way in the skill related sectors like the information technology industry and the services sector. Though, for the traditional manufacturing sectors low cost labour may be the more important factor but to be able to use and absorb the superior technology brought in by the foreign investors, a skilled workforce would be much more helpful and productive. Thus investment by state governments in human capital and upgradation of their skills would in the long run create a favourable investment climate for the states.

State governments will do well by investing to improve their infrastructure, literacy and human development in order to improve their attractiveness for foreign direct investment which will further foster economic growth.

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