TOKYO UNIVERSITY OF FOREIGN STUDIES

Determinants of Foreign Direct Investment in India

Region-Sector-Wise Analysis

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Abstract: While there are a number of empirical studies on the impact and the determinants of Foreign Direct Investment (FDI), few of the research have been implemented in terms of India at the region level. In this paper, the determinants of FDI towards India (data from the period 2008-2013) would be examined region-wise, using state-wise data. Sector-wise GDP would be used as a variable in order to analyze which market being the significant determinant. It reveals that generally FDI in India is related positively with GDP per capita, length of state and national highways, GDP of service sector, number of telephones per 100 populations, and amount of natural gas produced. Especially the results revealed that the FDI inflows have a significant relation with the market size of the service sector of the initial year.

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1.Introduction

In recent years, Foreign Direct Investment (FDI) has been regarded as an important factor for economic development. As for India, the amount of FDI has an increasing trend, and also the Gross Domestic Product (GDP) is increasing every year. In most empirical studies, it is concluded that FDI contributes to both factor productivity and income growth in host countries, beyond what domestic investment would normally cause (OECD, 2002). This is considered to be also the same as for India (Kundra, 2009). With FDI and GDP's growing amount, the interest towards India as a destination of FDI has been growing in Japan, and recently India has assigned key agreements with Japan to share 'Special Strategic Global Partnership' (Chaudhury, 2014).

Under the consideration of previous empirical studies on the relation of FDI and GDP, it could be stated that FDI triggers economic development in India. As mentioned above, the amounts of FDI have an increasing tendency. However, the amount of FDI widely varies depending on each state. If more states be able to call in a larger amount of FDI, the economic gap among states would decrease. In addition, the whole nation would be enabled to increase its GDP.

The purpose of this thesis is to examine the determinants of FDI towards India. In this paper, FDI would be regarded as a positive factor on economic development. By using regression model and region-wise data, the determinants is to be observed. Finally to analyze how to promote and increase the amount of FDI that will benefit both the host and investing nations.

1.1. Terminology

In order to clarify the main terms used in this paper, some of the most important words would be defined in this section.

1.1.1. Foreign Direct Investment (FDI)

The term “FDI” is defined in the *Balance of Payments Manual Fifth Edition* (IMF, 1993) and in *Detailed Benchmark of Foreign Direct Investment: Third Edition* (OECD, 1996). According to UNCTAD, *“FDI refers to an investment made to acquire lasting interest in enterprises operating outside of the economy of the investor. Further, in cases of FDI, the investor´s purpose is to gain an effective voice in the management of the enterprise. The foreign entity or group of associated entities that makes the investment is termed the "direct investor". The unincorporated or incorporated enterprise-a branch or subsidiary, respectively, in which direct investment is made-is referred to as a "direct investment enterprise". Some degree of equity ownership is almost always considered to be associated with an effective voice in the management of an enterprise; the BPM5 suggests a threshold of 10 per cent of equity ownership to qualify an investor as a foreign direct investor.”*[1] In short, FDI are investments that are done to directly gain interests by administrating firms in host countries, such as M&A and

[1] UNCTAD “Foreign Direct Investment” (1999)

green field investment. It does not include investments which are done via securities (so called Foreign Portfolio Investment).

1.1.2. Gross Domestic Product (GDP)

The term "GDP" is defined in *SNA 1.128 and 2.173-2.174* (OECD, 2001). According to OECD, *"Gross domestic product is an aggregate measure of production equal to the sum of the gross values added of all resident institutional units engaged in production (plus any taxes, and minus any subsidies, on products not included in the value of their outputs). The sum of the final uses of goods and services (all uses except intermediate consumption) measured in purchasers' prices, less the value of imports of goods and services, or the sum of primary incomes distributed by resident producer units."*[2]

1.2. Discussion on FDI

FDI towards developing countries has become an international trend. In 2009, FDI by private equity funds and sovereign wealth funds together accounted for over 10% of global FDI flows. PE funds are also major contributors to cross-border M&A which was the main factor of the increase of global FDI (see Table 1). But in the recent years, according to UNCTAD[3], although the global FDI rose by 11%, the developing

[2] OECD "OECD Glossary of Statistical Terms" (2008)

[3] UNCTAD "Global Investment Trends Monitor No. 15" (2014)

nations are trapped in a historically low share (39%). Despite the information above, the amount towards developed countries increased by 12% to US$576 billion. FDI to the European Union increased, while flows to the United States declined. UNCTAD forecasts that the global FDI flows will rise gradually in 2014 and 2015, to US$1.6 trillion and US$1.8 trillion respectively.

Table 1. Cross-Border M&As by Private Equity Firms 2000-2010 (cited from “India`s FDI Inflows Trends and Concepts” by K.S. Chalapati Rao, Biswajit Dhar, 2011)

Year	Number of Deals		Value	
	Number	Share in Total (%)	$ billion	Share in Total (%)
2000	1,338	13	92	7
2001	1,246	15	88	12
2002	1,244	19	85	18
2003	1,486	22	108	27
2004	1,622	22	157	28
2005	1,725	19	205	22
2006	1,688	18	267	24
2007	1,906	18	456	27
2008	1,776	18	303	24
2009	1,987	24	106	19
2010*	696	22	38	16

Source: UNCTAD, *World Investment Report 2010*, Table I.4.
* For 2010, January–May only.
Note: Includes M&As by hedge funds. Private equity firms and hedge funds refer to acquirers as “investors not elsewhere classified”. This classification is based on the Thomson Finance database on M&As.

1.2.1. FDI as for India

India has been distinguished among the world as a FDI destination in recent years as well as its rapidly growing economy. According to UNCTAD[3], it has experienced a 17% growth in FDI inflows, to US$28 billion. As a member nation of the BRICS, India has been continuing to be a strong performer in attracting FDI. BRICS`s current share of global FDI flows are 22%, which is as twice of its number before the financial crisis in 2007-08. In late 2012, 6 nations including India which are ASEAN's FTA partners launched the negotiation of the Regional Comprehensive Economic Partnership (RCEP). According to UNCTAD[4], India has concluded negotiations with ASEAN on trade in services and on investment on December 20, 2012. In addition, an FTA between EU and India are under negotiation since 2007. This is expected to include a substantive investment protection chapter.

1.3. Discussion about FDI Impact on Economic Growth

Although there are many theories about the FDI impact on economic growth, many of them claim that FDI has a positive effect on host countries' economic growth. Generally, FDI is considered to bring various benefits such as technology development, increase of employment, and expansion of international networks and so on.

[4] UNCTAD "IIA Issues Note No. 3" (2013)

In the recent years, the positive economic effect of FDI in both host and home countries has come to be more and more appreciated. According to Jun and Brewer[5], The interest in the broader role of FDI in sustainable development has been increased. As noted by Feldstein[6], there are several advantages that could be gained by the FDI host state. Firstly, FDI would enable the transfer of technology. This type of benefit would especially work on technology that cannot be gained through financial investments or trade in goods and services. It would also promote competition in the domestic input market. Secondly, the recipients of FDI can gain employee training in terms of operating new businesses that would contribute to human capital development. Thirdly, the profits gained by FDI contribute to corporate tax revenues in the host country.

It is considered that the contribution of FDI to sustainable development depend on combinations of project features and government policies in any case. In order to improve the contributions, Jun and Brewer[7] state that a variety of public sector institutions as well as corporations could develop policies that will increase the contribution.

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[5] Kwang W. Jun, Thomas L. Brewer and the World Bank "The Role of Foreign Capital Flows in Sustainable Development" (1997)

[6] Martin Feldstein "Aspects of Global Economic Integration: Outlook for the Future" (2000)

[7] Kwang W. Jun, Thomas L. Brewer and the World Bank "The Role of Foreign Capital Flows in Sustainable Development" (1997)

This also includes host government policies. However, the host government must be mindful of the potentially harmful effects of FDI projects. Jun and Brewer also mentions as cited below. *"Improving the contributions of foreign capital to sustainable development, however, requires much more than simply increasing the amounts of foreign investment in developing countries. It also requires host government policies that foster competition (and control restrictive business practices) within the economy and that allow the diverse types of international transactions that are essential to the successful operation of typical FDI projects. Such policies will maximize the potentially beneficial contributions of FDI projects to sustainable development."*[7]

1.4. Government of India FDI Policies

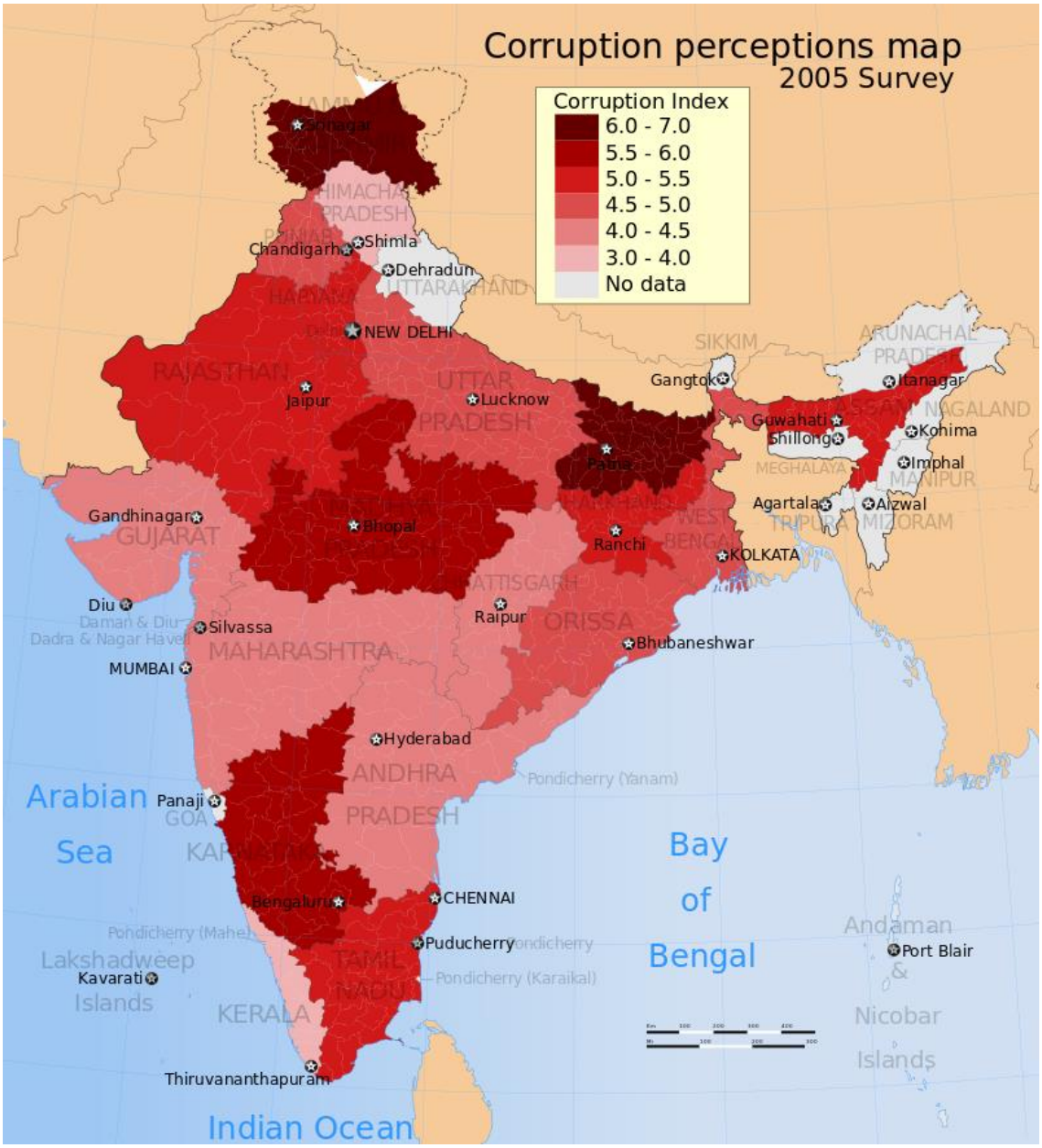
It could be said that FDI in India started with the establishment of East India Company in 1600. After the Second World War, Japanese companies started to invest in the Indian market. Although India has been noticed as a huge market and destination of FDI, its government policy towards FDI has went through many changes. The policy also varies depending on each state government. After the independence of India, the attention towards business of multinational corporations (MNCs) rose, especially for the policy makers. In 1965, an industrial policy was made allowing the MNCs to venture through technical collaboration. Therefore, the government of India adopted a relatively liberal stance by allowing more equity.

The corruption has been considered as a major obstacle by the MNCs when investing in India. As a whole nation, India ranked 142nd out of 189 nations in the *Ease of Doing Business Index*[8] in 2014. It is considered corruption is still large. In addition, the federalism is making this issue more complex to the MNCs since the level of corruption differs largely depending on each state (see Figure 1). However, Aam Aadmi Party (AAP), which is a state political party based on Delhi (NCR) putting up an ideology of anti-corruption, has won 28 out of 70 seats in the 2013 Delhi legislative assembly election. With no party obtaining an overall majority, the AAP emerged as the second largest party in NCR. In the 2014 Indian general election (which was held to constitute the 16th Lok Sabha, electing members of parliament for all 543 parliamentary constituencies of India. Run in nine phases from April 7 to May 12, 2014), the Bharatiya Janata Party (BJP) won 31.0% of all votes and 282 (51.9%) of all seats[9]. For results of the national and regional parties by alliances, see the figure below (Figure 2). It was the first time since the 1984 Indian general elections that a single party winning enough seats without the support of other parties. The BJP parliamentary leader Narendra Modi, who led a positive FDI policy as the previous State Prime Minister of Gujarat, was sworn in as the 15th Prime Minister of India on 26 May 2014.

[8] World Bank "Doing Business 2015 Economy Profile 2015 India" (2014)

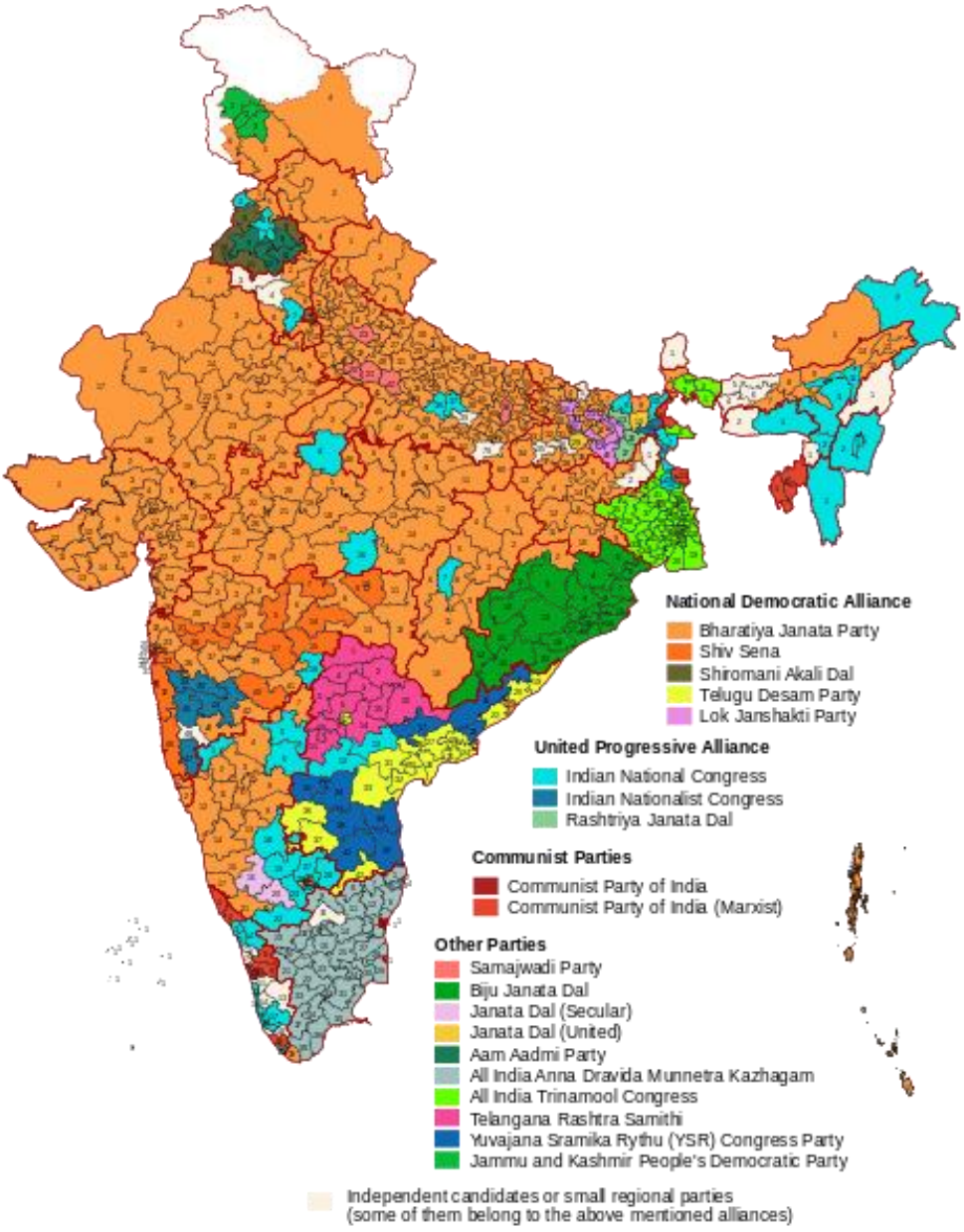
[9] Source: Election Commission of India "General Election to Lok Sabha Trends & Result 2014"

Figure 1. State-Wise Corruption Index (2005)



Source: Transparency International Survey (2005)

Figure 2. Results of the national and regional parties by alliances



Source: Election Commission of India

Under the Foreign Exchange Management Act (FEMA), foreign investment was introduced to India in 1991. The then Finance Minister was Manmohan Singh (Singh was the previous Prime Minister). In September 2012, a new FDI policy in retail was introduced. This allowed a full foreign investment in single brand retail, and 51% in multi brand retail. Besides retail, the government allows FDI in pharmaceutical industry (100%), telecommunication industry (100%), and insurance industry (49%) amongst other industries. In the *Consolidated FDI Policy* of the Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, it is written as below: *"It is the intent and objective of the Government of India to attract and promote foreign direct investment in order to supplement domestic capital, technology and skills, for accelerated economic growth. Foreign Direct Investment, as distinguished from portfolio investment, has the connotation of establishing a 'lasting interest' in an enterprise that is resident in an economy other than that of the investor."*[10]

1.5. Why region-sector-wise India is the Subject

The Republic of India (see Figure 3) is a federation consisting 29 states (the 29th state Telangana was divided from Andhra Pradesh on June 2, 2014), and each of them owns a strong autonomy. The diversification of political parties due to the rise of local parties caused political

[10] Government of India "Consolidated FDI Policy" [Chapter-1, 1.1, 1.1.1] (Effective from April 17, 2014)

decentralization of power. Therefore from 1990 onwards, the promotion of industrial policy, infrastructure development, preparation of educational facilities, etc. has been carried out by each state government. For instance in Gujarat, positive FDI policies lead to a rapid economic growth (the then State Prime Minister was the current Federal Prime Minister Narendra Modi).

Figure 3. The Political Map of India

Source: www.mapsofindia.com (2014)

There are mainly two reasons why India was chosen as the subject for this study. Firstly, India has been experiencing a rapid economic growth since the 2000s (see Figure 4). In the late 2000s, its growth rate reached 7.5%, and this doubled the average income in a decade. As the economy grew the FDI inflows have also increased rapidly (see Figure 5). In addition, a recent UNCTAD survey shows India as the second most important FDI destination after China, especially for transnational corporations from 2010 to 2012[11]. Therefore, India has been recognized as a huge market and also as a destination of FDI among the world. It is obvious that the study about FDI towards India must be done further in order to gain benefit for both the host and home investing countries. Secondly, it is necessary to analyze the Indian FDI inflows region-wise to implement an out-and-out develop of the Indian economy as a whole nation. The current FDI towards India are concentrated to some regions as shown in the table below (see Table 2). As mentioned in *1.4 Government of India FDI Policies* and the previous paragraph, India`s political status is complex due to local political parties and corruption. Therefore, the Republic of India is recently experiencing a huge social-economic transition and development. This is why it is worth studying on FDI towards India region-wise.

[11] Source: Bhavya Malhotra "Foreign Direct Investment: Impact on Indian Economy" (2014), p. 18

Figure 4. GDP per capita and GDP growth rate of India 1960-2012

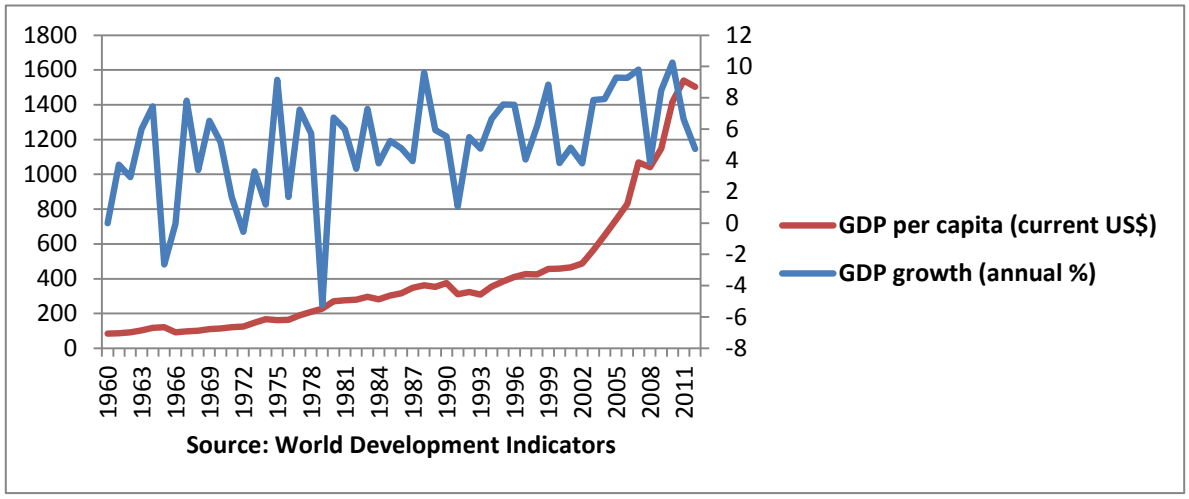


Figure 5. Foreign Direct Investment net inflows 1960-2012

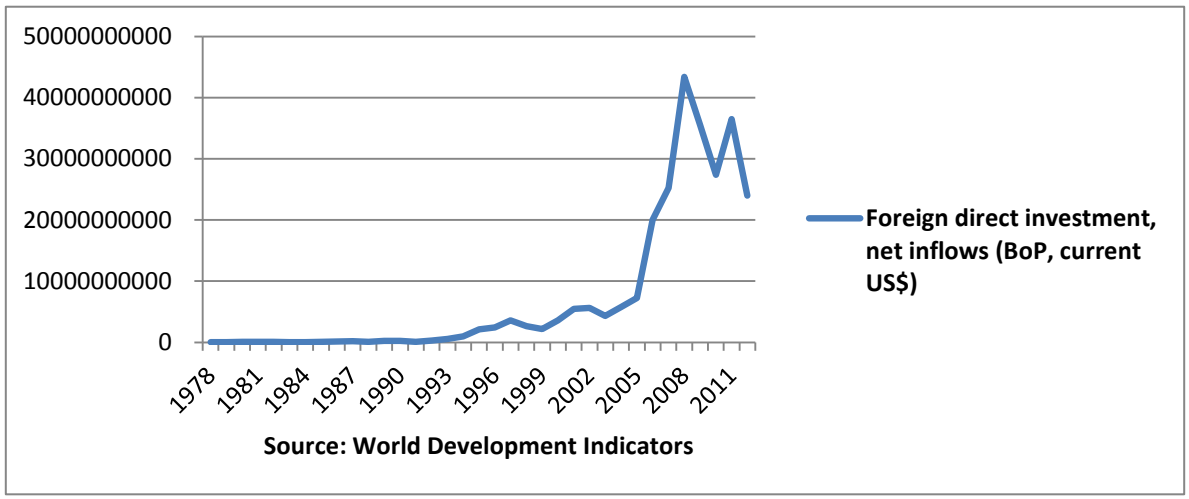


Table 2. State-wise Number of Approvals and Amount Approved of FDI August, 1991-December. 2004 (cited from "Impact of FDI in India: State-Wise Analysis in an Economic Framework" by Vani Archana, N.C.Nayak & P. Basu, 2014)

States/UTs	No. of Approvals	FDI Approved (Rs. Million)	Amt. of FDI Approved (US$. Million)
Andhra. P	1296	116344.4	3055.12
Assam	19	14.95	0.48
Bihar	49	7397.05	180.18
Gujarat	1242	124625.1	3278.24
Haryana	882	38763.08	1020.38
Himachal. P	102	12266.45	309.43
J&K	5	84.1	2.42
Karnataka	2649	190963.9	4837.22
Kerala	336	17815.42	446.69
Madhya. P	243	92714.08	2520.93
Maharashtra	5064	371077.9	9640.37
Manipur	2	31.85	0.89
Meghalaya	5	529.6	13.66
Nagaland	2	36.8	1.03
Orissa	141	82293.13	2355.78
Punjab	203	21303.54	534.98
Rajasthan	344	29112.11	782.29
Tamil Nadu	2686	226512.9	5895.99
Tripura	4	30.88	0.74
Uttar. P	815	48365.63	1307.93
West Bengal	689	77971.3	2167.03
Chhattisgarh	48	6363.03	183.33
Jharkhand	81	1465.15	42.67
Uttaranchal	52	1256.49	38.66
Arunachal. P	2	110.6	3.52
Chandigarh	86	3241.7	80.34
Delhi	2816	305226.3	8445.36
Goa	285	9993.78	251.93
Pondicherry	130	12861.53	313.74

Source: Ministry of Commerce and Industry, Government of India

1.6. Literature Review

Although the studies on FDI determinants in the context of India especially those which were analyzed state-wise are very limited, there a quite a few studies done on various regions. In this section, host countries` economic determinants of FDI in previous studies would be investigated. Most of them conclude that the main determinants are Market size (GDP), Labor cost, Infrastructure, Currency value, Gross Capital formation (gross domestic investment), country risk, inflation rate, interest rate, growth rate, trade openness rate (the percentage of exports or imports in the nation's GDP), External debt, and so on. Below are some of the major and recent studies.

Moosa (2002)[12] surveys the theories of FDI, especially variables that were not readily related to any of the theories at that time. Most of the variables investigated in this study could be included in the UNCTAD`s classification[13] of the determinants of inward FDI shown in the table below (Table 3).

[12] Imad A. Moosa "Foreign Direct Investment Theory, Evidence and Practice" (2002)

[13] UNCTAD "World Investment Report 2002 Transnational Corporations and Export Competitiveness" (2002)

Table 3. The UNCTAD`s Classification of FDI Determinants

Determining variables	Examples
Policy variables	Tax policy, trade policy, privatization policy, macroeconomic policy
Business variables	Investment incentives
Market-related economic determinants	Market size, market growth, market structure
Resource-related economic determinants	Raw materials, labor cost, technology
Efficiency-related economic determinants	Transport and communication costs, labor productivity

Source: UNCTAD (2002)

Moosa and Cardak (2006)[14] examined the determinants applying analysis to cross-sectional data on 138 countries. The results reveal three robust determinants. Exports as a percentage of GDP, telephone lines per 1000 of the population, and country risk. As a conclusion, it is stated that in developing countries with large economies, a high degree of openness and low country risk tend to be more successful that others in attracting FDI.

ÇEVIS and ÇAMURDAN (2007)[15] developed an empirical framework to estimate the economic determinants of FDI by adopting a panel data set of 17 developing countries and transition economies for

[14] Imad A. Moosa, Buly A. Cardak "The determinants of foreign direct investment: An extreme bounds analysis" (2006)

[15] Đsmail Çevis and Burak Çamurdan "The Economic Determinants of Foreign Direct Investment in Developing Countries and Transition Economies" (2007)

the period of 1989-2006. They used seven variables: the previous period FDI (the pull factor for new FDI), GDP growth (measures market size), wage (unit labor costs), trade Rate (measures the openness of countries), the real interest rates (measures macroeconomic policy), inflation rate (as country risk and macroeconomic policy), and domestic investment (business climate). In this paper it was found out that FDI of the previous period which is directly related to the hos countries` economic resources is important as an economic determinant. In addition, it revealed the main determinants are inflation rate, interest rate, growth rate, and openness rate.

Azam and Lukman (2010)[16] examined a various economic factors` effects on FDI inflows in the context of Pakistan, India, and Indonesia. The study period ranged from 1971-2005. The results revealed that market size, external debt, domestic investment, trade openness, and physical infrastructure are the important determinants of FDI. It was also concluded that the results of the determinants of India matched those of Pakistan`s, excluding trade openness and government consumption. Finally, it proposed that the management authorities of the three countries need to ensure economic and political stability, provision of infrastructure, peace and security, law and order situation, encouragement of domestic investment, curtail external debt, and equal importance be given to appropriate monetary and fiscal policy.

[16] Muhammad Azam, Ling Lukman "Determinants of Foreign Direct Investment in India, Indonesia and Pakistan: A Quantitative Approach" (2010)

Vijayakumar, Sridharan, and Rao (2010)[17] implemented an examination concentrating on the FDI towards BRICs countries using data from the period of 1975-2007. The study finds out that market size, labor cost, infrastructure, currency value and gross capital formation as the potential determinants of FDI inflows of BRICS countries. The economic stability and growth prospects (measured by inflation rate and industrial production respectively), trade openness (measured by the ratio of total trade to GDP) seemed to be the insignificant determinant of FDI inflows of the BRICS countries.

In Maggon`s (2012)[18] study, it is concluded that the boost FDI inflows significantly depend on further liberalization of its foreign investment regime.

The results of the above mentioned empirical studies on the FDI determinants are listed in the following table (Table 4).

[17] Narayanamurthy Vijayakumar, Perumal Sridharan, Kode Chandra Sekhara Rao "Determinants of FDI in BRICS Countries: A panel analysis" (2010)

[18] Mohita Maggon "Economic and Policy Determinants of Foreign Direct Investment: An Empirical Analysis in Context of India" (2012)

Table 4. The Results of the Empirical Studies on the Determinants of FDI

Empirical Studies	The Determinants of FDI
UNCTAD (2002)	Tax policy, trade policy, privatization policy, macroeconomic policy, investment incentives, market size, market growth, market structure, raw materials, labor cost, technology transport and communication costs, labor productivity.
Moosa and Cardak (2006)	Exports as a percentage of GDP, telephone lines per 1000 of the population, and country risk.
ÇEVIS and ÇAMURDAN (2007)	FDI inflows of the previous period, inflation rate, interest rate, growth rate, and openness rate.
Azam and Lukman (2010)	Market size, external debt, domestic investment, trade openness, and physical infrastructure.
Vijayakumar, Sridharan, and Rao (2010)	Market size, labor cost, infrastructure, currency value and gross capital formation.
Maggon (2012)	Liberalization of its foreign investment regime.

In this paper, the determinants of FDI towards India (data from the period 2008-2013) would be examined region-wise, using state-wise data. Sector-wise GDP would be used as a variable in order to analyze which market being the significant determinant.

2. Data

2.1. Sample States, Union Territories, and Regions

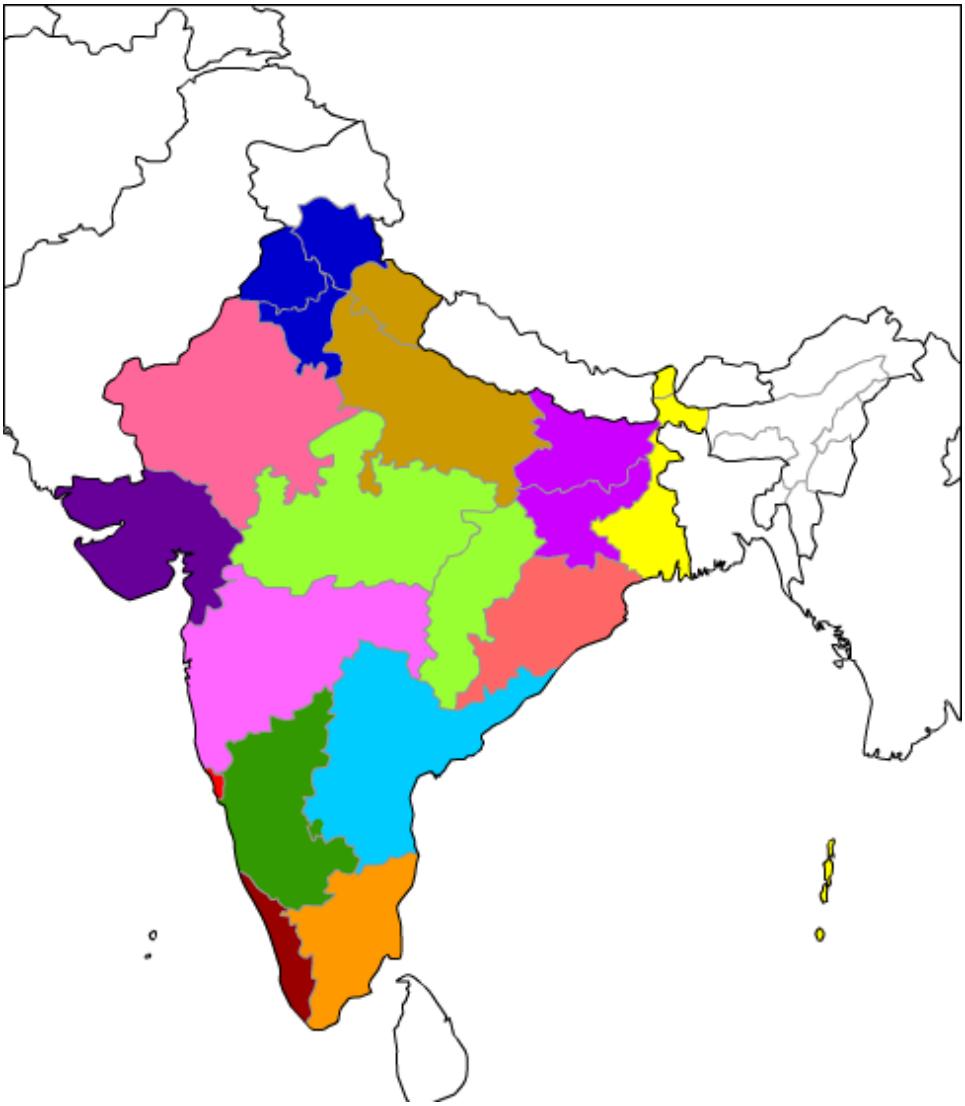
24 states and Union Territories of the Republic of India were selected. It consists Andhra Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand, West Bengal, Andaman & Nicobar Islands, Chandigarh, National Capital Territory of India (Delhi), and Pondicherry.

12 states and Union Territories were excluded due to the reasons mentioned below. The seven states of North-East India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura) were excluded due to the lack of data. Jammu & Kashmir were considered not appropriate for this study because of the continuous insecurity of the social situation. Telangana, also due to the social insecurity, but also since the state has just become independent from Andhra Pradesh in 2014, currently no data exists. In this paper, Andhra Pradesh and Telangana would be considered as a single state equally as it was until June 1, 2014. Three Union Territories (Dadra and Nagar Haveli, Daman and Diu, and Lakshadweep) were considered that they do not have a large size of economy enough to have an influence to FDI inflows.

In order to implement the analysis, 15 states and Union Territories among the selected 24 were divided into six groups as referred in the

following due to the form of FDI data compiled by the Department of Industrial Policy & Promotion, Government of India. 1.Uttar Pradesh & Uttarakhand, 2.Tamil Nadu & Pondicherry, 3.West Bengal, Sikkim, & Andaman & Nicobar Islands, 4.Madhya Pradesh & Chhattisgarh, 5.Punjab, Chandigarh, Haryana, & Himachal Pradesh, 6.Bihar & Jharkhand. Thus, there are 15 target states, Union Territories and regions as shown in the figure below. (Figure 6)

Figure 6. Geography of 15 Target States, Union Territories and Regions (National Capital Territory of India: Delhi is not shown due to the size.)



2.2. Data Description and Theory

In this study, in order to analyze the determinants of FDI in India, ten variables are included. Among them FDI is the explained variable, and the other nine are explanatory variables. The ten variables are considered as shown in Table 5.

Table 5. List of Variables

Explanatory Variable	Definition	The Direction of Expected Effect	Reasons for Inclusion
$GDP_{i(t-1)}$	GDP (current Indian Rupee in crore)	None	Indicates market size of the whole state. Generally it is considered larger markets receive more FDI.
$\mathrm{GDPPC}_{i(t-1)}$	GDP per capita (current Indian Rupee in crore)	+	Indicates citizens' affluence (living standard) and market size.
$EXPEPC_{i(t-6)}$	Expenditure on education per capita (current Indian Rupee in crore)	None	Indicates the quality of human capital. The transfer of advanced technology requires the presence of human capital.
$HL_{i(t-1)}$	Length of state and national highways (km)	+	Indicates the state capacity of FDI acceptance in the context of infrastructure development.
$HD_{i(t-1)}$	Highway density (km per 100 sq. km of land area)	+	Indicates infrastructure facilities, the ease of implementing business.
$GDPS_{i(t-1)}$	GDP of service sector (current Indian Rupee in crore)	+ (expected to have a significant effect.)	Indicates market size of the tertiary (service) sector.
$GDPM_{i(t-1)}$	GDP of mining and quarrying sector	+ or - (in resource-rich states)	Indicates market size of the mining sector.

$TEL_{i(t-1)}$	Number of telephones per 100 populations	+	Indicates infrastructure facilities, the ease of implementing business.
$NGP_{i(t-1)}$	Amount of natural gas produced (million metric standard cubic meters)	+	Indicates resource related economic determinants.
Response Variable		Definition	
FDI_{it}		FDI (current Indian Rupee in crore)	

e.g.: $GDP_{i(t-1)}$ stand for the GDP of states or Union Territory or region (here, the states that were divided in six groups) i at time t-1.

Data source

GDP: *Ministry of Statistics and Programme Implementation*

GDP per capita: *Ministry of Statistics and Programme Implementation, Ministry of Home Affairs*

Expenditure on education per capita: *Budget documents of the state governments, Ministry of Home Affairs*

Length of state and national highways: *Ministry of Road Transport & Highways*

Highway density: *Ministry of Road Transport & Highways, Ministry of Home Affairs*

GDP of service sector: *Planning Commission Government of India*

GDP of mining and quarrying sector*: Planning Commission Government of India*

Number of telephone per 100 populations: *Department of Telecommunications Ministry of Communications & Information Technology*

Amount of natural gas produced: *Ministry of Petroleum & Natural Gas Economics and Statistics Division*

FDI: *Department of Industrial Policy & Promotion Ministry of Commerce & Industry*

The used FDI data are of 2008-2013, while GDP, GDP per capita, Length of state and national highways, Highway density, GDP of service sector, GDP of mining and quarrying sector, Number of telephone per 100 populations, and Amount of natural gas produced are time lagged for minus one year, thus these data are of 2007-2012. Expenditure on education per capita are time lagged for minus six years, from 2002-2007.

3. Model and Method

The objective of this study is to reveal which factors are the significant determinants to the FDI inflow, and to figure out on which circumstances (on which states, or regions with what kind of environment) those determinants could be applied. In this paper, a multiple regression model would be used for the analysis. It is based on cross-state analysis using ordinary least square method (OLS).

Since the purpose of this study is to analyze the FDI determinants in India region and sector wisely, the states and Union Territories are grouped and analyzed in five ways mentioned below: 1.All India 2.Resource-rich states (minerals) 3.Resource-rich states (natural gas) 4.BJP administrating regions 5.State owned enterprises (SOEs) abundant regions.

3.1. Model Building

The model could be written as below.

$$FDI_{it} = a_0 + a_1 GDP_{i(t-1)} + a_2 GDPPC_{i(t-1)} + a_3 EXPEPC_{i(t-6)} + a_4 HL_{i(t-1)} + a_5 HD_{i(t-1)} + a_6 GDPS_{i(t-1)} + a_7 GDPM_{i(t-1)} + a_8 TEL_{i(t-1)} + a_9 NGP_{i(t-1)} + e_{it}$$

The model used by Moosa and Cardak (2006) is as the following.

$$FDI_i = \alpha_0 + \sum_{j=1}^{n} \alpha_j X_{ji} + \varepsilon_i$$

Where FDI_i is foreign direct investment inflow to the country i as the variable, X_{ji} the jth variable of country i. In the Moosa and Cardak (2006) model, variables such as GDP, GDP per capita, wages, trade barriers, growth rate, trade deficit exchange rate, tax rate etc… In this paper, the model includes nine explanatory economic variables. They are GDP, GDP per capita, expenditure on education per capita, length of state and national highways, highway density, GDP of service sector, GDP of mining and quarrying sector, number of telephones per 100 populations, and amount of natural gas produced (among them one variable: NGP are used only in analysis on resource-rich states <natural gas>).

In the Moosa and Cardak (2006) model, as for telecommunication infrastructure indicator telephone lines per 1000 of the population are used. In this model, the number of telephones per 100 populations would be used instead. As for another indicator of infrastructure, length of state and national highways and highway density would be used. Both GDP and GDP per capita are included not only to measure the market size, but also to indicate the individuals' living standard. Expenditure on education per capita is time lagged for minus six years since the effect of education take more time to affect the human capital economically. In order to analyze the determinants sector-wise, GDP of

service sector, GDP of mining and quarrying sector, and amount of natural gas are included as an explanatory variable.

4. Results and Analyses

The result of the regression analysis (see Appendix) shows that the coefficients are sufficed for all the analysis done among all the groups. Therefore, it could be said that the equation is appropriate and conclusive in explaining the determinants of FDI. The results show that in most cases, the variables used in this study (excluding expenditure on education per capita) could be regarded as determinants of FDI in the context of India. In the following section, the determinants would be analyzed.

4.1. Results and Analyses on Explanatory Variables

GDP: In all cases, the state's market size of the initial year showed a negative interrelation or had no correlation with the FDI. It could be concluded that in the recent years, the FDI toward India are not focusing on the whole Indian market.

GDP per capita: It showed a positive relation with the FDI excluding the rich-resourced regions which produces a huge amount of natural gas. From this result, it is revealed that in rich-resourced regions, the FDI are mainly focusing on the raw materials, rather than the market. In other states, it could be concluded that a large ratio of FDI are focused on the local market.

Expenditure on education per capita: In all cases it did not have any relation with FDI. It reveals that FDIs which transfers advanced technology only occupies a fraction of the whole FDI inflow.

Length of state and national highways: It showed a positive relation, excluding the rich-resourced region. This reveals that the capacity of developing infrastructure could be considered as a significant determinant of FDI.

Highway density: It did not show any positive effect. This result could be regarded as a result of the rapid growth of the tertiary sector, which requires few transportation infrastructures.

GDP of service sector: It showed a significant positive relation in all cases. It reveals that on all regions in India, the FDI are focused on the tertiary sector.

GDP of mining and quarrying sector: It showed a negative relation only in the region which possess natural gas, and in other regions it did not have any correlation. It is considered that this result is caused by India's unique energy environment. In many rich-resourced regions, the government owned public corporations are the dominant actors. This makes the foreign energy enterprises reluctant to advance to India.

Number of telephones per 100 populations: It showed a positive relation in most cases. This could be considered as a result of the rapid growth of the GDP per capita and the GDP of service sector.

Amount of natural gas produced: Showed a positive relation (analyzed only in rich-resourced <natural gas> region). Combined with the result of GDP of mining and quarrying sector, it reveals that many foreign enterprises focus on the resource, but does not invest directly to produce materials.

4.2. Results and Analyses on States, Union Territories, and Regions

All India analysis (see Table 6): It revealed that generally in India, the market size of the service sector in the initial year has a significant positive relation with FDI inflows. On the contrary, the whole market size of each state in the initial year has a negative relation. In addition, the highway length also had a positive relation while the highway density had a negative relation. This could be explained by the foreign enterprises' focus on the service sector since it does not require much transport infrastructure.

Table 6. All India analysis

概要								
回帰統計								
重相関 R	0.87311							
重決定 R2	0.76232							
補正 R2	0.738846							
標準誤差	6233.438							
観測数	90							
分散分析表								
	自由度	変動	分散	された分	有意 F			
回帰	8	1.01E+10	1.26E+09	32.47438	3.1E-22			
残差	81	3.15E+09	38855749					
合計	89	1.32E+10						
	係数	標準誤差	t	P-値	下限 95%	上限 95%	下限 95.0%	上限 95.0%
切片	-7971.66	2603.828	-3.06151	0.002988	-13152.5	-2790.86	-13152.5	-2790.86
GDP	-0.08188	0.009514	-8.60615	4.78E-13	-0.1008	-0.06295	-0.1008	-0.06295
GDPPC	968351	474649.8	2.040138	0.044595	23946.72	1912755	23946.72	1912755
EXPEPC	-6.6E+07	1.14E+08	-0.57819	0.56474	-2.9E+08	1.61E+08	-2.9E+08	1.61E+08
HL	0.684636	0.131923	5.189669	1.53E-06	0.422151	0.947121	0.422151	0.947121
HD	-8037.95	2411.56	-3.33309	0.001297	-12836.2	-3239.7	-12836.2	-3239.7
GDPS	0.228197	0.023999	9.508404	7.87E-15	0.180445	0.275948	0.180445	0.275948
GDPM	0.027057	0.116934	0.23139	0.817595	-0.2056	0.259718	-0.2056	0.259718
TEL	59.63302	26.20715	2.275449	0.025521	7.489017	111.777	7.489017	111.777

Resource-rich states (minerals) analysis (see Table 7): Although not as significant as other analyses, it showed a positive relation with the market size of the service sector. In addition, the irrelativeness of the market size of the mining sector and FDI inflows is notable. This could be explained by the dominance of the public corporations that are owned by the government of India as mentioned above.

Table 7. Resource-rich states (minerals) analysis

概要								
回帰統計								
重相関 R	0.904179							
重決定 R2	0.817539							
補正 R2	0.788918							
標準誤差	5603.063							
観測数	60							
分散分析表								
	自由度	*変動*	*分散*	*された分*	*有意 F*			
回帰	8	7.17E+09	8.97E+08	28.564	2.8E-16			
残差	51	1.6E+09	31394309					
合計	59	8.78E+09						
	係数	*標準誤差*	*t*	*P-値*	*下限 95%*	*上限 95%*	*下限 95.0%*	*上限 95.0%*
切片	-8177.47	5134.316	-1.59271	0.117406	-18485	2130.103	-18485	2130.103
GDP	-0.05278	0.020136	-2.62138	0.011514	-0.09321	-0.01236	-0.09321	-0.01236
GDPPC	919687.5	578333.4	1.590238	0.117962	-241365	2080740	-241365	2080740
EXPEPC	-7.5E+07	1.39E+08	-0.53693	0.593648	-3.5E+08	2.04E+08	-3.5E+08	2.04E+08
HL	0.555429	0.178456	3.112407	0.003039	0.197163	0.913695	0.197163	0.913695
HD	-2701.93	4925.482	-0.54856	0.5857	-12590.2	7186.388	-12590.2	7186.388
GDPS	0.170465	0.044727	3.811221	0.000374	0.080672	0.260259	0.080672	0.260259
GDPM	-0.03725	0.369507	-0.10081	0.920096	-0.77907	0.704566	-0.77907	0.704566
TEL	-28.5784	63.49682	-0.45008	0.654562	-156.054	98.89675	-156.054	98.89675

Resource-rich states (natural gas) analysis (see Table 8): It is remarkable that the amount of natural gas produced had a positive relation with FDI inflows. As mentioned above, it could be considered that many foreign enterprises focus on the resource.

Table 8. Resource-rich states (natural gas) analysis

概要								
回帰統計								
重相関 R	0.875855							
重決定 R2	0.767121							
補正 R2	0.662326							
標準誤差	2238.099							
観測数	30							
分散分析表								
	自由度	変動	分散	された分	有意 F			
回帰	9	3.3E+08	36667432	7.320181	0.000112			
残差	20	1E+08	5009088					
合計	29	4.3E+08						
	係数	標準誤差	t	P-値	下限 95%	上限 95%	下限 95.0%	上限 95.0%
切片	12755.51	8286.098	1.539386	0.139383	-4528.99	30040	-4528.99	30040
GDP	0.010354	0.02452	0.422286	0.677321	-0.04079	0.061502	-0.04079	0.061502
GDPPC	-4307819	1884072	-2.28644	0.033268	-8237925	-377713	-8237925	-377713
EXPEPC	1.35E+08	2.63E+08	0.513456	0.613258	-4.1E+08	6.82E+08	-4.1E+08	6.82E+08
HL	-0.29078	0.361281	-0.80485	0.430371	-1.04439	0.462841	-1.04439	0.462841
HD	-6335.9	6423.39	-0.98638	0.335731	-19734.9	7063.059	-19734.9	7063.059
GDPS	0.024512	0.042935	0.57092	0.574414	-0.06505	0.114072	-0.06505	0.114072
GDPM	-1.01678	0.568808	-1.78756	0.089012	-2.20329	0.169735	-2.20329	0.169735
TEL	257.5252	75.13689	3.427413	0.002667	100.7923	414.258	100.7923	414.258
NGP	8.823731	2.903508	3.038989	0.006481	2.767119	14.88034	2.767119	14.88034

BJP administrating regions (see Table 9): Although the highway length and the market size of the service sector showed a positive relation, it did not show other notable results. It could be concluded that further state-wise research of the relation between state parties' FDI policy and FDI inflows are required.

Table 9. BJP administrating regions

概要								
回帰統計								
重相関 R	0.762284							
重決定 R2	0.581077							
補正 R2	0.456952							
標準誤差	1762.957							
観測数	36							
分散分析表								
	自由度	変動	分散	された分	有意 F			
回帰	8	1.16E+08	14549800	4.681374	0.001118			
残差	27	83916513	3108019					
合計	35	2E+08						
	係数	標準誤差	t	P-値	下限 95%	上限 95%	下限 95.0%	上限 95.0%
切片	-1241.84	3187.715	-0.38957	0.699909	-7782.49	5298.809	-7782.49	5298.809
GDP	0.001462	0.018272	0.079987	0.936838	-0.03603	0.038953	-0.03603	0.038953
GDPPC	-190159	327099.6	-0.58135	0.565827	-861312	480993.7	-861312	480993.7
EXPEPC	-2.5E+07	67562730	-0.36504	0.717922	-1.6E+08	1.14E+08	-1.6E+08	1.14E+08
HL	0.364747	0.165072	2.20963	0.035797	0.026048	0.703446	0.026048	0.703446
HD	4290.464	2092.354	2.050544	0.050134	-2.69138	8583.618	-2.69138	8583.618
GDPS	-0.02613	0.064145	-0.40731	0.68699	-0.15774	0.105487	-0.15774	0.105487
GDPM	-0.29328	0.301933	-0.97132	0.340008	-0.91279	0.32624	-0.91279	0.32624
TEL	23.74351	35.51199	0.668605	0.509424	-49.1211	96.60811	-49.1211	96.60811

State owned enterprises (SOEs) abundant regions (see Table 10): This analysis did not have any remarkable results compared to other analyses. Further study is required on the relation between SOEs and foreign enterprises.

Table 10. State owned enterprises (SOEs) abundant regions

概要								
回帰統計								
重相関 R	0.919616							
重決定 R2	0.845693							
補正 R2	0.81826							
標準誤差	5502.25							
観測数	54							
分散分析表								
	自由度	*変動*	*分散*	*された分*	*有意 F*			
回帰	8	7.47E+09	9.33E+08	30.82824	8.3E-16			
残差	45	1.36E+09	30274754					
合計	53	8.83E+09						
	係数	*標準誤差*	*t*	*P-値*	*下限 95%*	*上限 95%*	*下限 95.0%*	*上限 95.0%*
切片	-6133.82	3654.51	-1.67843	0.100196	-13494.4	1226.737	-13494.4	1226.737
GDP	-0.07944	0.022328	-3.55774	0.000895	-0.12441	-0.03447	-0.12441	-0.03447
GDPPC	765905.3	1097211	0.698047	0.488739	-1443992	2975803	-1443992	2975803
EXPEPC	1.4E+08	2.29E+08	0.611753	0.54378	-3.2E+08	6E+08	-3.2E+08	6E+08
HL	0.824847	0.174912	4.715792	2.35E-05	0.472557	1.177137	0.472557	1.177137
HD	-12022.7	5118.663	-2.34879	0.023286	-22332.2	-1713.15	-22332.2	-1713.15
GDPS	0.216721	0.052934	4.094183	0.000174	0.110107	0.323335	0.110107	0.323335
GDPM	0.015683	0.196598	0.079771	0.936773	-0.38029	0.411652	-0.38029	0.411652
TEL	42.2738	96.38442	0.438596	0.663053	-151.854	236.402	-151.854	236.402

5. Conclusion

The purpose of this study was to examine the determinants of inward FDI in India region and sector wisely, by regression analysis. The FDI data consists of 24 state and Union Territories, in the period of 2008-2013. In the model there were nine explanatory variables. They are, respectively, GDP, GDP per capita, expenditure on education per capita, length of state and national highways, highway density, GDP of service sector, GDP of mining and quarrying sector, number of telephones per 100 populations, and amount of natural gas produced.

The results of the analysis show that generally FDI in India is related positively with GDP per capita, length of state and national highways, GDP of service sector, number of telephones per 100 populations, and amount of natural gas produced. Especially the results revealed that the FDI inflows have a significant relation with the market size of the service sector of the initial year.

6. References

Vani Archana, N.C.Nayak & P. Basu (2014), “Impact of FDI in India: State-Wise Analysis in an Economic Framework”

Ashok Kundra (2009), “India-China a Comparative Analysis of FDI Policy and Performance”

Muhammad Azam, Ling Lukman (2010), “Determinants of Foreign Direct Investment in India, Indonesia and Pakistan: A Quantitative Approach”

Đsmail Çevis and Burak Çamurdan (2007), “The Economic Determinants of Foreign Direct Investment in Developing Countries and Transition Economies”

Dipanjan Roy Chaudhury (2014), “India, Japan Sign Key Agreements; to Share ‘Special Strategic Global Partnership’” The Economic Times, September 2, 2014

Election Commission of India (2014), “General Election to Loksabha Trend and Result 2014”. 16 May 2014

Martin Feldstein (2000), “Aspects of Global Economic Integration: Outlook for the Future,” NBER Working Paper No. 7899 (Cambridge, Massachusetts: National Bureau of Economic Research)

Government of India (2014), “Consolidated FDI Policy” [Chapter-1, 1.1, 1.1.1] (Effective from April 17, 2014)

IMF (1993), “Balance of Payments Manual: Fifth Edition (BPM5)”

Jun & Brewer (1997), “The Role of Foreign Capital Flows in Sustainable Development”

JETRO (2007), “India States Abstract”

Prakash Loungani and Assaf (2001), “How Beneficial Is Foreign Direct Investment for Developing Countries? (IMF) Finance & Development” URL: http://www.imf.org/external/pubs/ft/fandd/2001/06/loungani.htm

Mohita Maggon (2012), “Economic and Policy Determinants of Foreign Direct Investment: An Empirical Analysis in Context of India”

Bhavya Malhotra (2014), “Foreign Direct Investment: Impact on Indian Economy”, p. 18

Imad A. Moosa (2002), “Foreign Direct Investment Theory, Evidence and Practice”

Imad A. Moosa, Buly A. Cardak (2006), “The Determinants of Foreign Direct Investment: An Extreme Bounds Analysis”

OECD (1996), “Detailed Benchmark Definition of Foreign Direct Investment: Third Edition (BD3)”

OECD (2001), SNA 1.128 and 2.173-2.174

OECD (2002), “Foreign Direct Investment for Development”

OECD (2008), “OECD Glossary of Statistical Terms”

K.S. Chalapati Rao, Biswajit Dhar (2011), “India`s FDI Inflows Trends” and Concepts

UNCTAD (1999), “Foreign Direct Investment”

UNCTAD (2002), “World Investment Report 2002 Transnational Corporations and Export Competitiveness”

UNCTAD (2013), “IIA Issues Note No. 3”

UNCTAD (2014), “Global Investment Trends Monitor No. 15”

Narayanamurthy Vijayakumar, Perumal Sridharan, Kode Chandra Sekhara Rao (2010), “Determinants of FDI in BRICS Countries: A panel analysis”

World Bank (2014), “Doing Business 2015 Economy Profile 2015 India”