

# Determinants of Foreign Direct Investment in India: Region-Sector-Wise Analysis

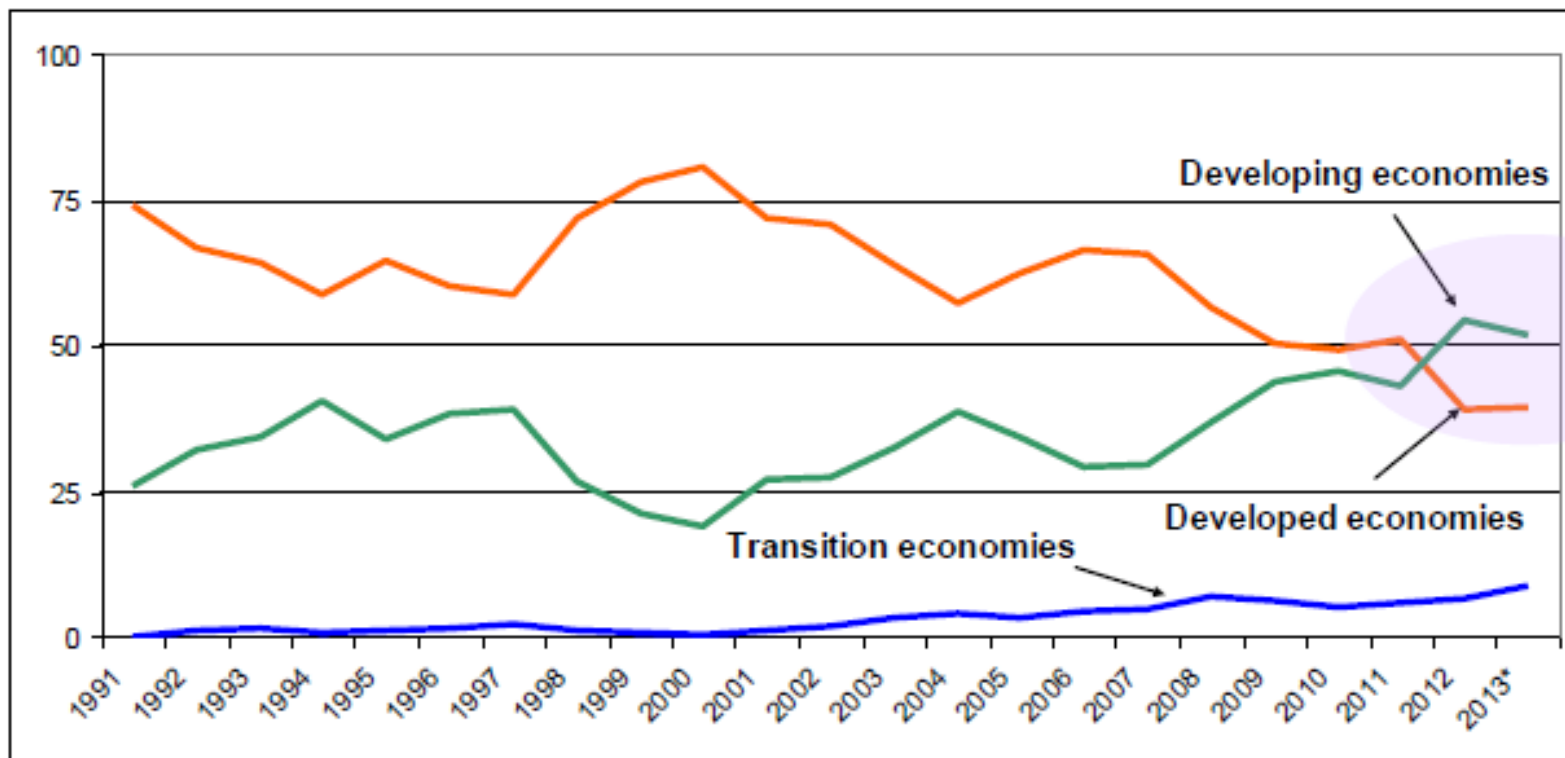
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# 1. Introduction a) Discussion on FDI

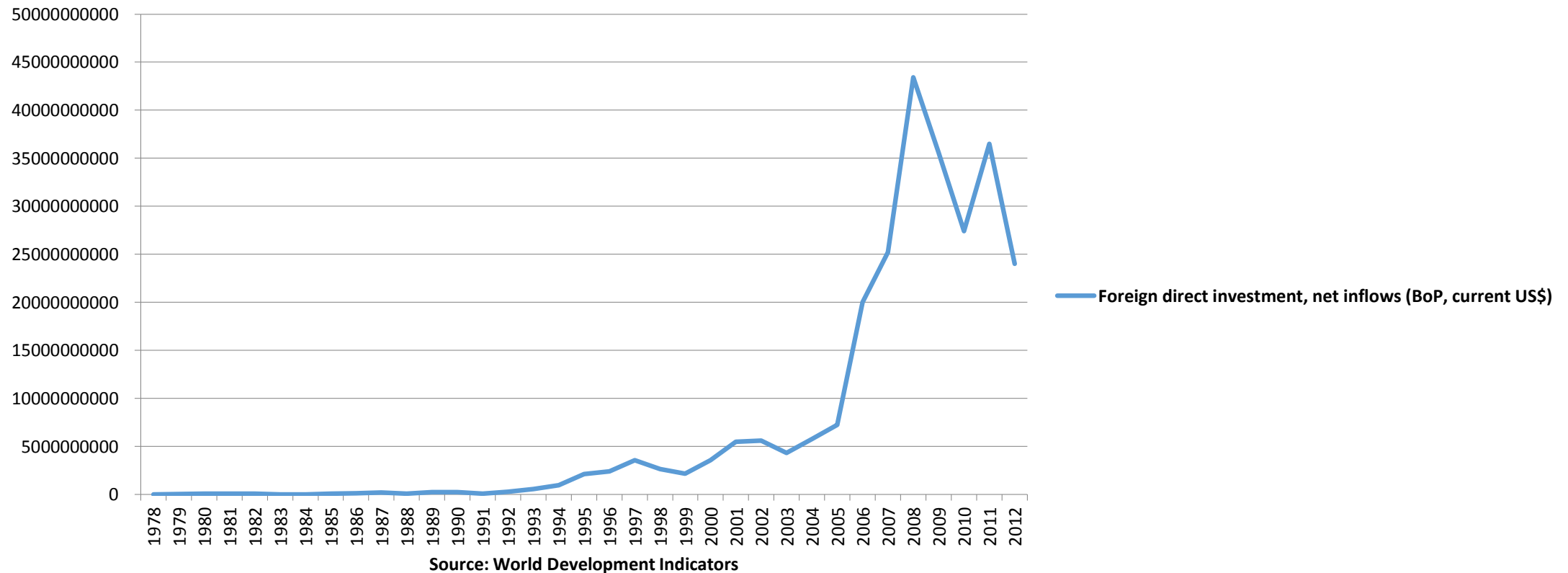
- The significant importance of FDI on economic development has been realized in recent years.



Source: UNCTAD

## b) FDI as for India

- India has been distinguished as a FDI destination in recent years as well as its rapidly growing economy.



## c) Why India Region-Sector-Wise?

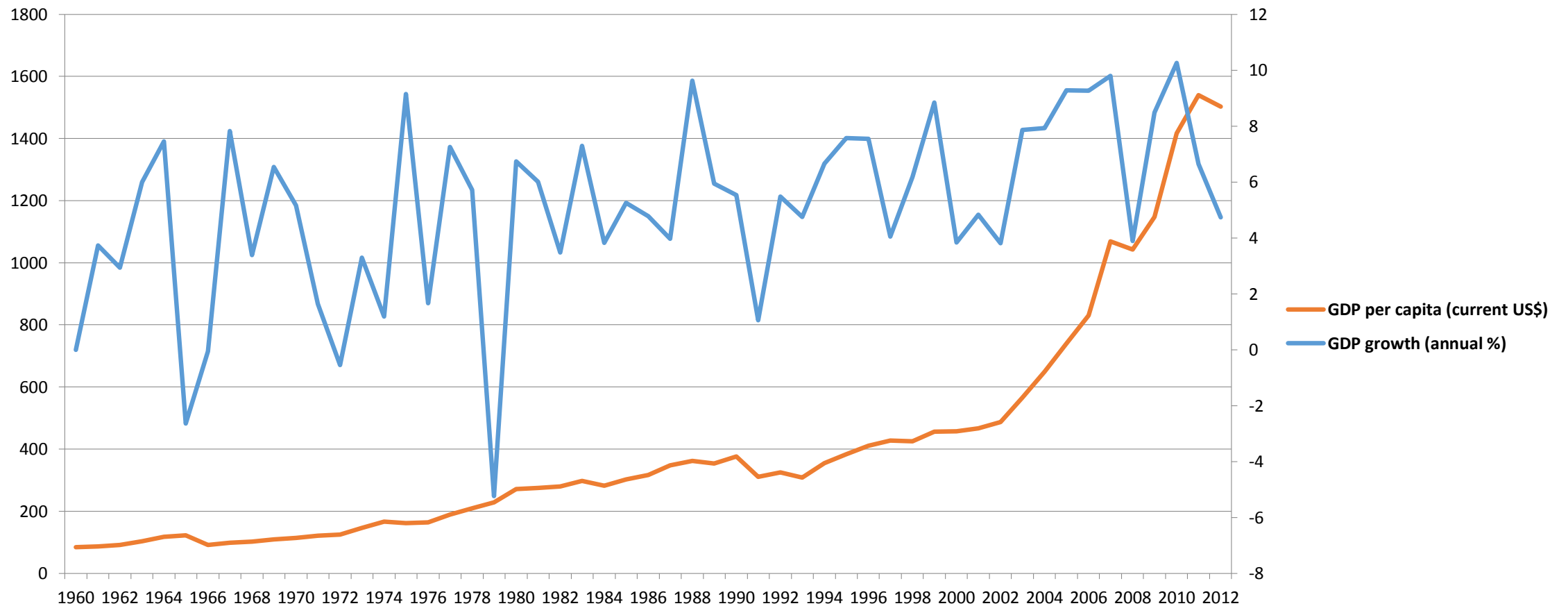
- The Republic of India
  - 29 states and 7 Union Territories.
  - Government Party: Bharatiya Janata Party
- The complexity of federalism, strong autonomy of each regions, diverse natural environment, culture, etc.



# c) Why India Region-Sector-Wise?

I. Rapidly growing market.

II. Out-and-out develop of the Indian economy as a whole nation.



Source: World Development Indicators

## 2. Previous Studies on FDI

- 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

Many studies on the determinants of FDI 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.

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Source: UNCTAD (2002)

# 3.Data Description and Theory

- Sample states: 24 states and Union Territories of the Republic of India were selected, and 12 were excluded due to the lack of data and the continuous insecurity of the social situation.
- Ten variables are uses for analysis. Among them FDI is the explained variable, and the other nine are explanatory variables (refer to the table on next slide for details).



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.
$GDPPC_{i(t-1)}$	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.
$GDP_S_{i(t-1)}$	GDP of service sector (current Indian Rupee in crore)	+(expected to have a significant effect.)	Indicates market size of the tertiary (service) sector.
$GDDPM_{i(t-1)}$	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)	

# 4. Model and Method

- The model could be written as below.

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

GDPPC: GDP per Capita

EXPEPC: Expenditure on Education per Capita

HL: Highway Length

HD: Highway Density

GDPS: GDP of Service Sector

GDPM: GDP of Mining and Quarrying Sector

TEL: Number of Telephones per 100 Populations

NGP: Natural Gas Production

# 5. Result and Analysis

- Remarkable Results
  - GDP of service sector showed a significant positive relation in all cases.
  - GDP per capita showed a positive relation excluding the rich-resourced regions which produces a huge amount of natural gas.
  - In most cases, it showed a positive relation with infrastructure (number of telephones, highway density).
  - In all cases, the state's market size of the initial year showed a negative interrelation or had no correlation with the FDI.
- Combined with the result of GDP of mining and quarrying sector, it could be considered that many foreign enterprises focus on the resource, but does not invest directly to produce raw materials.
- It is revealed that in rich-resourced regions, the FDI are mainly focusing on the resource, rather than the market. In other states, it could be concluded that a large ratio of FDI are focused on the local market.

# 5. Result and Analysis

## Result of all India analysis

概要									
回帰統計									
重相関 R	0.87310967								
重決定 R2	0.762320497								
補正 R2	0.738845978								
標準誤差	6233.437976								
観測数	90								
分散分析表									
	自由度	変動	分散	観測された分散比	有意 F				
回帰	8	10094531548	1261816443	32.47438219	3.0951E-22				
残差	81	3147315669	38855749						
合計	89	13241847217							
	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	-7971.658288	2603.828297	-3.061514578	0.002987618	-13152.45984	-2790.856737	-13152.45984	-2790.856737	
GDP	-0.081875258	0.009513579	-8.606147012	4.77535E-13	-0.100804295	-0.06294622	-0.100804295	-0.06294622	
GDPPC	968351.0032	474649.8334	2.040137666	0.044595215	23946.72129	1912755.285	23946.72129	1912755.285	
EXPEPC	-65749797.39	113716535.1	-0.578190299	0.564739722	-292010032	160510437.2	-292010032	160510437.2	
HL	0.684635583	0.131922786	5.189668909	1.52828E-06	0.422150619	0.947120547	0.422150619	0.947120547	
HD	-8037.947114	2411.559936	-3.333090335	0.00129653	-12836.19494	-3239.699291	-12836.19494	-3239.699291	
GDPS	0.228196565	0.023999461	9.50840355	7.86869E-15	0.180445164	0.275947965	0.180445164	0.275947965	
GDPM	0.027057273	0.116933564	0.23139013	0.817595254	-0.205603841	0.259718386	-0.205603841	0.259718386	
TEL	59.63301731	26.20714592	2.275448746	0.025520897	7.489017494	111.7770171	7.489017494	111.7770171	

## 6. Conclusion

The results show that 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 FDI inflows have a significant relation with the market size of the service sector of the initial year.

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# 8. Data Sources

- 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*