Foreign Direct Investment : Governance and Infrastructure - A Study Across Indian States

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Abstract

This paper ascertained the pattern of FDI distribution across Indian states for the period from 1991-2013. FDI is unevenly distributed in India. The paper further located the factors that effect FDI inflows. An infrastructure and governance index was constructed, and regression analysis was done to analyze the effects of these variables on FDI inflows. Infrastructure, governance, size of the market, and market growth together explained significant variation in FDI distribution. Therefore, the governments at the Centre and State levels need to put in consistent efforts - by improving the physical and human infrasturcture as well as governance in states - to attract FDI.

Keywords: **FDI, infrastructure, governance, macroeconomic stability, political stability**

JEL Classification: C10, L90, N4, O16, R12

Paper Submission Date : March 14, 2014 ; Paper sent back for Revision : May 8, 2014; Paper Acceptance Date : June 10, 2014

The importance of investment is well observed in the literature of economics. With the growth of capitalism as a regime, money has taken a new form. According to Money Commodity Money (M-C-M') theory (Sweezy, 1942), the motive is to extract maximum profits by investing money into the market and converting it into a large amount such that returns (M') are greater than the invested money (M), which is thus reinvested back to make more money. Today, we live in a globalized economy where there is a tremendous flow of capital across the world, and there are no boundaries and limits to the pursuit of the ultimate goal of maximum profits. Capital, and precisely investment, is crucial for the growth of an economy. Macroeconomic theory suggests that marginal productivity of capital is high where it is short (Dornbusch & Fischer,2004). Therefore, the shortage of capital in developing countries makes it attractive for the surplus countries to invest their capital in these countries. There is a mutual benefit in the international movement of capital. This is evident from the fact that the FDI inflows to developing economies reached a new high of $759 billion, accounting for 52% of global FDI inflows in 2013 (UNCTAD, 2014).

Since the importance of foreign direct investment on the developed and developing world is well observed in literature, and it is also claimed that its distribution is highly uneven, thus it becomes crucial to determine the drivers and determinants of inward FDI flows. On one hand, there exists huge literature on determinants of FDI inflows and importance of FDI on growth (Ang, 2008 ; Aqeel & Nishant, 2005 ; Jensen, 2003). On the other hand, there is little econometric research on FDI and the role of governance (Adeoye , 2007 ; Globerman & Shapiro, 2002, 2003). There are studies on inter-state distribution of FDI in India (Bhanu Murthy & Sinha, 2010 ; Goldar, 2007; Rao & Murthy, 2006; Nunnenkamp & Stracke , 2007).

In India, there is not yet any comprehensive study on the effect of governance on FDI distribution at the state level. This research proposes to study the pattern of distribution of FDI among Indian states for the period from 1991-2013 and also attempts to investigate the relationship between FDI flows and their determinants with a special focus on governance as a determinant of FDI inflows. The expectation is that macroeconomic governance will have a positive and significant effect on inward FDI flows, thereby suggesting that the host country/state governments and authorities should shape policies in this area to maximize inward FDI flows. The study also

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examines the pattern of infrastructure and market conditions across the Indian states. They are expected to be highly correlated. Thus, this study will contribute to the existing literature by the analysis of the identified factors which are responsible for the state wise distribution pattern of FDI in India.

Literature Review

(1) FDI Inflows and Governance : In broad terms, governance encompasses laws, regulations, and public institutions that determine the extent of economic freedom in a country; the security of private property rights; the costs to the private sector for complying with government regulations and legislation; the competence and efficiency of the civil services in carrying out state activities that in turn affect the efficiency of the private sector enterprises; the transparency of the legal system; and the honesty of government officials (Globerman & Shapiro, 2002). Government infrastructure is an important determinant of both FDI inflows and outflow.

Globerman and Shapiro (2003) assessed whether and to what extent governance infrastructure attributes influenced U.S. FDI flows into various economies. They measured governance infrastructure in terms of the nature of political, economic, and legal institutions and policies. Their results indicated that countries which failed to achieve a minimum threshold of effective governance were unlikely to receive United States FDI. Asiedu (2003), in his econometric study of 22 countries of Africa over the period from 1984-2000 using fixed effect panel estimation technique, examined the determinants of FDI to Africa. The results showed that macroeconomic stability, efficient institutions, political stability, and good regulatory framework positively impacted FDI. He found that FDI to Africa was not solely driven by natural endowments. Jensen (2003), in a study of 79 countries of the world, showed that democratic governments attract a higher level of FDI as they are associated with lower country risk and better governance.

(2) FDI Inflows - Infrastructure and Other Variables : Chien-Hsun (1996) found in his inter region study of China that location of FDI is influenced by the existence of good transportation linkages, technological filtering, and to some extent, by the potential for market-share extension (especially in the middle region). However, this study contradicted a U.S. study as FDI is not influenced by consideration of labor cost differences and allocative efficiency.

In a similar kind of econometric study on Malaysia for the period from 1960-2005, Ang (2007) found that many results were in conformity with the study done in the context of United States, like real GDP has a significant positive impact on FDI inflows. Growth rate of GDP exerts a small positive impact on inward FDI. The study also suggested that increases in the level of financial development, infrastructure development, and trade openness promote FDI. On the other hand, higher statutory corporate tax rate and appreciation of the real exchange rate appeared to discourage FDI inflows.

(3) FDI Inflows and Indian States : Bhanumurthy and Sinha (2010), in their econometric study of Indian states for the period from 1991-2008, pointed out the role of equity and efficiency in determining the location of FDI destinations. According to them, the two relevant criteria for evaluating the performance of the Indian economy in regional terms, in respect of FDI flows, are equity and efficiency. The states which have low cost economic structure, along with other factors, will lead to efficiency and should ,therefore, attract large investable resources. Similarly, the states that have performed well in terms of growth of state domestic product deserve to get a larger share of FDI. They overviewed a very high elasticity of FDI flows with respect to SDP growth, which implies that states are not getting their fair share of FDI, and the equity principle is violated.

Goldar (2007), in a regression analysis of 100 cities belonging to different states of India, analyzed the location pattern of foreign companies in India. He found that the presence of a metropolitan city in a state, good investment climate, and level of civic amenities positively influenced the decision of foreign companies regarding plant location in the city. However, the variable 'wage cost' turned out to be insignificant, implying that low cost labor does not attract foreign investment.

Objectives of the Study and Hypotheses

➲ **Objective 1:** To observe the variations in FDI among Indian states and change in its concentration over the years.

➲ **Hypothesis 1:** Since 1991, FDI inflows and variation in its distribution among selected Indian states has not increased over the years.

➲ **Objective 2:** To identify the factors responsible for the variation in location of foreign investment between Indian states.

➲ **Hypothesis 2:** There are no specific factors responsible for variation in FDI distribution between Indian states.

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Methodology

FDI determinants are classified into two sets of factors: Quality of governance and physical & human infrastructure.

(1) Governance Related Factors : The following dimensions were taken to construct the state governance index: peace and stability, people's sensibility, social equality, and management of government, which are captured by estimates of crime rates, riots, industrial disputes and strikes, Gini's index, and debt- SDP ratio respectively (Basu, 2002). These variables are in compatibility with the factors that constitute the governance index developed by World Bank studies. This index developed by Kaufmann, Kraay, and Mastruzzi (2003) consists of six separate indices (referred to as KKM indices) including measures of political instability, rule of law, graft, regulatory burden, voice and accountability, and government effectiveness.

(a) Estimates of Crime Rate (ECR) : ECR focuses on peace and stability of a region. A low ECR signifies a safe environment and promotes investment.

(b) Estimates of Riots (ERI) : ERI predicts the chances of violence and instability breaking out in the states, which discourages investment by increasing the sense of insecurity and risk.

(c) Estimates of Industrial Disputes and Strikes (EIDS) : This indicator is a proxy for people's sensibilities; it measures the workers' dissatisfaction with their working conditions. It is expected to affect FDI inflows negatively.

(d) Gini Index (GI) : Social equality is another dimension measuring the quality of governance. A good-quality governance will always promote equality, which will encourage high FDI. The Gini index measures the extent of economic inequality in the economy. The higher the index value, the greater is the inequality in consumption expenditure in the state.

(e) Debt-SDP Ratio (DSR) : This indicator focuses on the functioning of the state governments in efficiently delivering public goods. Debt-SDP is, therefore, an important indicator of governance.

(2) Physical and Human Infrastructure Related Factors

(a) Rail Route Density (RRD) : The rail route density is measured by the length of rail route available per thousand square kilometers (km/'000 sq. km). High route density indicates that the state is well connected to other parts of the country and rest of the world (by seaport or airport) and ,therefore, is considered as a profitable destination from the investment point of view.

(b) Road Density (RD) : Road is another medium of transportation. Roads actually connect the factories and the market places. If road density is high, then the resources and markets are easily accessible.

(c) Proportion of Surfaced Roads in Total Roads (SR) : Surfaced roads are suitable for goods transportation, which is required in setting up a factory or its better functioning. It is always desirable for an entrepreneur to move to a state which has good roads, all other things being equal.

(d) Per Capita Electricity Consumption (PCEC) : It is used to capture the level of electricity services available in the states, which is an important factor in determining investment decisions.

(e) Literacy Rate (LR) : Human resource is an important factor that can influence the investment decision in a state. Literacy rate (LR) is one of the indicators of human resource in any state. Here, it is chosen to capture human resource, which is expected to affect FDI inflows positively.

(3) Other Factors Affecting FDI Inflows : Nunnenkamp and Stracke (2007) and Globerman and Shapiro (2002, 2003) found that market size and growth are important determinants of FDI inflows. Big market size (net domestic product of states) and market growth promotes FDI inflows. Even if market size is small, rapid growth in the market may attract foreign investors.

(4) Construction of the Index Using Principal Component Analysis : Principal component analysis is a technique designed primarily to synthesize a large number of variables into a smaller number of general components, which retains the maximum amount of descriptive ability.

➲ **Step 1:** Transform the indicators into their standardized form, that is,

$$X_k = \frac{x_k - \bar{x}}{s_x}$$

where,

$\bar{x}$ is the arithmetic mean,

s_x is the standard deviation of indicator X,

X =1,2,3,4,5,…….m.

➲ **Step 2:** Correlation coefficient of the m number of indicators is taken. The correlation coefficient is arranged in a matrix form, and is denoted by a correlation matrix.

➲ **Step 3:** Then solve the determinant equation $|R - \lambda I| = 0$ for all λ , where R is $m \times m$matrix ; this provides a m^{th} degree polynomial equation in λ and hence has m roots. These are called eigenvalues of R. Let us arrange λ in the descending order of magnitude as :

$$\lambda_1 = \lambda_2 = \lambda_3 = \ldots\ldots\ldots\ldots\ldots = \lambda_m$$

There are a number of views available regarding selection of a number of eigenvalues. Some theories argue to take the number of eigenvalues which explains satisfactory levels of variability, say more than 70%. Exclude those principal components whose eigenvalues are less than average $\sum_{i=1}^{m} \lambda_i / m$.

The original total variance of the indicators is m. Because x_1 , x_2 , ..., x_m are standardized indicators, each having zero mean and unit variance, the sum of their variance is 1+1+1+……+1 (m-times)= m. This is the same as

total variance of the all components. The solution , however, suggests that the variance of a component is equal to the eigen value (λ_i) of the eigen vector used for it. The descriptive power of each component, that is, the proportion of the total variance that each factor accounts for is expressed as the ratio λ_i / m.

Since $\sum_{i=1}^{m} \lambda_i = trace\ (R)$. This method then retains those components for more variance than the average for the variables. As components are executed from the correlation matrix, *trace (R) = m* and the average , therefore, is 1. Components with eigenvalues less than 1 are ,therefore, excluded (Kaiser, 1960).

➲ **Step 4:** Corresponding to each value of λ, solve the matrix equation $|R - \lambda I|\ \alpha = 0$ for the $m \times 1$ eigenvector α, subject to the condition that $\alpha\alpha' = 1$. The eigenvectors are :

$$\alpha_m = \begin{pmatrix} \alpha_{m1} \\ \alpha_{m2} \\ \alpha_{m3} \\ . \\ . \\ \alpha_{mm} \end{pmatrix} \quad \text{for} \lambda_m$$

This analysis is restricted to the eigenvalues whose value is greater than 1 because eigenvalues less than 1 account for a small amount of total variance and account for less variance than did the original variable (which had a variance of 1), therefore, are of little use.

➲ **Step 5:** The P_1 or the first principal component is constructed in the following way :

$$P_1 = \alpha_{11}x_1 + \alpha_{12}x_2 + \alpha_{12}x_3 + ... + \alpha_{1m}x_m$$

Where x_1, x_2, x_3, ..., x_m is the value of first, second, third…….and m^{th} indicator respectively for any observation. If the indicator is for observation 1, then it is the first principal component score for observation 1. Similarly, the second principal component score is derived, and so on.

➲ **Step 6 :** The index is estimated as weighted average of principal components (PCs) :

$$I = \frac{P_1\lambda_1 + P_2\lambda_2 + ...P_m\lambda_m}{\lambda_1 + \lambda_2 + ...\lambda_m}$$

Where the weights are the eigenvalues of correlation matrix *R* and

$$\text{Var}\,P_1 = \lambda_1, \text{Var}_2 = \lambda_2 ..... \text{Var}\,P_m = \lambda_m$$

The raw scores of the index are obtained from the above steps. The normalized scores are obtained as:

$$I^K = \frac{I^k - \text{Minimum}\ (I^k)}{\text{Maximum}\ (I^k) - \text{Minimum}\ (I^k)}$$

where,

$k = 1, 2, 3……., n$, where 1 indicates best performer and 0 indicates worst performer. Ranks for different states can be derived by rescaling the index value from 0 to *n*.

Analysis and Results

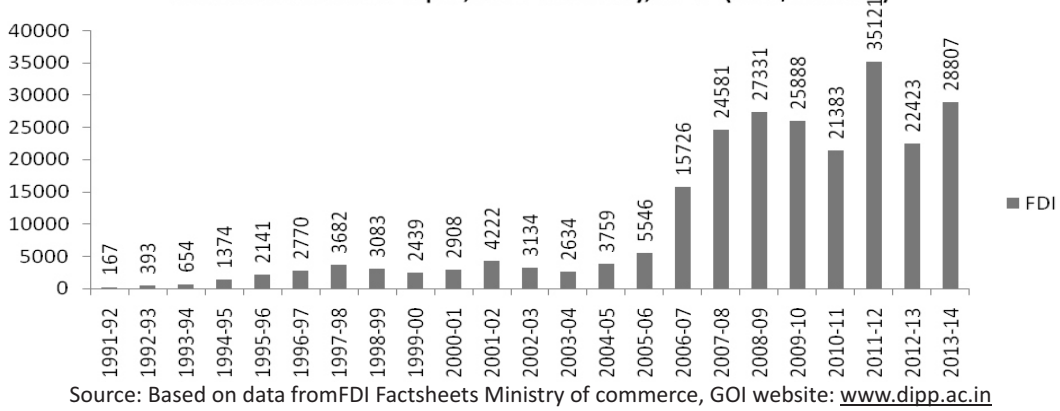
(1) Empirical Analysis of FDI Inflows Across Indian States

➲ **Trends in FDI Inflows in India :** FDI was coming into India even before 1991, its quantum surged after the liberal policy reforms of 1991. The Figure 1 shows that FDI increased from $167 million in the beginning of 1991 to $1374 million in 1994-95 and further to $3682 million in 1997-98. FDI flows into India, after rising sharply till 1997-98, showed a declining trend since 1998. The reason for this downslide was the failure to improve the macro-economic and organizational framework. FDI actually dropped from $ 3083 million in 1998-99 to $ 2439 million in 1999-2000, after which the declining trend discontinued and FDI increased to $2908 million in 2000. But the real surge came in year 2001, taking FDI inflows to the level of $4222 million.

Before 2002, RBI's estimation of FDI was not as per IMF standards. In 2002, an expert committee headed by Mr. Shrinivas from DIPP recommended that India should follow the international definition given in balance of payment manual published by the IMF (International Monetary Fund, n.d.). As per this manual, there are three main components of FDI, that is, equity capital , reinvested earnings, and other capital. But in India, prior to 2002, FDI included only the equity capital out of the above three. In 2003-04, FDI fell as compared to its 2002-03 figures. The reduction is attributable to a small decline (US$379 million) in fresh equity capital inflows in 2003-04. The declining trend of FDI flows into India appeared to have reversed during 2004-05, with such flows of $ 3759 million . In the year 2007-08, the total FDI inflows touched $24581 million. The trend supports the fact that whenever India has liberalized its policies, the foreign investors have always welcomed such policy decisions; other factors at work are India's demographic structure, rising disposable income, increasing urbanization and rising middle class, which has a positive effect on foreign investors' decision making.

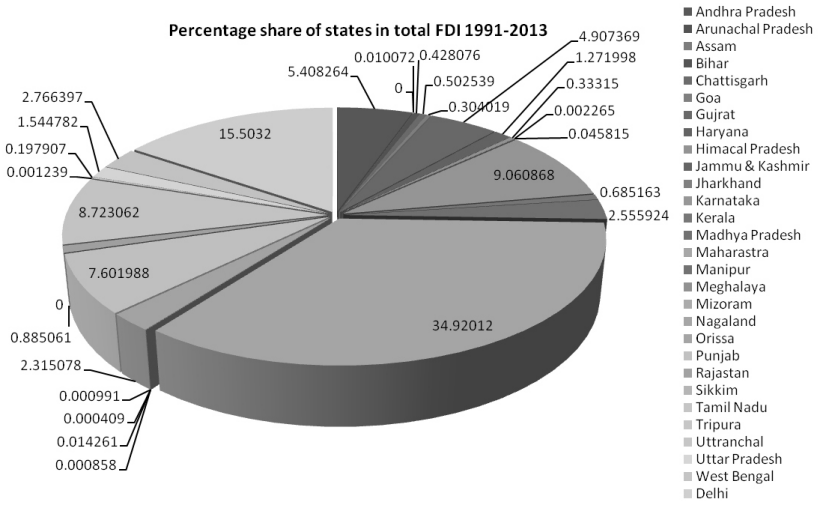
In the following year (2008-09), the FDI figures touched the value of $27331 million, but in the year 2009-10 and subsequently in 2010-11, it fell marginally due to the global financial crisis . The huge increase of FDI in the year 2011-12 was due to the fact that India has always been an attractive destination for foreign investors. The Reliance Industries-British Petroleum deal (BP Deal for $7.2 billion) in February 2011 significantly contributed to this upswing. Secondly, this could also be because there was less negative news about the Indian economy that year as compared to 2012-13, where FDI decreased to $2243 million. In order to increase FDI flows into India, the government has taken several policy measures such as allowing FDI in multi-brand retail and civil-aviation sector and increasing FDI cap in insurance and pension sectors. However, the economic crisis that India is facing is hitting the foreign investment badly. Overall, the FDI inflow to India has gone up considerably in the past, but one can expect that the flow will grow only if the government further liberalizes and introduces a correct policy mix related to FDI.

Figure 1: FDI inflows to India - April 1991 - January 2014



Source: Based on data fromFDI Factsheets Ministry of commerce, GOI website: www.dipp.ac.in

Figure 2. Percentage Share of States in Total FDI (1991-2013)



*Constructed on the basis of source: Approved FDI: www.indiastats.com and Handbook of Industrial Statistics (various editions), Ministry of commerce and industry, GOI.

➲ **Inter-State Variation in FDI Approvals (1991 - 2013) :** In this section, the distribution of FDI in the period from 1991-2013 is studied. As presented in the Figure 2, FDI was concentrated in a few states over the entire period of the study. Maharashtra stood first (34.92%) followed by Delhi (15.5%), Karnataka (9%), and Tamil Nadu (8.7%). The above mentioned states constituted the top rung that together accounted for more than 67% of the total amount of approved FDI. Punjab (7.6%), Andhra Pradesh (5.4%), and Gujarat (4.9%) also attracted a fair share of FDI. States like Uttar Pradesh, West Bengal, Odisha, and Madhya Pradesh approximately received 2% - 3% of the total share of FDI. These states together constitute the middle group .Other states that constitute around 1% share are Haryana and Rajasthan. The remaining states like Bihar, Chhattisgarh, Himachal Pradesh, Uttarakhand , Jharkhand, Kerala, and other North Eastern states (Manipur, Meghalya, Mizoram, Sikkim, Assam, Nagaland) attracted negligible share (less than 1%) of FDI approvals and constitute the bottom group states. This analysis shows that FDI to India is heavily concentrated in a few states, namely the top group states.
Now, we divided the time period of the study into two sub - periods.

The Tables 1 and 2 show the comparison between the share of states in total FDI approvals from 2008-2013 with that of 2002-2007. There was an increase in the share of FDI received by Punjab, Uttarakhand, West Bengal, and Bihar, out of which Punjab and West Bengal showed some significant changes. The FDI share of West Bengal constituted 2.47% in 2008-2013, up from its previous figure of 1.47% in 2002-2007, and that of Punjab rose to 13.69% in the same period . Assam, Goa, Kerala, Uttar Pradesh, and other North Eastern states did not show any major change in their share of FDI over time. On the other hand, Andhra Pradesh, Gujarat, Delhi, Haryana, Tamil Nadu, and Karnataka showed a decline in their FDI share for the same period. The FDI share of the respective states, as inferred from the Tables 2 and 3 in 2002-2007, was as follows : Andhra Pradesh (6.33%), Delhi (12.61%),Haryana (1.26%), Tamil Nadu (6.19%), Karnataka (13.86%). Share in 2008-2013: Andhra Pradesh (2.54%),Delhi (9.84%),Haryana (0.399%), Tamil Nadu (3.76%), and Karnataka (3.93%). The remaining states showed a similar pattern in the two sub - periods.

➲ **Coefficient of Variation - A Measure of Dispersion of FDI Distribution :** The Table 3 shows that FDI was the least unequally distributed in late 1990s, and the variation was high in the early 1990s. The coefficient of variation is 231.94 for 1991-1995, probably due to the immediate effect of industrial reforms and the new liberalization and globalization policy of 1991, which allowed foreign investors to invest in the location of their choice (profitable locations) in India. The variation in the recent years (2002-2007) is 218.9, which is less than what it was in the

Table 1. Percentage Share of States in FDI Approvals (2002-2007)

States	2002-2007(Jan-Dec)
Andhra Pradesh	8.882743609
Arunachal Pradesh	0
Assam	0.051143151
Bihar	0.000256357
Chhattisgarh	2.635047258
Goa	0.226804423
Gujarat	4.925309066
Haryana	1.267569688
Himachal Pradesh	1.242703093
Jammu & Kashmir	0
Jharkhand	0.212519661
Karnataka	13.8621539
Kerala	0.538662285
Madhya Pradesh	0.166176076
Maharashtra	37.28516601
Manipur	0
Meghalaya	0
Mizoram	0
Nagaland	0
Orissa	0.286687912
Punjab	6.669374552
Rajasthan	0.867339992
Sikkim	0
Tamil Nadu	6.19138334
Tripura	0.003432331
Uttarakhand	0.040774949
Uttar Pradesh	0.558569803
West Bengal	1.470199679
Delhi	12.61598857
Standard deviation	**7.550958277**

Note: Figures calculated are in percentage of total FDI approvals to 29 states. Constructed on the basis of FDI Data obtained from www.indiastats.com and Handbook of Industrial statistics(various edition),GOI

Table 2. Percentage Share of States in FDI Approvals (2008-2013)

States	% Share of States in Approved FDI (2008-13)
Andhra Pradesh	2.5492
Assam	0
Bihar	1.2296
Gujarat	1.523
Haryana	0.399
Himachal Pradesh	0.00099
Karnataka	3.9349
Kerala	0.435
Madhya Pradesh	0.136
Maharashtra	42.35
Orissa	0.106
Punjab	13.69
Rajasthan	0.019
Tamil Nadu	3.762
Uttar Pradesh	0.508
West Bengal	2.7099
Chhattisgarh	0
Jharkhand	0.0002
Uttarakhand	0.447
Chandigarh	0
Delhi	9.84
Goa	0.076
Puducherry	0
Standard Deviation	**8.89**
Coefficient of variation	**244.45**

*Figures are calculated as percentage of total FDI approvals to India. Constructed on the basis of FDI Data obtained from www.indiastats.com and Handbook of Industrial statistics, GOI.

Table 3. Coefficient of Variation

Years	1991-1995	1996-2001	2002-2007	2008-13
coefficient of variation	231.9490879	159.2296002	218.9777776	244.45

*Constructed on the basis of FDI Data

early 90s, but higher than what it was in 1996-2001. This signifies an increase in variation in FDI among Indian states since 1996. The coefficient of variation for 2008-2013 is 244.45, which is the highest value for all the periods. FDI has remained constituted in a few states, as is evident by an increased variance over time. While stretching upon a convergence among the regions, this, in fact, lead to a divergence among the Indian states.

(2) Construction of Indices and Regression Analysis

➲ **Construction of Physical and Human Infrastructure Index and Governance Index :** The entire time period for the present study is divided into four parts : 1991-1995, 1996-2001; 2002-2007, and 2008-2013. The indices were constructed for the initial year of each subdivision 1991,1996 ; and 2002 and 2008 in order to locate the possible determinants of FDI destination in Indian states and to minimize any reverse causation.

Table 4. Estimates of Physical and Human Infrastructure Index

States	1991	1996	2002	2008
Andhra Pradesh	-0.459218357	-0.097577847	-0.255048542	-0.21365
Assam	-0.829550895	-1.043892978	-0.771463785	-0.93541
Bihar	-0.821916524	-0.738209261	-0.589604774	-0.85406
Goa	0.532723875	0.672191013	0.347445972	1.073928
Gujarat	0.505246861	0.78810044	0.426207828	0.626979
Haryana	0.522254709	0.681876533	0.405252122	0.632334
Himachal Pradesh	-0.490222428	-0.34362684	-0.279087234	-0.00244
Karnataka	-0.12884151	0.039991434	-0.148258938	-0.29464
Kerala	0.14370685	-0.475488697	-0.234265383	-0.12348
Madhya Pradesh	-0.56152331	-0.382121266	-0.486178654	-0.46924
Maharashtra	0.27615753	0.494673528	0.158260019	0.265927
Orissa	-0.980720741	-0.869370987	-0.823823148	-1.00115
Punjab	0.967067153	1.009168403	1.630279813	0.713343
Rajasthan	-0.658685549	-0.296799569	-0.304653724	0.015762
Tamil Nadu	0.289019492	0.305587124	0.229714714	0.416478
Tripura	-0.914945202	-0.932859912	-0.751131359	-0.68643
Uttar Pradesh	-0.562496837	-0.42052608	-0.341291378	-0.19839
West Bengal	-0.195302545	-0.21741775	-0.159170975	-0.62604
Delhi	3.367247429	1.826302714	1.946817426	1.66017

*Estimated using Principal Component Analysis

The principal scores for physical and human infrastructure calculated in the Table 4 are normalized using the formula:

$$I^K = \frac{I^k - Minimum\ (I^k)}{Maximum\ (I^k) - Minimum\ (I^k)}$$

Where $k = 1, 2, 3\ldots\ldots, 19$.

The normalized physical and human infrastructure index was obtained (Table 5). Here, the value 1 indicates the best performing state and 0 indicates the worst performing state.

Table 5. Normalized Physical - Human Infrastructure Index

States	1991	1996	2002	2008
Andhra Pradesh	0.119941629	0.329704046	0.205286319	1
Assam	0.034767928	0	0.018897927	0.024702
Bihar	0.036523776	0.106502744	0.08453582	0.055268
Goa	0.348080887	0.597897905	0.422743076	0.779717
Gujarat	0.34176138	0.638281711	0.451170385	0.611774
Haryana	0.345673057	0.601272421	0.443606898	0.613786
Himachal Pradesh	0.112810925	0.243978534	0.196610098	0.375268
Karnataka	0.19592582	0.377634325	0.24382961	0.265473
Kerala	0.258609895	0.198036769	0.21278753	0.329786
Madhya Pradesh	0.096412258	0.230566757	0.121865137	0.199867
Maharashtra	0.289072556	0.53604934	0.354460689	0.476107
Orissa	0	0.06080491	0	0
Punjab	0.447976576	0.715303624	0.885752914	0.644226
Rajasthan	0.074065674	0.260293544	0.187382452	0.382107
Tamil Nadu	0.29203071	0.470170067	0.380250644	0.532678
Tripura	0.01512788	0.038684842	0.026236456	0.118254
Uttar Pradesh	0.096188355	0.217186201	0.17415892	0.301639
West Bengal	0.180640282	0.287950829	0.239891157	0.140946
Delhi	1	1	1	1

*Estimated using Principal Component Analysis

➲ **Governance Index :** The same methodology was used to estimate the principal scores for governance index (as shown in the Table 6) and normalized governance index is depicted in the Table 7. As depicted in the Table 7, the value 1 indicates the worst performing state in terms of good governance, and 0 indicates the best performing state.

(3) Relationship Between Approved FDI and the Index Constructed - Regression Analysis : A regression analysis of FDI and its determinants was performed for the top 19 Indian states. The regression was performed by pooling the observation for the four sub periods 1991-1995,1996-2001, 2002-2007, and 2008-2013. Three time dummies were included for different sub periods to take into account the peculiarity of different periods. The following cross-sectional model was estimated:

$$\widehat{\text{FDI Share}} = b_0 + b_1 d_{96} + b_2 d_{02} + b_3 d_{08} + b_4 \text{mktshare} + b_5 \text{mktgrowth} + b_6 \text{infra} + b_7 \text{govern} + u_i \quad \ldots\ldots\ldots \quad (1)$$

where,

FDI Share: Percentage share of Indian states in total approved FDI,

d_{96}: 1for second sub period 1996-2001 and zero otherwise,

d_{02} : 1 for third sub period 2002-2007 and zero otherwise,

d_{08} : 1for fourth sub period 2008-2013 and zero otherwise,

Mktshare: Market share captured by per capita GDP of Indian states,

Mktgrowth: Market Growth captured by growth of GDP of Indian states,

Infra: Normalized infrastructure index of Indian states,

Table 6. Estimates of the Governance Index

States	1991	1996	2002	2008
Andhra Pradesh	-1.380178181	0.753672536	0.026531549	-0.33754
Assam	0.503516739	-0.176749067	0.535528883	-0.07689
Bihar	0.432844999	-0.884183629	-0.157829966	0.011792
Goa	0.973039134	0.05006029	-0.508639054	-0.24698
Gujarat	0.060711349	0.284648622	-0.208324773	-0.00607
Haryana	-0.401652867	-0.067814387	-0.010589185	-0.47422
Himachal Pradesh	-0.348370121	-0.354260827	-1.079171117	0.872131
Karnataka	0.812217561	0.070295383	0.567413189	-0.2314
Kerala	0.443016647	1.525049582	0.481675846	1.499407
Madhya Pradesh	-0.167395629	-0.395936066	0.115089397	-0.22681
Maharashtra	-0.856713683	0.008667804	0.56162734	-0.36081
Orissa	-0.245510333	-0.487568234	-0.786745624	-0.19316
Punjab	-0.218470995	-0.627564621	-0.488367089	-0.18182
Rajasthan	1.189659048	0.673339368	-0.475619965	0.109844
Tamil Nadu	-0.082568076	0.481046565	1.445752609	0.013191
Tripura	0.899881399	-0.536402999	-0.253140276	-0.42325
Uttar Pradesh	-0.120520041	-0.546263433	-0.236363182	0.010803
West Bengal	-0.314303265	-0.032556999	-0.155322902	1.187259
Delhi	-1.179203684	0.262520114	0.626494324	-0.94548

Table 7. Normalized Governance Index

States	1991	1996	2002	2008
Andhra Pradesh	0	0.679824667	0.437915274	0.248658
Assam	0.733001646	0	0.639504466	0.355269
Bihar	0.705501173	0.293634738	0.364898607	0.39154
Goa	0.915706757	0.387776457	0.225960118	0.2857
Gujarat	0.560692916	0.485146994	0.34490006	0.384234
Haryana	0.380773266	0.338850236	0.423213549	0.192753
Himachal Pradesh	0.401507165	0.219954963	0	0.743433
Karnataka	0.853126306	0.396175433	0.652132296	0.292071
Kerala	0.709459264	1	0.618175887	1
Madhya Pradesh	0.471929715	0.202656829	0.472988749	0.293948
Maharashtra	0.203695585	0.370595685	0.649840801	0.23914
Orissa	0.441532964	0.164623081	0.115815575	0.30771
Punjab	0.452054773	0.106514806	0.233988861	0.31235
Rajasthan	1	0.646480793	0.23903738	0.431645
Tamil Nadu	0.504938636	0.566665853	1	0.392113
Tripura	0.88723891	0.144353244	0.32715081	0.2136
Uttar Pradesh	0.490170399	0.140260476	0.333795404	0.391136
West Bengal	0.41476359	0.353484514	0.365891534	0.872326
Delhi	0.078205146	0.475962118	0.675531472	0

Note : Estimated using Principal Component Analysis

Table 8. Regression Results

Variables	Coefficient	Robust Standard Error	t-statistics	p-value
d_{96}	-3.93314	2.44142	-1.61	0.112
d_{02}**	-5.093889	2.498843	-2.04	0.045
d_{08}***	-12.00813	3.109904	-3.86	0.000
Mktsize***	.0000621	.0000177	3.51	0.001
Mktgrowth	.0499692	.1157209	0.43	0.667
Norminfra***	12.69875	3.601748	3.53	0.001
Normgov	-5.323686	2.58412	-2.06	0.047
Constant	1.836328	2.805179	0.65	0.575
No. of observations=76	F(7,68)=4.63	PROB>F=0.0003	R2=0.4833	Adjusted R2=0.4301

***significant at 1% 5% and 10%, ** significant at 5% and 10%,*significant at 10%
*Results obtained through OLS regression technique

Govern: Normalized governance index of Indian states.

➲ **Interpretation of Results :** The results depicted in the Table 8 are highly in line with the expectations about the effects of the explanatory variables on FDI destination and confirm the second hypothesis (H2) of this study. Infrastructure index had a positive effect on FDI share and turned out to be a significant variable at 1% level of significance. The results showed that when the infra-index is increased by 1, it will lead to around 12.6% increase in FDI share. On the other hand, the governance index had the expected negative sign, because 1 indicates worst performance and 0 indicates best performance and is significant. Time dummies and market size are among other significant explanatory variables. Market size captured by the state's net domestic product confirms that more advanced and big markets of Indian states clearly attract more FDI. The coefficient of market size is positive and significant at the 1% level of significance. The variable time dummies is consistently negative and significant (d_{02} is significant at the 5% level of significance and d_{08} is significant at the 1% level of significance). This could be due to downward fluctuations of FDI share over time of some big players like Delhi, Madhya Pradesh, Maharashtra, Haryana, and so forth. The significant negative time dummies imply that on an average, the FDI share in the time period 2002-2007 and 2008-2013 was less than what it was in 1991-1995 for the same level of infrastructure index, governance index, market size, and market growth.

This result points out that there are some other time related factors that could lead to fall in FDI share of the selected Indian states overtime, provided that there is no change in other explanatory variables. On the whole, the *F*-statistics confirm that the model specified above is significant.

Research Implications

Investments form the base of a country's economic growth. In a developing country like India, where bottlenecks exist at the supply-side, FDI can substantially boost the pace of growth. FDI inflows to India have been increasing over the years, but for the egalitarian distribution of the benefits through such investment in different parts of the country, some areas and sectors need the attention of policy makers. FDI is being concentrated in few states of India, and a large portion of India's geographical area is undiscovered. This study tried to find out some of the possible reasons for such a distribution pattern. Though foreign investors consider India as a safe and secure place from the investment point of view, infrastructure bottlenecks like unavailability of good roads, lack of rail-road connectivity, shortage of good-quality labor, low level of governance, and so forth at the state level hamper foreign direct investments in various states. The lack of these attributes is a major hurdle for the growth and profit churning from investment in different Indian states. If these problems can be addressed by the government not

just at the Centre, but also at the State level, the benefits that our country can reap from FDI will multiply manifold, and will also lead to convergence in terms of regional growth. Therefore, the new government should work on improving the quality of governance so as to attract FDI to improve the physical and human infrastructure in various states across India.

Conclusion

In the present study, an attempt has been made to establish the relationship between foreign direct investment (FDI) being made in Indian states and their infrastructure and governance level. A regression analysis was used to investigate the sensitivity of overseas investments to infrastructure and governance indicators. Governance has not been discussed much in the existing literature, especially regarding FDI inflows to Indian states. This study, by establishing a relation between FDI, governance, and infrastructure levels of Indian states, gives a policy indication of improvement in these factors which can lead to increased FDI inflows to the respective states.

The study begins with stating the flow of FDI to India after the economic reforms of 1991. The analysis shows that over the years, the Indian economy has witnessed a huge surge in FDI inflows. The fact figures show that FDI increased from US $167 million in 1991 to US $35121 million in 2011-12. However, due to a slowdown in the Indian economy, the FDI inflows decreased to US $22423 in 2012-13. The first hypothesis of the study is investigated and it was found that there is inequality in distribution of FDI among the states of India and its concentration in different states of India has increased over the years. The data shows that bulk of the FDI has gone to a few top rung states: Maharashtra, Delhi , Karnataka, and Tamil Nadu. The measure of dispersion witnessed an increase in variation of FDI distribution among Indian states in different intervals. The results in the period from 1991-2013 not only confirm spatial inequality in FDI inflow among different states of India, but also show that the magnitude of inequality has increased over the years.

The empirical results confirm a positive relationship between FDI and infrastructure and governance of the respective states. The infrastructure index has a positive effect on FDI . This reiterates the need for concrete reforms to improve India's investment and business climate. Substantial allocation of funds to power and energy sectors and transportation development and encouragement to private sector participation in infrastructure development can lead to the development of quality infrastructure. Governance also has a significant effect on FDI. A well governed state has less hassles created at the state level, which would result in large FDI inflows and ,therefore, resulting in the economic growth of the recipient and growth of its different economic and social indicators such as standard of living, literacy rate, and so forth, which thus confirms the efficiency principal. This result also confirms that more advanced and big market Indian states clearly attract more FDI.

The panacea of this deep-rooted problem of inequality in FDI distribution could not be easily achievable. A long term and sustainable process is required to achieve an egalitarian distribution, for which it is required that the Centre and State governments should try to improve the infrastructure situation in backward states and provide improved governance. Moreover, they could increase the outlay in the states to improve the human resource conditions of that state, like improving the educational levels, providing technical education, providing jobs to people, easy loans to medium and small entrepreneurs, and so forth. This could increase the home market size as well. The government can also go in for public-private partnership to build infrastructure. However, at the same time, the government must improve on the parameters of governance like labor disputes, controlling their debts, and so forth. Merely showing an intention to introduce user friendly regulations without addressing the core regulatory, institutional, and policy issues affecting FDI may not be enough to attract huge FDI. Unless governance and infrastructure improvement is in place, this mechanism would hardly work.

Limitations of the Study and Scope for Further Research

This study has considered only four data points ; instead, more data points can be considered in future research studies. The present study can be extended by taking into consideration the interdependence of dependent and

independent variables and conducting two stage least square or three stage least square analysis. More indicators can be considered to develop the governance and infrastructure index .

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