

# DETERMINANTS OF FDI IN INFRASTRUCTURE DEVELOPMENT IN INDIA

## A THESIS

*Submitted in partial fulfilment of the  
requirements for the award of the degree*

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*by*

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## CANDIDATE'S DECLARATION

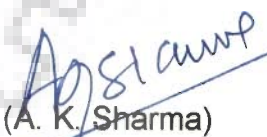
I hereby certify that the work which is being presented in the thesis entitled **DETERMINANTS OF FDI IN INFRASTRUCTURE DEVELOPMENT IN INDIA** in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy and submitted in the Department of Management Studies of the Indian Institute of Technology Roorkee, Roorkee is an authentic record of my own work carried out during the period from July 2006 to February 2010 under the supervision of Dr. Anil K. Sharma, Associate Professor, Department of Management Studies, Indian Institute of Technology Roorkee, Roorkee.

The matter presented in this thesis has not been submitted by me for the award of any other degree of this or any other institute.

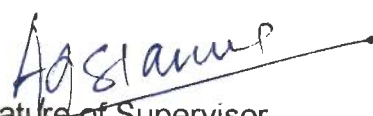
  
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Date: 26.2.2010

  
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Signature of Supervisor

  
Signature of External Examiner

## ACKNOWLEDGEMENT

When perspiration is accompanied with words, expression and unbound endeavours, a new creation comes into being: "*A pious offering to GODDESS SARASWATI complemented with dedication and devotion*".

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**Ekta Vohra**

## ABSTRACT

The state of Infrastructure provision in India is very poor. The dilapidated condition of the existing facilities and the shortfall in the required infrastructure is a major cause of resentment for the business community. In recent years, the country has realized that it is not possible for the Government alone to fund the massive needs of this sector. As an alternative approach, on the lines of many of the Latin American economies, India has gradually liberalized its policies in this sector. The intention was to commercialize the sector, which was otherwise a public good since decades and highly subsidized, with the involvement of the private developers. In order to lure the private investors, both domestic and foreign, Indian Government reformed the sector policies to provide an enabling environment for the private sector. However, this progress in private sector operation has been relatively low specifically in case of foreign participation. Discussions and debates on this subject are ongoing at the national and international forums. These deliberations among the concerned stakeholders have highlighted issues which are specific to this sector. It is important for the Government to identify the obstacles and find an amicable solution to the investor's problem, in order to have an increased private participation in infrastructure building. The case for FDI into the infrastructure development has two rationales. One, infrastructure projects require huge capital investment, and major part of the project cost has to be financed through debt. In India, domestic savings rate is very low and risk-return profile of these projects is very high, as such financial institutions are wary to invest in them. Two, these projects have long gestation period, and return on capital invested in most of the projects is likely to be realized after a specific investment period. This investment period in most of the cases ranges from 3 to 5 years, and in a few projects it may even be more than 5 years. FDI is one of the financing source in which projects do not face the risk of sudden withdrawal of funds. Also, the other positive spillover effect of the FDI is the technological advancement and skills which it brings with it.

In this thesis, the researcher has made an attempt to study the localization determinants of FDI, to understand that how India may attract FDI, and acquire capital and technology for the development of infrastructure. The variables, which the researcher has investigated through a questionnaire, are based on previous

research and studies. Factor Analysis technique is used as a tool to identify the relevant determinants of FDI inflows into the infrastructure sector in India. The general conclusions are that big market size, healthy GDP growth rate, congeniality of the relations between the Central and State Governments, dynamism and transparency in the Government offices, price-stability, tax–environment pertaining to foreign investors in infrastructure projects, applicability and effectiveness of user-charges, and dispute-resolution mechanism are significant for FDI inflows into this sector.



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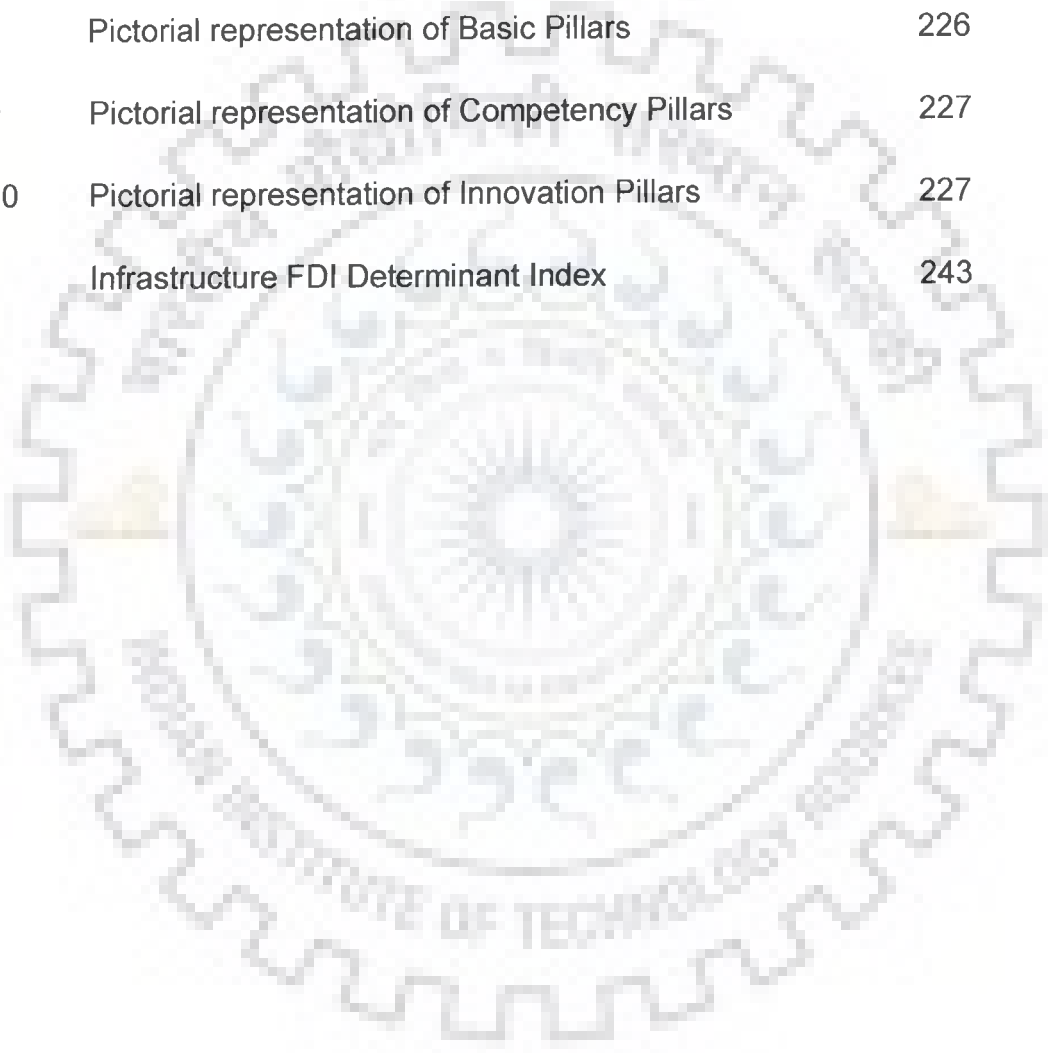
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## ABBREVIATIONS



ADB	Asian Development Bank
BITs	Bilateral Investment Treaties
BOT	Built Operate and Transfer
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CORE	Central Organisation for Railway Electrification
CRISIL	Credit Rating Information Services of India Limited
DBFO	Design Built Finance Operate
DFID	Department for International Development
DIPP	Department of Industrial Planning and Promotion
EPC	Engineering Procurement Contract
ESMAP	Energy Sector Management Assistance Programme
FDI	Foreign Direct Investment
FIAS	Foreign Investment Advisory Services
FYP	Five Year Plan
GCR	Global Competitiveness Report
GDP	Gross Domestic Product
GNP	Gross National Product
Gol	Government of India
GQ	Golden Quadrilateral
IDFC	Infrastructure Development Finance Corporation
IIFCL	India Infrastructure Finance Corporation Limited
IMF	International Monetary Fund
IPA	Investment Promotion Agencies
IPIAI	Infrastructure Private Investment Attractiveness Index
IPPs	Independent Power Producers
IR	Indian Railways
IRFC	Indian Railway Finance Corporation
JBIC	Japan Bank for International Corporation
KMO	Kaiser-Mayer-Olkin
MCA	Model Concession Agreement
MNCs	Multi National Corporations

MoP	Ministry of Power
MRVN	Mumbai Railway Vikas Nigam
NBFCs	National Banking Finance Corporations
NHAI	National Highways Authority of India
NHDP	National Highways Development Programme
NPCIL	National Power Corporation of India Limited
NTKM	Net-Tonne Kilometer
NTPCL	National Thermal Power Corporation Limited
OECD	Organisation for Economic Co-operation & Development
PC	Principal Component
PKM	Passenger Kilometer
PMGSY	Prime Minister Grameen Sadak Yojna
PPA	Power Purchase Agreement
PPI	Private Participation in Infrastructure
PPIAF	Public Private Infrastructure Advisory Services
PPP	Public Private Partnership
RBI	Reserve Bank of India
RDSO	Research Design and Standards Organisation
RKM	Route Kilometers
ROI	Return On Investment
RVNL	Rail Vikas Nigam Limited
SEBs	State Electricity Boards
SERC	State Electricity Regulatory Commission
SPC	State Power Corporation
SPV	Special Purpose Vehicle
TNCs	Trans National Corporations
UNCTAD	United Nations Co-operation for Trade and Development
UNDP	United Nations Development Programme
VGf	Viability Gap Funding
WB	World Bank
WEF	World Economic Forum
WIR	World Investment Report





# CHAPTER 1

## SECTION A: PROBLEM BACKGROUND

### 1.1 DEFINITION OF “INFRASTRUCTURE”

It is imperative here to first define Infrastructure before making any fruitful discussion on the importance of Infrastructure. Categorically, the word Infrastructure has no universally recognised definition. However, for research rationale we will consider the word “Infrastructure” as defined in Economic Survey India.

**Economic Survey India**, defines Infrastructure under the following heads:

#### a. PHYSICAL INFRASTRUCTURE

Transportation: Road, Airways and Waterways, Power, Communication.

#### b. SOCIAL INFRASTRUCTURE

Includes Water Supply, Sanitation, Sewage Disposal, Health Services, Education.

#### c. URBAN INFRASTRUCTURE

Drinking Water, Sanitation, Sewage System, Electricity and Gas Distribution, Urban Transportation, Primary Health Services and Environmental Regulations.

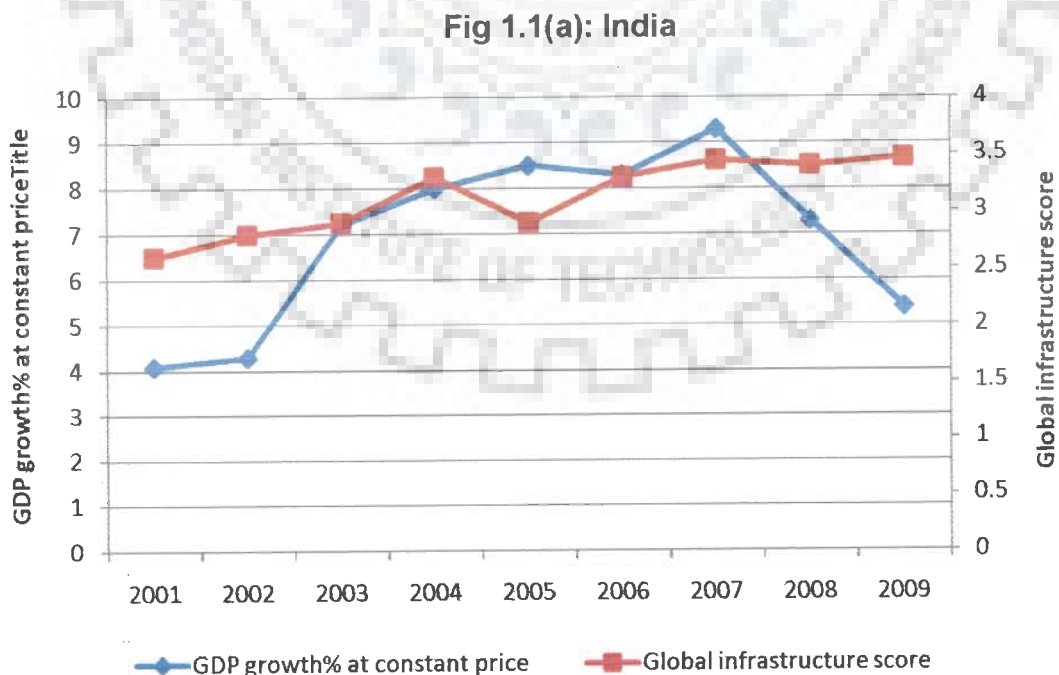
### 1.2 IMPORTANCE OF INFRASTRUCTURE DEVELOPMENT FOR ANY ECONOMY

In any nation infrastructure plays transformative role which is revealed by its impact on the overall productivity in the economy. It can be said that the 1984 study by *Blejer and Khan* [15], framed the background for inciting the research community to study the impact of public stocks (public infrastructure) and its spending on various sectors of economy. It used the cross-country data and found that public investment in infrastructure compliments private investment. However, a study on public investment conducted in the USA<sup>1</sup> [8] is fundamentally said to

have established a link between productivity growth and infrastructure availability in any economy. A study conducted on Indian economy revealed the existence of positive relationship between increased infrastructural provision and average growth rate of the Indian States [13]. Likewise, several research theories proved the existence of certain relationship between physical infrastructure and economic growth of any nation. In this context, for developing nations the creation of adequate and state of art infrastructure becomes imperative.

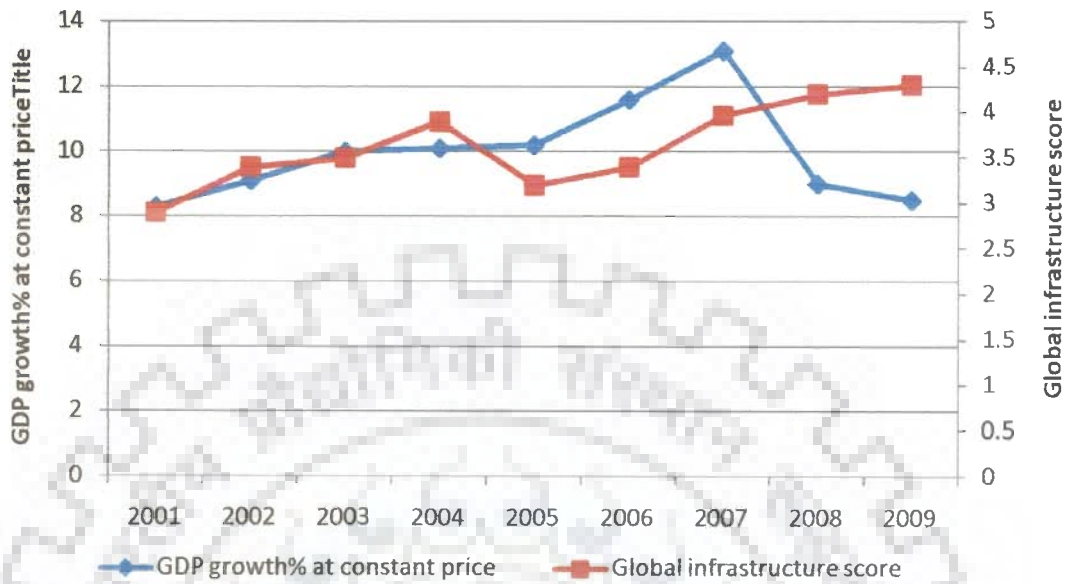
A few studies do advocate that the positive impact of increased spending on infrastructure development is visible years after and not in the same year [34] [46]<sup>2</sup>. Here it is instructive to study the correlation, if any, between the growth rate and global infrastructure scoring of few economies to further analyze the relationship between economic growth and infrastructure availability. For this purpose, five economies that include two growing economies of Asia, India and China, two growing economies of Latin America, Brazil and Mexico and a developed economy, the United States were considered [Figure 1.1]. Global Infrastructure ranking here is one as assessed by World Economic Forum (WEF) for establishing Global Competitiveness Index.

**Figure 1.1 GDP growth rate Vs. Infrastructure Score (2001-09)**



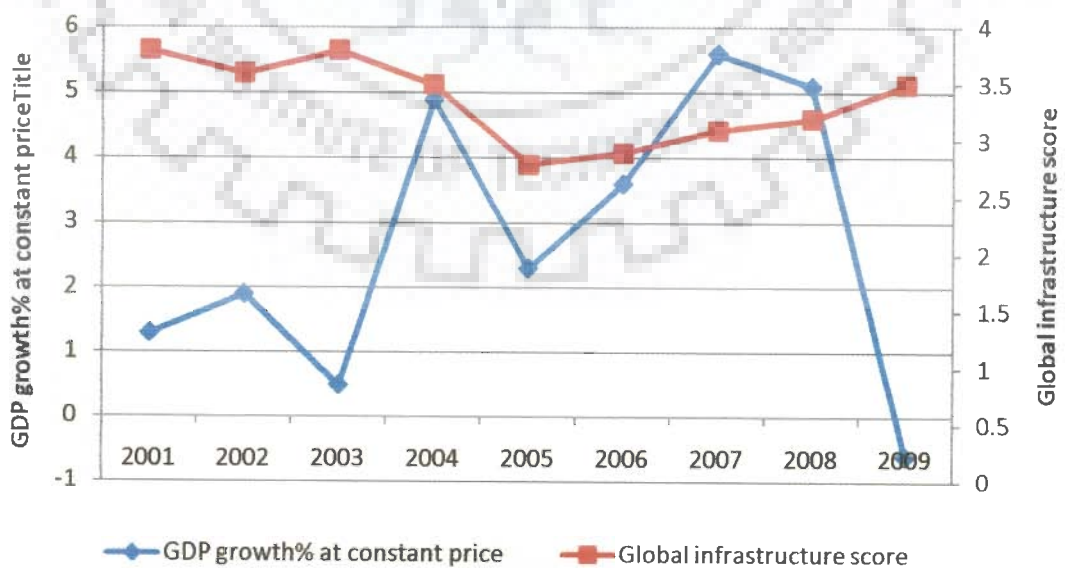
Source: GDP- International Monetary Fund (IMF) data base;  
Infrastructure score- World Economic Forum (WEF)<sup>3</sup>

Fig 1.1(b): China



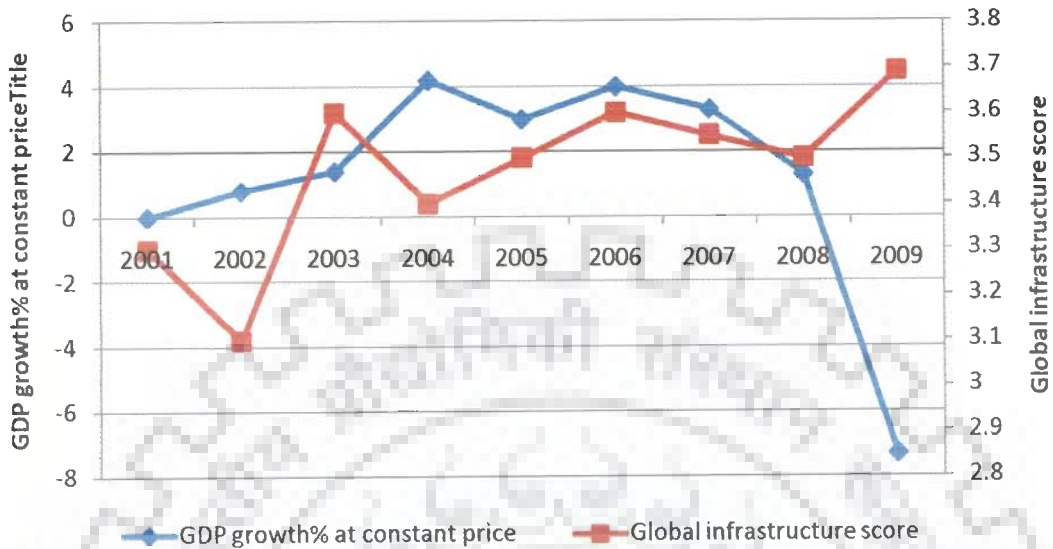
Source: GDP- IMF data base; Infrastructure score- WEF

Fig 1.1(c): Brazil



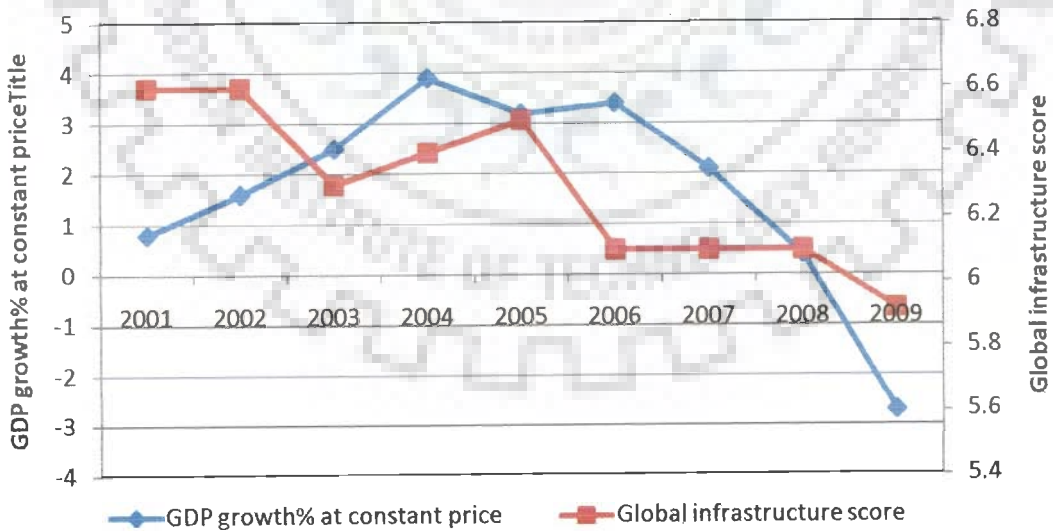
Source: GDP- IMF data base; Infrastructure score- WEF

Fig 1.1(d): Mexico



Source: GDP- IMF data base; Infrastructure score- WEF

Fig 1.1(e): U.S



Source: GDP- IMF data base; Infrastructure score- WEF

As the trend reflects, in case of India [fig 1.1(a)], China [fig 1.1(b)] and Mexico [fig 1.1(d)] the results are in line with the findings available in literature. As the score on quality and availability of infrastructure increases, the Gross

Domestic Product (GDP) growth rate follows more or less the same direction. For Brazilian economy [fig 1.1(c)] it is observed that scoring on infrastructure seems to have direct effect on economy in the following one or two years and not in the current year. This appears to be in conformity with the 2000 Organisation for Economic Cooperation and development (OECD) study by *Demetriades* [34], and 2002 study by *Esfahani and Ramierz* [46], as discussed earlier. In case of the United States [fig 1.1(e)], a developed economy for several decades, the trend for two variables goes against the findings of the literature.<sup>4</sup> However, the last two years 2008 and 2009 in observation have displayed consistency in growth rate trend for all the five economies. It is observed that growth rate has declined for all the economies and is negative for Brazil, Mexico and the US. The explanation for this common declining trend is attributed to the global financial turmoil which has jeopardized the growth of most of the world economies, India and China being the exception.

The above analysis supports this view that in any modern society, infrastructure plays a pivotal role, often decisive enough in determining the overall productivity and development of a country's economy [98]. Nevertheless, this is a qualitative and very conceptual analysis of the growth trend of two variables<sup>5</sup>. There are many other macro and micro-variables in any economy which have their implications on the growth rate. But it cannot be ignored by the research community that infrastructure does play a crucial role in the growth of any country. In this context, for developing nations the creation of adequate and state-of-art infrastructure becomes imperative. India also, being a developing economy, needs to build state of art infrastructure for augmentation of economic growth process [138].

### **1.3 INFRASTRUCTURE DEVELOPMENT IN INDIA**

#### **1.3.1 Developmental Issues**

The inception of economic liberalization in India started in the early nineties. Since then, the global trade in terms of imports and exports has increased manifold as one of the natural outcome of the liberalization process. The Government started correcting and developing the institutional policy

framework, in the initial phase of its economic commitments. The stress was to facilitate the gradual entry of Trans National Corporations (TNCs) in favorable investment environment. India gained with the entry of TNCs which accelerated the manufacturing growth and overall GDP growth rate in the succeeding years. However, this initial phase lacked in the proportionate development of additional infrastructure for new entrants, especially the six core infrastructure sectors – electricity, coal, steel, crude oil, petroleum refinery products and cement, which have a direct bearing on overall infrastructure. The repercussion of this neglect was quite visible in the late nineties and early twenties when the GDP growth rate started declining below the expected level.

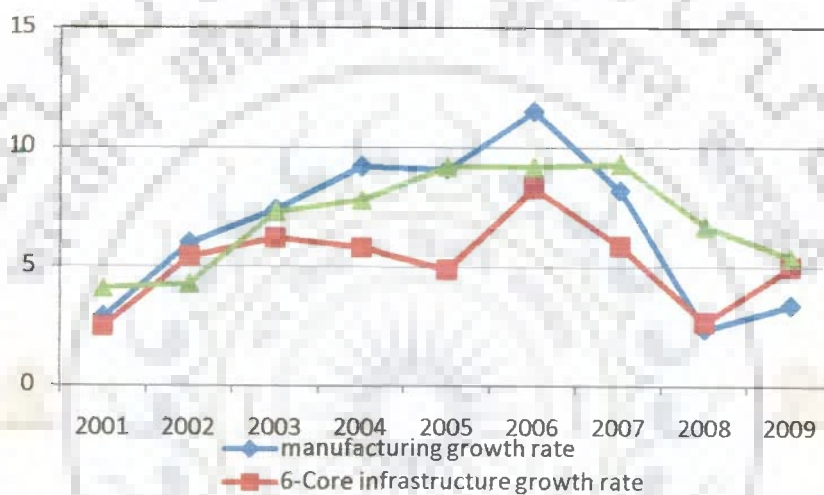
Later, in the post-reform years GDP and manufacturing growth rates witnessed tremendous rise due to the phenomenal growth in service industry and existence of liberal investment environment in the manufacturing sector, but the growth in the core infrastructure industry did not complement this growth in manufacturing sector and the GDP growth rate [Fig 1.2(a)]. The laggard performance of the 6-core infrastructure sectors reflected in the graph resulted in deterioration of existing infrastructure due to overloading on previous unplanned process, the facilities which were inadequate in quantum further declined in quality too.

In order to make the above findings appear significant, it is instructive here to pursue the study with a comparative approach. China, a growing economy has several regional and economic contexts similar to those in India. The statistical comparison with China can lead to a purposeful discussion to analyze economic growth versus infrastructure development [Figure 1.2 (b)]. It is clear from the graph that during the years 2000-2002 GDP growth rate for India staggered down from 5.3% to 4.3%, while for the same period and then onwards the growth rate of China has shown astonishing rising trend, going as high as 11% in the year 2006. However, the Indian economy picked up aggressively in the last few years with the average GDP growth of 7.6% for the tenth plan period, but it still falls short of the targeted 8% growth<sup>6</sup>. This serious decline in GDP growth rate in early twenties in India and a lesser growth rate than China, to some extent may be attributed to very low level of investment in infrastructure development in India during nineties and early twenties as indicated by Figure 1.3(a). Investment in Infrastructure

development in India as compared to China as a percentage of GDP depicts a declining trend during 1997-2002 [Figure 1.3].

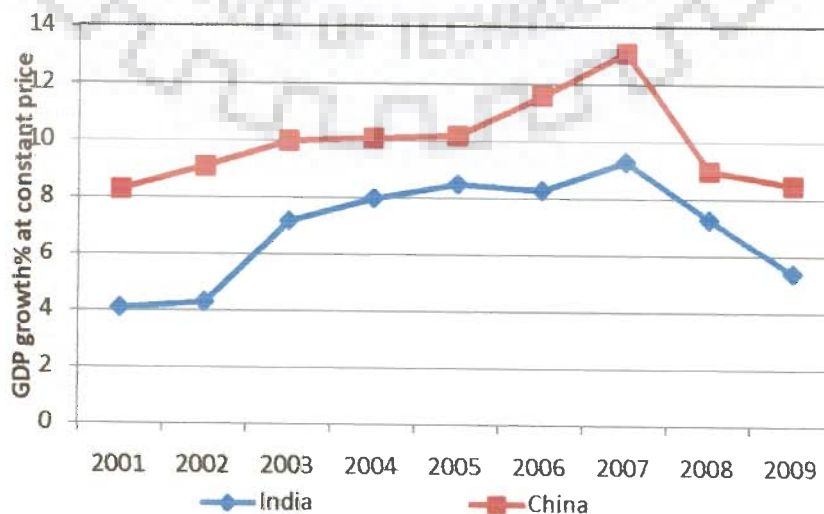
China's double digit GDP growth rate in early twenties is testimony to the fruits of rising investments in infrastructure sector, which is many times higher than that of investment in India.

**Figure 1.2 (a)**  
Growth Rate of Manufacturing, GDP and  
6-Core Infrastructure Sectors: India



Source: [www.mospi.nic.in](http://www.mospi.nic.in); Monthly Economic Report, India; Economic Survey, India (Figures for 2009 are for first two quarters of the FY).

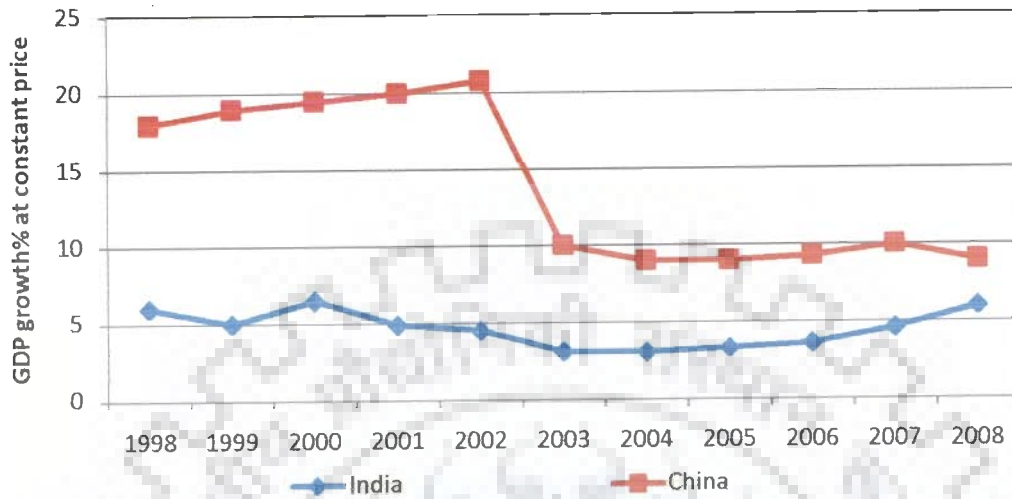
**Figure 1.2 (b)**  
GDP Growth Rate: India and China



Source: World Economic Outlook database 2009, International Monetary Fund (GDP at constant prices)



**Figure 1.3**  
**India & China: Infrastructure Investment as % of GDP**



Source: National Bureau of Statistics, China; RBI, India; Morgan Stanley Research; Planning Commission, India

India today is the fourth biggest economy in the world in terms of Purchasing Power Parity and is considered to be the only economy capable of maintaining high growth rates for the next four decades. Yet the question remains, whether the present economic growth is capable enough of facing the challenges, stroked by the poor state of infrastructure. According to Morgan Stanley, the single most serious constraint faced by Indian economy, that holds it back from achieving the desired average growth is the poor quality and inadequacy of infrastructure services – mainly, its poor quality roads, below average port's infrastructure, lack of port-connectivity roads and incessant power supply.<sup>7</sup> Moreover, infrastructure is not only about getting economic gains, it is also important for social growth. Access to clean drinking water and adequate sanitation facilities in both urban and rural areas is a fundamental requirement for any nation. India lags in creating the infrastructure to sustain and grow economic activities. India spends 4% of its GDP on infrastructure investment, compared with China's 9%<sup>8</sup>. In the year 1980 India's infrastructure stock was higher as compared to that of China, but in the last two decades China invested heavily in developing infrastructure and overtook India, and has been able to continuously widen this gap<sup>9</sup>.

In today's global economy, flow of FDI to developing nations has become one of the important sources for the required high-paced growth. Inward FDI in India is below potential as compared to that in China, and the major obstacle to foreign equity investment in India is the growing inadequacy of India's infrastructure availability [69]. India's infrastructure needs have been recognized by international investors and Indian business organization as one of the main obstacles to the country's future economic growth [4]. As of now, the infrastructure is the missing link for India. India needs sustained economic growth of double digit per annum to drastically improve its ranking in Human Development Index, HDI. To achieve this, reliable and affordable infrastructure services and redevelopment of existing infrastructure are essential requirements.

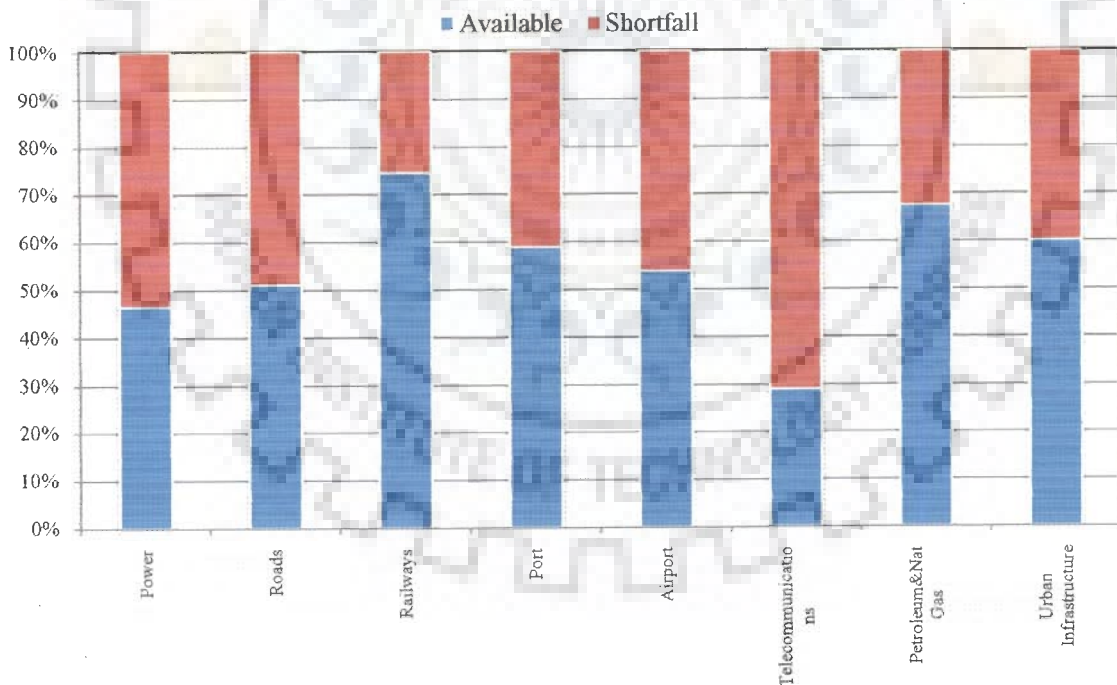
### 1.3.2 Financing Constraints

Historically, it is observed that building infrastructure provision has been the major responsibility of the public sector in almost all the major developing economies of the world including India. But owing to the rapid globalization process in the last two decades India witnessed an ever-increasing demand in the infrastructure services both in terms of available capacity and efficiency of operation. This infrastructure deficient environment – in terms of quality road network, uninterrupted high voltage power supply, state of art airport and train terminals and good inter-nodal port connectivity proved to be the major obstacles in the operation of the foreign entities in India. The major cause for this deficient environment was not the absence of political commitments but the lack of funds for developing this sector in compliance to the growing demand and in accordance with the world standards.

Infrastructure investment needs of India are enormous, and time and again it has been highlighted that the present rate of Government spending, i.e., about 4.5% of GDP annually, is not sufficient enough to cater to this growing demand. Core infrastructure sectors achieved an average growth rate of 5.9 per cent during 2007-08 as compared to 8.3 per cent in 2006-07. According to the estimates of Planning Commission, India's infrastructure financing needs for 11<sup>th</sup> Five year Plan (FYP) is US \$ 546 billion. Looking at the huge Government deficit, it is

evident that realizing this gigantic amount from the Government exchequer is not possible. It is estimated that appreciable amount of financing to the tune of US \$110 billion will have to come from private investment to ensure timely development of the required infrastructure facilities by the year 2012, Figure 1.4 provides the details of infrastructure financing needs for the 11<sup>th</sup> FYP. Public sector funding has been planned to be provided by creating Special Purpose Vehicles (SPVs) like Infrastructure Development Finance Corporation (IDFC) & India Infrastructure Finance Corporation Limited (IIFCL), and the private capital has to come in the form of debt and equity from domestic as well as from foreign sources. Foreign investment which has large potential as a lucrative source for infrastructure funding still remains to be mobilized.

**Figure 1.4: Estimated Funds Requirement & Availability for Infrastructure Projects during 2007-12**  
(Total investment requirements in all eight sectors = US \$ 546 billion)



Source: Planning Commission, Investment Commission, India

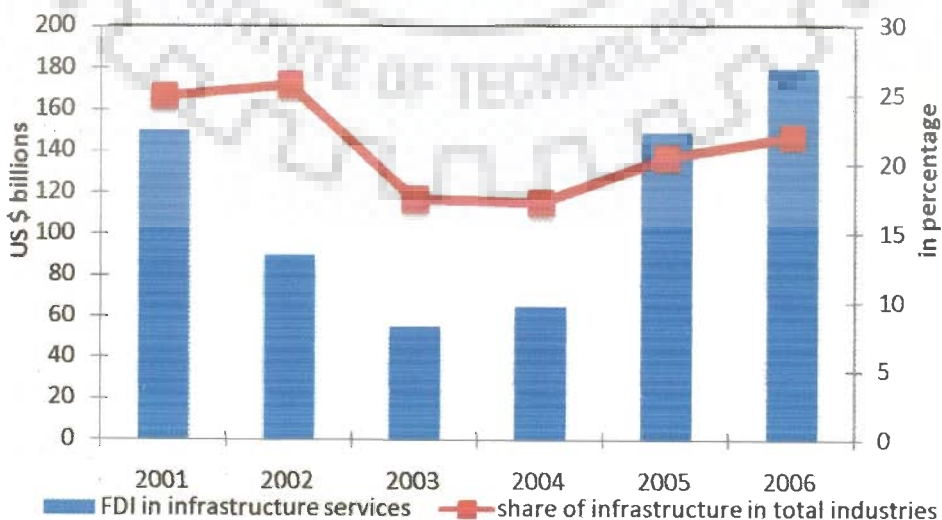
## 1.4 FDI AS AN INSTRUMENT TO FINANCE

The decade of 1990s was full of revolutionary practices for developing countries. The emerging and transition economies across the world underwent a

number of economic and institutional reforms to accommodate themselves to the liberalization phenomena that were being experienced globally. As an expected outcome of this globalization process, the countries witnessed a massive crowding in of TNCs. Multi-National Companies (MNCs) forayed into a number of sectors and the most benefited was the service sector followed by manufacturing. However, there was one more sector, the infrastructure sector that gained in a new type of investment in the form of private funding as a spillover effect of liberalization process the world over. Among the various sources of private financing and management in infrastructure facilities FDI is the primary engine in developing nations for rapidly expanding the private sector base in infrastructure development [126]. There is a long established literature on FDI, as a source of growth for developing nations. But before discussing FDI's importance, it is important to define FDI.

FDI is a transfer of capital across borders, which allows the receiving economy to increase investment beyond its own savings rate. FDI is a particularly appreciated source of capital because it has a more long-term character than portfolio investment, and direct investors make a stronger commitment to the host economy. It cannot be withdrawn quickly if country's macro environment goes through an economic downturn, such as the exchange rate crises in Mexico 1995, East Asia 1997, or Russia 1998.

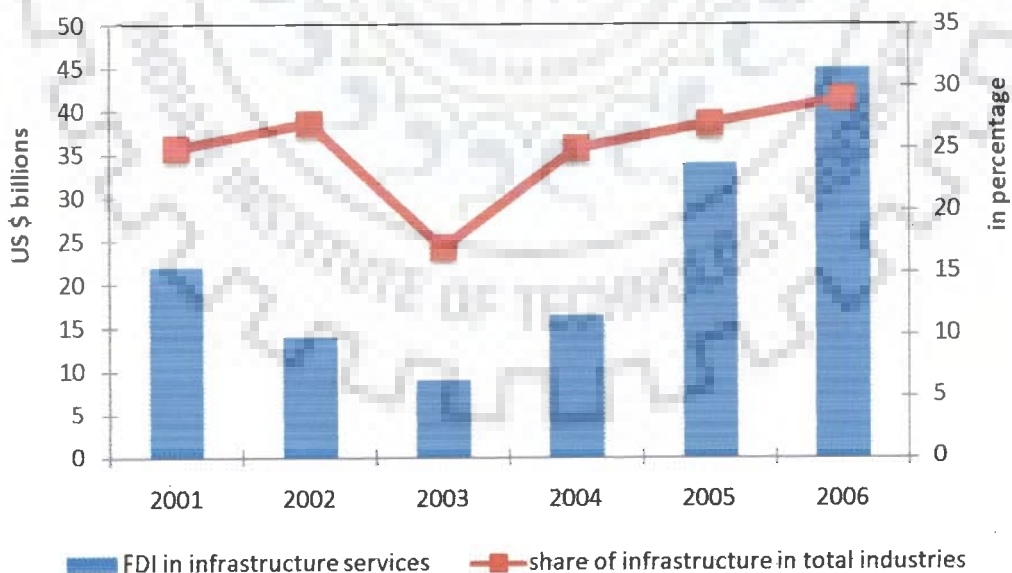
**Figure 1.5 (a): FDI in Infrastructure Services  
(Cross-border Merger & Acquisitions: Global)**



Source: World Investment Report (WIR) 2008

It is revealed by certain studies that FDI inflow can influence the development of a country's imports and exports, capital reserves, factor endowments, and terms of trade [45]. FDI can also stimulate competition in the local economy when there is a appropriate trade and active competition policies are in place [146]. In recent years FDI in infrastructure services as a group has increased both in absolute and relative terms, both Greenfield investments and Mergers and Acquisitions. In the year 2006 infrastructure related industries accounted for 22% of worldwide cross-border Merger and Acquisition<sup>10</sup> [Figure 1.5(a)], while it was just 11% for the year 1990 and as low as 3% for the year 1988. In the developing and emerging economies this trend is on a rapid rise, with almost 30% of overall cross border mergers and acquisitions happening in the infrastructure services for the year 2006 [Figure 1.5(b)].

**Figure 1.5 (b): FDI in Infrastructure Services (Cross-border Merger & Acquisitions)  
(Developing & Transition economies)**



Source: World Investment Report (WIR) 2008

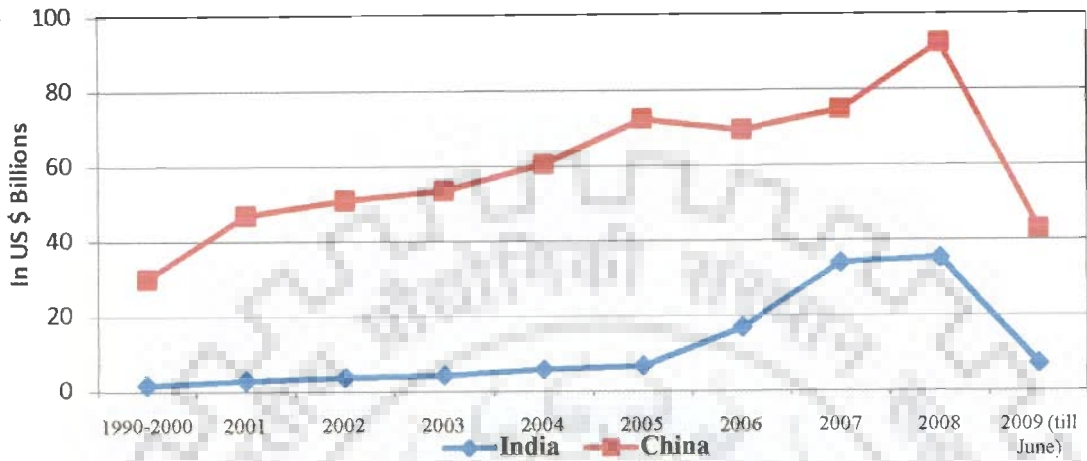
## 1.5 FDI IN INDIA: A SECTORAL ANALYSIS

Over the past two decades the world has seen an unexpected flow of capital across the borders in the form of FDI. FDI, in fact, is today one of the most contributing factors in integrating the world economy. In recent years the emerging economies, especially those of Asia, have been the focus point for the international investors, specifically India and China [Figure 1.6(a)], and the amount of FDI moving to this region has significantly increased in the last few years, amounting to about 6.62 % of global FDI in 2006<sup>11</sup>. However, India was not able to attract substantial FDI in the first few years of post-liberalization period. The major policy shift in the late 90's and early 20's has attracted the interest of foreign investors in Indian economy. Yet, India captured only \$35.2 billion of FDI in 2008, compared with China's \$92.4 billion. However, recent United Nations Co-operation for Trade and Development (UNCTAD's) "World Investment Prospects for 2011" designated India as the second most favoured "investment destination" for FDI.

FDI in infrastructure sector in India has been a recent phenomenon, especially in sectors like roads, highways, real estate, airports, ports etc. There are still some sectors remaining to receive any FDI, especially urban infrastructure, and some sectors do not have any provision for FDI, like the railways. In India the account of FDI flow into any sectors is primarily maintained by the Reserve Bank of India (RBI), which is then shared with Department of Industrial Planning and Promotion (DIPP). Till recently, there were no separate records for various sectors of infrastructure. The separate records for power and road sectors have come in existence from 2000 and 2007, respectively. Annexure 1 and Annexure 2 provide the details of FDI inflows into both the sectors.

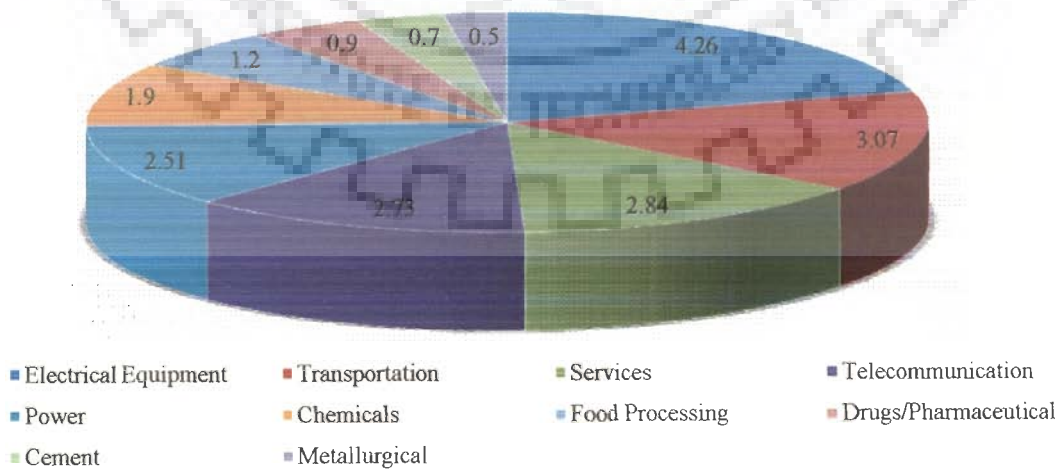
A sectoral assessment of FDI stock in India suggests that service and electrical industry account for the major FDI, and Infrastructure sector which is important for the growth and progress of any economy, take a very small share [Figure 1.6(b)]. In terms of the percentage of GDP, the FDI inflows into power, construction activities (including roads and highways) and telecommunication during 2000 to 2009 have been 4%, 6% and 8% respectively [Table 1.1].

**Figure 1.6 (a)**  
**Total FDI Inflow: India & China: 1991-2009**



Source: FDI data India – DIPP database, GoI; FDI data China – UNCTAD database on FDI

**Figure 1.6 (b)**  
**Sectoral Distribution of FDI in India (US \$ billions)**



Source: DIPP database on FDI, Government of India (GoI)

**Table 1.1: Sectoral FDI in India**

(Amount Rupees in billions; Figures in parentheses exhibit amount in billions of US \$)

<b>Sector</b>	<b><u>2006-07</u></b> <i>(April-March)</i>	<b><u>2007-08</u></b> <i>(April-March)</i>	<b><u>2008-09</u></b> <i>(April-March)</i>	<b><u>2009-10</u></b> <i>(April-May '09)</i>	<b><u>Cumulative Inflows</u></b> <i>(April '00 to May '09)</i>	<b>% age to total Inflows</b> <i>(In terms of rupees)</i>
<b>Services Sector</b> (Financial & Non-Financial)	210.47 (4.66)	265.89 (6.62)	284.11 (6.12)	53.08 (1.07)	897.61 (20.32)	23 %
<b>Computer Software &amp; Hardware</b>	117.86 (2.61)	56.23 (1.41)	73.29 (1.68)	73.3 (1.49)	402.29 (9.10)	10 %
<b>Telecommunications</b> (Radio Paging, Cellular Mobile, Basic Telephone Services)	21.55 (0.48)	51.03 (1.26)	11.71 (2.56)	3.06 (0.61)	314.22 (6.99)	8 %
<b>Housing &amp; Real Estate</b>	21.21 (0.47)	87.49 (2.18)	126.21 (2.80)	28.01 (0.57)	265.83 (6.08)	7 %
<b>Construction Activities</b> (Including Roads & Highways)	44.24 (0.99)	69.89 (1.74)	87.92 (2.03)	26.94 (0.55)	248.71 (5.74)	6 %
<b>Automobile Industry</b>	12.54 (0.28)	26.97 (0.68)	52.12 (1.15)	4.97 (0.10)	155.64 (3.49)	4 %
<b>Power</b>	7.13 (0.16)	38.75 (0.96)	43.82 (0.99)	7.77 (0.16)	147.89 (3.35)	4 %
<b>Metallurgical Industries</b>	78.66 (0.17)	46.86 (1.17)	41.57 (0.96)	1.13 (0.02)	116.18 (2.75)	3 %
<b>Petroleum &amp; Natural Gas</b>	4.01 (0.09)	57.29 (1.43)	19.31 (0.41)	8.69 (0.174)	110.46 (2.57)	3 %
<b>Chemicals</b> (Other Than Fertilizers)	9.30 (0.21)	9.20 (0.229)	34.27 (0.75)	2.47 (0.05)	98.14 (2.18)	1 %



## 1.6 CONCLUSION

Infrastructure development is characterized by long sunk cost, long gestation period and high risk portfolio. Owing to these drawbacks associated with almost every infrastructure project, it becomes difficult for the private investor to arrange the funds whose maturity matches the project completion time. FDI has numerous spill-over advantages, for it is one such financing instrument which is debt free and has no short term payment obligations. It is pertinent to mention that FDI has played an important role in rapidly expanding the private sector base in infrastructure development in emergent economies [126]. Many of the world's developing nations opened their otherwise State-protected infrastructure utilities for private sector participation. In response to their liberalization policy for this sector, these economies witnessed a sudden inflow of FDI into the infrastructure development.

Many research studies conducted on India's infrastructure deficient environment highlighted the paucity of funds as one major cause of under-developed infrastructure facilities in the country [160]. Inspired by several of these studies and other empirical findings, the Planning Commission of India emphasized the involvement of the private sector in the development and maintenance of infrastructure facilities in the country. Following this, the Government allowed the private players- both domestic and foreign, to enter the erstwhile State-owned services. This involvement of private sector is mainly in the form of – Divestiture, Greenfield Ventures, Concessionaire and Joint Ventures. Despite the fact that infrastructure investment in India offers a huge market and returns, the Latin American economies enjoy a larger share of FDI in infrastructure [10][167]. There are a number of reasons for this relatively low equity participation of foreign firms in the infrastructure development in India. Also, there is a heavy imbalance in existing FDI inflows into the various sectors of infrastructure. It is observed that the majority of investment is captured by the telecommunication, and low investment has come in the important sector of power. One important reason is the tough competition posed by the other developing economies that are also in dire need of adding capacity to their existing facilities. The other important reason is the ease of operations and direct recovery formula in sectors like telecommunication.

India is considered to be one of the economies capable of maintaining high growth rates in the next decades. But, infrastructure deficit of the country is so critical, that it could prevent India from achieving the prosperity that finally seems to be within its grasp. China spends seven times, as much as India does on infrastructure, (excluding real estate) in absolute terms. India aims to achieve double-digit growth rate in the coming years. The target cannot be achieved unless we increase our subsequent infrastructure spending steadily to about 8% of GDP. And, this is possible only through increased private sector participation.

By now, it is well established that our infrastructure needs are very broad, and policy approaches are multi dimensional in this sector. But, the country's success in involving private investment, in particular FDI, in infrastructure development, has been below potential.

## ENDNOTES

<sup>1</sup> It analyzed the data for the period 1949-85 pertaining to the United States, and found that the output elasticity of public investment in core infrastructure was 0.24, meaning thereby that a 1% increase in investment in public infrastructure would lead to a 0.24% increase in the output of the industrial sector. It was observed that a decline in productivity during the period 1971-85 in the US was largely due to a decline in public investment in infrastructure. Within a few years of Aschauer's findings, other studies were conducted to verify the results of the productive impact of public infrastructure. *Alice Munnel* [103], studied the economic impact of the non-military public and non-residential net capital stock from 1970 to 1986 in the USA. She found that States which made heavy investment in infrastructure building generated greater economic output and higher private investment, and this analysis was in line with the Aschauer's results.

<sup>2</sup> A few OECD studies [34][46] took into account the concept of "time-lag". In these studies, investments were compared with the productivity data several years afterwards, providing time gap as a cushion to accommodate the returns of infrastructure investments on the productivity figures, and reducing the chance of misrepresentation of economic growth impact as productivity impact. Both studies using this technique found that public infrastructure does have a measurable impact on increasing productivity and economic growth, although not of the magnitude as reported by Aschauer.

<sup>3</sup> Data base as accessed on 06 January, 2010 from website  
["http://www.weforum.org/pdf/Global\\_Competitiveness\\_Reports/Reports"](http://www.weforum.org/pdf/Global_Competitiveness_Reports/Reports)

<sup>4</sup> However, the *Aschauer's* study of productivity growth during the 1970's in the USA argued that the decline in productivity growth during this period was mainly due to a decline in public investment in infrastructure which is not supported by the trend shown here for recent years. Global infrastructure score is declining, but GDP consistently goes up which is contrary to the observations normally found in the existing literature. This may be the result of very huge investment made by the U.S in the past years, the benefits of which are being enjoyed by the economy in the current times. In this situation, GDP growth may not require support from the growing investment towards infrastructure development.

<sup>5</sup> This subject itself is very broad and sensitive, and has tremendous scope for future research in the light of the current global financial crisis. The findings of this kind of research can provide strong advocacy for the future policy directions for many of the developing and developed economies.

<sup>6</sup> The decline in growth rate of both the economies during 2007-09 is mainly because of global financial crisis due to which most of the economies, including developed economies like the US, have experienced the negative growth rate.

<sup>7</sup> On an average a manufacturing firm loses 8.4% of sales each year from power cuts as compared to 2% in china [168]. The greatest sufferers of inadequate infrastructure are labour- intensive small enterprises, especially in new emerging urban agglomerates. Infrastructure is also crucial to the overall economic process. A well-developed infrastructure facilitates good and efficient forward and backward linkages for manufacturing industry.

<sup>8</sup> In absolute dollar terms China spends seven times as much as India does on its infrastructure.

<sup>9</sup> For instance, Chinese spending on road sector was US \$ 1 billion in 1991 and it rose to US \$ 38 billion in 2002. This rise in spending in road sector alone boosted up China's GDP by 2% annually [60].

<sup>10</sup> Due to non-availability of data for 2007 & 2008, observations were confined to period 2000 to 2006

<sup>11</sup> World Investment Report (WIR) 2007, accessed online at

"<http://www.unctad.org/Templates/WebFlyer.asp?intItemID=4361&lang=1>" Information retrieved on 06 December, 2009.

## SECTION B - RESEARCH DESIGN

### 1.7 RATIONALE OF THE STUDY

In the present global financial turmoil India is one of the nation along with China which has been able to display good positive growth rate. This is the best evidence for being optimistic that India will be able to attain the desired double digit growth at the end of Eleventh plan period. However, as discussed in the earlier chapter, reliable and affordable infrastructure services along with the redevelopment of existing infrastructure remain the critical issue. It is also advocated by the experts and think tanks that low level of public investment in the infrastructure sector has been one major reason for India to be a laggard in this sector as compared to its peer nation China (reference to discussion in chapter 1 A). To overcome this constraint, Eleventh FYP highlights that a significant amount of infrastructure projects will have to be undertaken with private sector participation. However, the private sector can play this role, only if it has access to both domestic and international sources of funding, for both equity and debt. In today's global economy, FDI inflows into developing nations have become one of the important resources for involving private investments. India too looks positive to tap this source of funding for investment in Infrastructure sector. (A background discussion has already been made in this context in the previous section of the chapter.) But despite several reforms the country failed to appreciably attract major foreign players in the core infrastructure activities like power, highways and urban infrastructure the only exception being the telecommunication which has captured the maximum FDI in the infrastructure category.

There exist a number of positives for India to be a preferred destination for investment, like big domestic market with low penetration levels across different sectors of industry, independent judiciary, and support from multilateral organizations, regulatory institutions etc. But there are several challenges and obstacles which are active in reducing the efficiency of the capital invested. In a globalized economy, no country can afford to miss on this (FDI) instrument of financing as it is not just capital but is also an amalgamation of state of art latest technology and international management skills. An important question, therefore, with policy makers is "*what are the determinants to attract more FDI in the infrastructure building?*"

The rationale of the present study is mainly due to its relevance to the present ongoing crisis in the infrastructure building in the country as well as to inadequate success achieved in respect of the FDI as a source of financing the infrastructure building despite a two-decade long reform programme in the sector. The core issue for exploration in the present research pertains to identifying the factors (determinants) for the Indian economy which can be prioritized to gain more foreign participation in the infrastructure development.

## **1.8 SCOPE OF STUDY**

The importance of defining the scope of study lies in confining the investigations to the core issues and in maintaining a structured focus all through the study. The following constitute the broad area of investigation that constitutes the scope of study:

- 1. The investigations in the present study are limited to three core sector of infrastructure, Roads (Highways/Expressways), Power and Railways.**
- 2. The study pertains to capturing comprehensively the physical, financial and institutional status of the aforesaid infrastructure facilities in the country.**
- 3. The study analytical examines the FDI inflows into the identified sectors from the point of view of the country of origin, region of investment and annual trend. The investment pertaining to environment of the country as investigated by the development agencies is also reviewed to explore and synthesize diverse viewpoints pertaining to weaknesses and strength of the Indian investment environment with respect to those of a few other developing economies of the world.**
- 4. The study scans the present institutional, regulatory, business, macroeconomic, and financial environment pertaining to infrastructure projects in the country. It is generally observed that there is a strong link between the quality of the institutions (as indicated above) and the FDI in infrastructure in developing countries. The weakness in credibility and effectiveness of these institutes adversely affects the private investment. The study strives to find out**

**the type and extent of effect these variables have on the investment decisions.**

## 1.9 OBJECTIVES OF STUDY

The title of the present study is “***Determinants of FDI in Infrastructure Development in India***”. Apparently, the focus of the present study is to identify the factors in the Indian economy which can leverage more FDI for building the infrastructure sector in country. India’s success in involving private investment, particularly the FDI in infrastructure development has been below potential. A few research papers at the level of Asian Development Bank (ADB), World Bank (WB), United Nations Development Programme (UNDP), Department for International Development (DFID) etc. have gone into the findings, for this low response in case of developing nations. It is important to review the existing studies to understand the deterrents and determinants as identified in different countries under varying investment environment. The fact cannot be ignored that each country is exclusive in terms of its political, economic, institutional, environmental and social set up which introduce country-specific technical and operational dynamism in each sector of infrastructure. In this context, it is imperative to have an exhaustive overview of the identified sectors to develop an understanding of the existing situation. Based on this background the following have been identified as the major broad objectives of the present study:

1. To critically study the state of infrastructure in India with respect to that of a few other world economies and identify the gap in existing and required infrastructure facilities (as identified in the scope) and its probable impact on economic development.
2. To study the state of private sector participation in infrastructure development in India with main focus on the FDI and to do a cross-country assessment of the investment environment.
3. To examine the institutional, regulatory, market, financial and economic environment pertaining to foreign private investment (as well as domestic) in infrastructure building.
4. To identify the country-level pillars (determinants/factors) to leverage more FDI in infrastructure building.

5. To draw suggestive guidelines to improve the overall investment climate in the infrastructure sector in the country.

## 1.10 DATA RESEARCH AND METHODOLOGY

1. Both primary and secondary sources of data collection have been used in the present study
2. The secondary data was collected from various sources namely- on-line research database like Emerald, Science Direct, Blackwell, World Bank's Private Participation in Infrastructure (PPI) database, World Economic Forum's (WEF), Global Competitiveness Report (GCR), International Monetary Fund's (IMF) database and World Development Indicators. Apart from this published Government data, published conference compendiums and proceedings, newspapers and FDI data procured in person from the Department of Industrial Planning and Promotion, Ministry of Commerce, GoI were also referred to. The major objectives of secondary data collection were to review the existing literature studies on the subject of determinants of FDI, to capture the information on infrastructure facilities of the economies reviewed, and lastly to analyze the FDI flow pattern in India.
3. The major research findings are based on the analysis of data collected through primary survey. To collect the primary data, a well-designed questionnaire was developed and circulated among selected groups of respondents to draw a conclusion. The respondents were carefully chosen. Mainly, the target groups were those who had participated in the private infrastructure market in one way or the other – foreign infrastructure service providers, domestic infrastructure service providers that received FDI in their infrastructure projects, institutional regulators in infrastructure sector, bureaucrats in infrastructure sectors, think tanks/academicians and legal/infrastructure advisory firms.
4. An empirical assessment of the responses was done using suitable statistical tool facilitated by the SPSS software.

**The important statistical techniques used are as follows;**

**A. Descriptive:** It includes mean and standard deviation

**B. Top 2 Box and Top 2 Bottom Analysis:** While using this tool an attempt is also made to identify the percentage of response received by top 2 boxes (Strongly agree and agree) and bottom 2 boxes (Strongly disagree and disagree) in Likert Scale in the case of all the variables. The intention behind this is to identify the share of the respondents who are in agreement/disagreement with the variables stated in the questionnaire.

**C. Factor Analysis:** It is used in exploratory research to reduce the larger number of variables-set to a smaller number of factors. The main applications of factor analytic techniques are: (1) to reduce the number of variables; and (2) to detect structure in the relationships between variables, that is, to classify variables. Factor analysis is a process which examines how underlying constructs influence the responses on a number of measured variables. Factor analysis assumes that the manifest (observed) variables are linear combinations of some underlying latent (unobservable) factors. The background study of factor analysis suggested the following steps in extracting the factors or in reducing the variables. The correlation matrix for the variables is constructed to find the nature and extent of correlation between each variable. An inspection of the correlation matrix may show that there are positive relationships within some sets of variables and there may be negative ones within some. It may also point to the fact that the intensity of relationship is higher between some subsets as compared to that of the others. The next step involves extraction of the initial factor. There are a number of methods available to extract variables but out of these Principal Component Factor Analysis is usually employed. Before conducting factor extraction or reduction, it is required to carry out Kaiser-Mayer-Olkin (KMO)<sup>1</sup> and Bartlett's test of sphericity.

Once these tests are within acceptable limits, Principal Component (PC) factor analysis is done to extract smaller set of underlying factors. There are a number of methods to determine the optimal number of factors or components. The *Kaiser criterion*<sup>2</sup> states that the number of factors selected should be



equal to the number of the Eigenvalues<sup>3</sup> of the correlation matrix that are greater than one. The Scree test<sup>4</sup> states that one should plot the eigenvalues of the correlation matrix in descending order, and then use a number of factors equal to the number of eigenvalues that occur prior to the last major drop in eigenvalue magnitude or when graph tends to level off.

The factors thus obtained are rotated to obtain a factor solution that is equal to that obtained in the initial extraction, but which has the simplest interpretation<sup>5</sup>. The factor loading<sup>6</sup> on the variables is observed and factors are finally extracted. These factors identified are tested for reliability test, of being the right combination, for this Cronbach's alpha<sup>7</sup> test is conducted. The factors are then interpreted to provide the best explanation for the variables influenced by that factor. Based on the above discussion, the researcher has adopted the following methodology to identify and interpret the factors in the questionnaire study.

- SPSS software was used to conduct factor analysis. Cut-off value of 0.00001 for the determinant of correlation was taken as acceptable to carry KMO and Bartlett's test of Sphericity, necessary to carry before PC factor analysis. KMO value greater than 0.5 and Bartlett's value less than 0.05 were taken as acceptable ones.
- Eigen value = or >1 is taken as cut off for extracting the number of factors and is validated by the Scree plot. Rotated Component Matrix was drawn, using Varimax method to minimize the number of variables that have high loadings on each factor.
- Factor Loading of 0.3 or more is taken as significant cut-off value.
- Variables having a factor loading of 0.7 or more were selected<sup>8</sup>.
- Latent variables which had a factor loading of 0.5 or above on one factor and 0.3 or more on another factor were also selected.

The above methodology has been used as a guiding principle and not as a cut-off approach to overcome practical difficulties in the factor-analysis.

**D. ANOVA:** The One-Way ANOVA procedure produces a one-way analysis of variance for a quantitative dependent variable by a single factor (independent) variable. Analysis of variance (ANOVA) is used to test the hypothesis that

several means are equal. This technique is an extension of the two-sample t test. The significance level ( $p < 0.05$ ) has been taken for the analysis. It was used to confirm the applicability of the final results of the factor analysis and reliability analysis on various categories of the respondents (different categories based on profession).

### 1.11 SAMPLE SIZE

The Researcher sent the questionnaire to almost 430<sup>9</sup> people through emails, personal visits and also developed a HTML page on internet to have online-submission of questionnaire response, which is attached as Annexure. The list of the private companies operating in the road and power sector is also provided as Annexure. Since there is no private participation in operations of the railways as such no list of private firms in railways could be formed. It is evident from the analysis of the list that around 23 numbers of companies are related to private operation of roads as developers and about 83 foreign firms as equity partners<sup>10</sup>. Similarly, 43 numbers of firms are there in power sector and around 47 foreign firms as equity partners<sup>11</sup>. The Researcher sent around 189 questionnaire copies to executives in road sector, 171 executives in power<sup>12</sup> having some form of foreign private participation. To capture the view of the railways sector around 20 mails were sent to the identified project managers and deputy managers in Mumbai Railway Vikas Nigam (MRVN)<sup>13</sup>. Apart from this, the researcher identified around 60 bureaucrats, academicians/think tanks, legal and advisory firms which are working or researching in the infrastructure sector in India<sup>14</sup>. Details are provided in Table 1.2.

Three broad categories of respondents are executives and professionals from the firms operating and working in the power, roads and railways sectors respectively. Out of 430, researcher received 84 responses. The structure of these 84 respondents is provided in Table 1.3 and in Figure 1.7

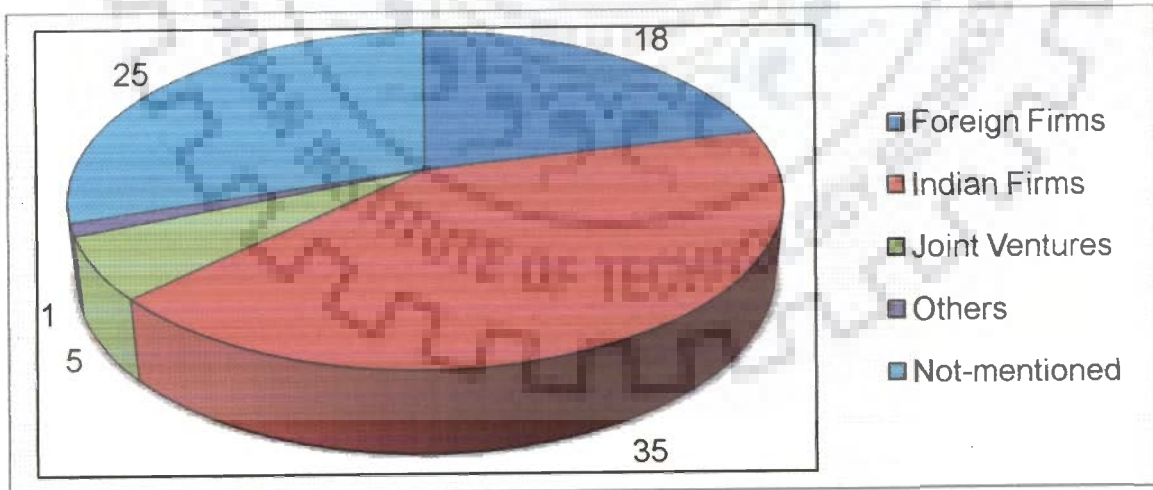
Table 1.2: Details of Questionnaires sent

1. Executives operating in Road sector	189
2. Executives operating in Power Sector	171
3. Executives operating in Railways Sector	20
4. Others (bureaucrats, legal experts, consultants)	60
<b>Total</b>	<b>430</b>

Table 1.3: Break-up of Responses Received

1. Executives operating in Road sector	29/189 (15.3%)
2. Executives operating in Power Sector	19/179 (10.6%)
3. Executives operating in Railways Sector	08/20 (40%)
4. Others (bureaucrats, legal experts, consultants and academicians)	28/60 (46.6%)
<b>Total</b>	<b>84/430 (19.5%)</b>

Figure 1.7: Firm's Profile of Respondents



Here one important consideration was that due to the shortage of foreign infrastructure operators in India, the responses were also collected from the private Indian firms which have received the FDI in their companies. Apart from this, it was realized that legal consultants, bureaucrats and academicians

associated with this sector do hold strong perception about the existing environment in India, so a fourth group was considered consisting of management and legal consultants, policy advisers in various concerned ministries and departments and academicians in reputed Indian and international institutes.

## 1.12 QUESTIONNAIRE

The focus of the study is to examine the existing macro-environment in the country pertaining to infrastructure investment so as to identify the factors that need to be prioritized at the macro and, where-ever, possible at the micro-level to fetch enhanced private funding into infrastructure building. To achieve this, the questionnaire was designed to know the views and perceptions as also to seek somewhat precise answers to following important questions

- What are the main drivers of the investment in infrastructure sector in Indian economy?
- What is the perception of the respondents with respect to the existing country level environment of investment in infrastructure sector?
- What are the investors really searching for?

In order to identify the grey areas and highlight the gaps between the existing and desired environment, the questionnaire was e-mailed and handed in person to four sets of respondents. As already mentioned earlier, the scope of this research work would be limited to three main sectors of infrastructure, namely – Power, Roads and Railways. The choice of questions was made with an intention to achieve the main objective, as described in the problem background, to give recommendations to the Indian Government regarding the factors it should highlight to attract more foreign investment in the infrastructure building. The questionnaire was designed to address the main issues that are often seen in circulation in international forums, debates, and which do form part of World Bank and Multilateral Agencies' deliberations and discussions. An attempt was made to analyze the main issues grouped under a few important and major heads, which measure the institutions, policies and factors responsible for either attracting or deterring the private investment in the sector. The choice of major heads was

based on the filtering of the determinants as narrated under the literature study. The major heads are as listed below:

- A. Macroeconomic and Market Environment** – Under this variable the attempt was made to capture the effect of various macroeconomic and market factors on the flow of FDI in the infrastructure projects in India. The main variables considered are- Inflation, exchange rate, GDP, GDP growth rate, public debt, ROI, purchasing power parity etc.
- B. Business Environment** – This section aims at examining the quality and capacity of Government agencies in interacting with the foreign firms in the case of infrastructure projects.
- C. Corruption Environment-** The variables grouped under this head aim to assess the extent of corruption prevalent in the Indian working environment and its impact on the investment decisions.
- D. Investment Environment** – The purpose of this section is to assess the overall effectiveness of the investment environment as existing in India, in creating impact on the FDI investment decisions in the infrastructure sector.
- E. Institution and Regulatory Environment-** The institutional framework that a country provides for the operation of private firms – domestic and foreign - plays an important role in shaping investment decisions. By investing this variable the quality of the existing institutional, regulatory and legal framework in the Indian infrastructure sector is assessed.
- F. Risk-related Variables** – Infrastructure projects are exposed to a variety of risks owing to its character, particularly long gestation period and heavy capital cost. By examining the nature and extent of major risks associated with the infrastructure projects in India, the attempt is to identify the main deterrents to FDI in the sector.
- G. Financial Market Environment** – The purpose of studying the financial market environment is to capture the institutional capacity of domestic capital market in attracting FDI in the infrastructure sector in India.

The survey questionnaire consisted of two major sections. Section A consisted of one question which was focused to know about the impact of broad variables, as defined in bold headings above, on the investment decision of the foreign firms. This section was not based on likert scale; therefore, no typical statistical technique was applied, only mean and standard deviation was applied to arrive at

the results. Section B of the questionnaire was based on likert scale (5-1, 5 equivalent to strongly agree and 1 equivalent to strongly disagree) where the researcher asked questions ranging from 10 to 20 under each of the 7 headings, as defined in bold headings above, to have a comprehensive feedback on the environment as prevalent in each of the questioned variable. The assessment of this section was done using factor analysis.

Making use of the inputs received from respondents, a basic conceptual analysis was done first, and then an empirical assessment was carried out applying factor analysis technique and using SPSS software. The intention of conducting basic conceptual analysis was to ascertain the category-specific perception differences in the choice of variables. Finally, using factor analysis, a set of factors were identified that substantially represented the groups that need to be prioritized to enhance India's attractiveness to private, specifically, foreign investment in infrastructure development.

### 1.13 PLAN OF STUDY

The plan of any study is a sequential outline of its broad components and provides a structured flow to the study. It is regarded as helpful for the systematic analysis of the problem, and therefore has to be carefully designed to assist in providing an orderly approach towards objective attainment. The chapter plan of the present study is designed to cover the concerns which are important for the research study and critical to the identified objectives. The whole study is comprehensively covered under six chapters. The chapter plan is as follows:

**Chapter 1 – (a) Introduction:** It provides an introductory view of the study and frames the context for the study. It highlights the importance of infrastructure for any economy and establishes the context for FDI as an instrument to finance infrastructure.

**(b) Research Design:** The chapter contains the rationale of research, scope and objectives of the research. The chapter further outlines the research methodology and discusses the evolution of questionnaire.

**Chapter 2 – Literature review:** It has been devoted to a survey of the relevant literature

**Chapter 3 – (a) Infrastructure in India:** The chapter describes the present status of physical infrastructure in India. It does discuss the existing institutional framework in each sector, and identifies the gap in infrastructure availability both in terms of physical and financial status.

**(b) FDI in India:** This part of the chapter discusses the present status of FDI in various sectors in the country. Also, efforts are made to analyse the country specific enabling environment pertaining to investment. A cross-country comparative approach is adopted in analyzing the secondary data collected in both the sections.

**Chapter 4 – through Chapter 6** is the core of the entire study. **Chapter 4** presents a cross-sectional perception analysis of the existing macro-environment pertaining to infrastructure investment in the country. This chapter is mainly based on the presentation and preliminary assessment of the responses received from the respondents. **Chapter 5**, using the sample data, attempts to 'predict' the broad country-level pillars for improving Indian investment environment to expedite infrastructure building in the country. The prediction is based on factor analysis of the sample data and reconciliation of the cross-perception of the different categories of respondents. **Chapter 6** provides the summary of the work done and concludes the research followed by recommendations for the policy-maker and Government. **Bibliography and Annexures** are exhibited at the end.

We may conclude that this research focuses to identify the factors which could be effective in accelerating the FDI inflows into the infrastructure building in India. A few research studies at the level of ADB, WB, UNDP, DFID etc. have been conducted to investigate the poor private sector participation in infrastructure facilities in the case of developing nations, but very few of them deal with country specific (India) reports, and studies focusing on particular mode of financing (FDI) are almost non-existent. It is evident that this area of research is still under-explored and is in its infancy; as such, it is expected that the findings of this study will significantly contribute to the missing literature on this subject in the context of India.

## Endnotes

<sup>1</sup> KMO is a sampling adequacy technique. It predicts if data are likely to factor well, based on correlation and partial correlation. There is a KMO statistics for each individual variable and their sum is the KMO overall statistic. KMO varies from 0 to 1.0 and KMO overall should be 0.60 or higher to proceed with factor analysis

<sup>2</sup> *Kaiser-Mayer-Olkin (KMO) criterion*: A common rule of thumb for dropping the least important factors from the analysis is the K1 rule. Though originated earlier by Guttman in 1954, the criterion is usually referenced in relation to Kaiser's 1960 work which relied upon it. The Kaiser rule is to drop all components with eigenvalues under 1.0.

<sup>3</sup> The eigenvalue for a given factor measures the variance in all the variables, which is accounted for by that factor. The ratio of eigenvalues is the ratio of explanatory importance of the factors with respect to the variables. If a factor has a low eigenvalue, then it is contributing little to the explanation of variances in the variables and may be ignored as redundant with more important factors.

<sup>4</sup> The Cattell scree test plots the components as the X axis and the corresponding eigenvalues as the Y axis. As one moves to the right, toward later components, the eigenvalues drop. When the drop ceases and the curve makes an elbow toward less steep decline, Cattell's scree test says to drop all further components after the one starting the elbow

<sup>5</sup> There are two major categories of rotations, *orthogonal rotations*, which produce uncorrelated factors, and *oblique rotations*, which produce correlated factors. The best orthogonal rotation is widely believed to be Varimax.

<sup>6</sup> The factor loadings, also called component loadings in PCA, are the correlation coefficients between the variables (rows) and factors (columns). Analogous to Pearson's  $r$ , the squared factor loading is the percent of variance in that indicator variable explained by the factor

<sup>7</sup> Cronbach's alpha is a popular method to measure reliability to test the consistency of the group or questionnaire.

<sup>8</sup> It is seen in practice that 0.7 standard is quite high, and practical data may not meet this criterion, which is why some researchers particularly for exploratory research, use a lower level such as 0.4 [122]. It is advocated that in any event factor loadings must be interpreted in the light of theory and not by arbitrary cut-off levels. Common social science practice uses a minimum cut-off of 0.3 of factor-loading. Another arbitrary rule-of-thumb terms loadings as weak if less than 0.4, and strong, if more than 0.6 and otherwise moderate.

<sup>9</sup> There are not many private infrastructure firms operating in the three sectors in India, and very few foreign firms have their involvement in the infrastructure projects in the country as equity



partners. Details of the FDI flowing into the power and road sector in the country are attached as Annexure . The researcher has also provided the list of the private operators in the country in these sectors. It needs to be noted here that no FDI has flowed into the operation of railways in the country, and there is no government policy to facilitate private operation of railways in India, presently. Due to this constraint the population size for survey was restricted and out of 430 questionnaires sent, 84 were received.

<sup>10</sup> The researcher's estimate of the number of private firms in India in road sector is based on the data as available on Public Private Partnership (PPP) database website of Gol and on the list of firms as obtained from DIPP for the monthly flow of FDI in the road sector.

<sup>11</sup> The researcher's estimate of the number of private firms in India in power sector is based on the data as available on PPP database website of Gol and on the list of firms as obtained from DIPP for the monthly flow of FDI in to the road sector.

<sup>12</sup> Due to non-availability of e-mails, phone numbers and locational problems all the firms could not be contacted.

<sup>13</sup> MRVN was selected because it is one of the wings of the Ministry of Railways in India which attempted to invite tenders for one of the freight corridor through private participation using international bidding process but failed to get optimum response (information as provided to the researcher by a responsible official in MRVN)

<sup>14</sup> The selection of academicians and think tanks was mainly based on the internet search as per the relevant literature and research studies available. The choice of Government departments was guided by information on the agencies/departments involved in the approval and implementation process in infrastructure projects.



**CHAPTER 2**

In this chapter, a detailed review of theoretical and empirical literature on the determinants of FDI is presented. A brief introduction is given to the types of FDI. This is followed by a review of the existing major theories on FDI. While reviewing the literature on the determinants of FDI, it was realized that specific studies on the determinants of FDI in infrastructure sectors were very few in number, and so, a broader category-market oriented FDI was overviewed. Also to fill the gap in the study, literature on removing barriers to private sector participation in infrastructure was analyzed to have an insight into the variables affecting private flow to this sector. The researcher also reviewed the studies on FDI determinants in relation to India. However, India-specific studies are very few in numbers, but the findings shed significant light on the country-specific variables that play important role in influencing FDI inflows to the nation.

## **2.1 TYPES OF FDI**

According to the existing literature, FDI is classified into three broad groups: Market-oriented FDI, Resource-seeking FDI or Export-oriented FDI, and Efficiency seeking FDI<sup>1</sup>.

### **2.1.1 Market-oriented FDI**

As the name suggests, it is carried on to have access to the host –country market. This type of FDI in any economy is mainly demand-driven. Market-oriented FDI is also called “Horizontal FDI” [17], as it may result in duplication of the entire production process in several countries, except for a few departments as R & D. Market oriented FDI is more responsive to the host country’s environment. In existing studies it is observed that companies take market-oriented FDI when there are substantial barriers to cross-country trades.

### **2.1.2 Resource-seeking FDI or Export-oriented FDI**

This type of FDI takes place to have access to the resources scarce in home country. Here, a part of the production chain or firm’s organization is relocated in the host country. Resource-seeking FDI may be for producing goods and services for export as well as for the domestic market.

### 2.1.3 Efficiency-seeking FDI

Efficiency-seeking FDI is conducted to take advantage of the economies of scales, clustering effect, and to minimize the production cost and, so export from the host country. In this type of FDI only part of the firm's structure is established in the foreign country and there is no need to duplicate the entire organizational structure. As such, it may also be referred to as "Vertical-FDI" [17].

The main motive of all these types of FDI is to make profit. However, different FDI types have different locational determining factors. Thus, in order to have the right attraction strategy for any sector and economy, it becomes important to understand what FDI-type an economy or sector is receiving. FDI in infrastructure development can be classified as "**Market-oriented**" because it is conducted to produce goods and services in order to serve the host-country market.

## 2.2 THEORIES OF FDI

Historically, theories of FDI have focused on finding the reasons to explain why firms invest abroad. The most visible reason behind these theories was that firms engage in transnational production to capture the global market share. There are several theories, but the scope of this study has been confined to three most influential theories of FDI propounded by

*Hymer- Management Theory 1976 [66]*

*Vernon- Product Cycle Theory 1977 [153]*

*Dunning- Eclectic Theory of International Production or OLI Paradigm –developed in 1977[38], 1979[42], 1993[40], and 2001[41].*

### 2.2.1 Hymer- Management theory

Hymer in his Ph.D dissertation highlighted that firms produce in foreign market for two major reasons. He explained that market structure and firm specific characteristics give major explanation about FDI. When a firm has certain ownership advantage over the firms in host country, which can offset the cost for being foreign in case prices drop in the sector, then the firm will invest. Secondly, when there is an imperfect host-market, i.e., entry barriers are very high, which

provide the firm an oligopoly status due to its ownership advantage. Hymer's theory was first of its kind to provide an insight different from neo-classical theories, into international investment/trade.<sup>2</sup>

### **2.2.2 Vernon- Product Cycle theory**

Vernon developed the "Product life cycle" hypothesis while explaining the increased the US MNCs activity after World War II. According to this theory, firms invest abroad during a particular stage of product life cycle. Product life cycle constitutes three main stages – Growth stage, Maturity stage and Decline stage. During the decline stage the innovation has reached its climax in the product/service life cycle in the home economy. As a result with a motive to internalize, the firms sort to extend its production or services in other countries. Vernon developed this theory in the background of the US firms undertaking FDI in other developed and developing economies. His theory was mainly based on generalization approach. He concludes that the first stage is representative of production in the US by the US companies where product innovation and flexibility are required. In the second stage, the US firms produce in other developed economies due to demand creation and to take advantage of low labour cost, while in the third stage they produce for developing economies.

### **2.2.3 Dunning- Eclectic Theory of International Production or OLI Paradigm**

Dunnings' OLI paradigm, developed in 70s, is one of the most highly regarded theories till date that explains the firms' motive of diversifying production globally. According to it, a firm's decision to produce abroad is guided by certain advantages that OLI: O- ownership, L-location and I-internalization, can offer. Two of these paradigms, O- ownership and I- internalization, are firm specific, and L- location is host country specific. This approach is used by several researchers to explain the determinants of FDI.

## **2.3 LITERATURE ON THE DETERMINANTS OF FDI**

There exists a very rich and exhaustive theoretical and empirical literature on "determinants of FDI". Conventionally, this talks about pull and push factors mainly. Determinants as identified in literature pertaining to "push" factors relates to firm- specific factors and home-country's environment, and those identified as

“pull” factors are one concerning the host country’s socio-economic-political environment. The existing literature distinguishes between firm-specific and locational factors which act as driving force behind the FDI decisions of MNCs. FDI in infrastructure sector in any economy is made with an intention to take advantage of the locational factors of the host economy. This FDI is different from export-oriented FDI, as discussed earlier (2.1), and can be categorized as market-seeking FDI. Market seeking FDI is sensitive to the sales opportunities, ease of operation in the host country and to the expected profitability from conducting business on foreign land. Therefore, the likely determinants of such a kind of FDI are locational- one which are external to firm and more associated with the macro-economic, institutional, and political and market factors of the host economy. So, the scope of the literature study for this thesis is limited to the review of location-specific advantages or pull factors of the host country as they explain the reasons behind the foreign firm’s decision to invest in particular region or location. Henceforth, researcher has restricted the search only to important empirical review related to the host-country factors. For more detailed review reference can be made to *Caves (1996)* [23]; *Blonigen (2005)* [18]; *Agarwal, (1980)* [3].

This section of the study relies primarily on literature on FDI determinants in general, as there is a lack of enough literature on determinants of FDI in infrastructure sector in particular. Also, the researcher has limited the scope of literature review to recent studies only, as most of the studies pertaining to analysis of FDI determinant in developing economies have been conducted in the last two decades. In the case of making investments in infrastructure utility sectors in foreign economy, the external factors play detrimental role. These external factors, as discussed earlier are locational and host country specific rather than firm specific. The literature review further proceeds to distinguish the FDI determinant studies pertaining exclusively to India from infrastructure studies.

### **2.3.1 Literature on locational determinants of overall FDI in an economy**

FDI strategies of MNCs are in most cases regionally specific [146]. The review of literature is organized to study individually the role of specific variables on FDI inflows, mostly in developing economies. These locational variables range from macroeconomic variables to market, political, financial, business, policy,

regulatory and institutional variables. The study is further organized with variables as subheads which discuss about the effect these variables have on the investment decisions of the MNCs.

## A. MARKET VARIABLES

The relationship between the market size of an economy and investment flowing into it is overwhelmingly defined in neoclassical domestic investment theories. A conceptual study by *Scaparlanda and Mauer (1969)* [132] was the earliest to have mentioned that the market size of an economy plays a significant positive role in attracting FDI to it, once this market size has assumed proportionately high value. *Agarwal (1980)* [3], in the review of literature on the determinants of FDI, interpreted that market size is significant for FDI which is meant for producing goods to be sold in domestic market.

However, it was the sequential studies conducted by *Dunning in 1977*[38], 1979[42], 1993[40], and 2001[41], which highlighted the phenomenon of market seeking FDI. *Dunning's (1977)* [38] study summarized that greater market size of the host economies forced a change in the internalization strategy of MNCs which shifted from export-led entry to FDI-led entry in foreign markets. However, in the case of infrastructure related services market variables assume importance in the light of the fact that production of infrastructure services is basically meant to be consumed by the domestic population.

In order to measure the effect of market variables on FDI researchers have used various attributes- GDP, GDP growth rate, GDP per capita, and in some cases Purchasing Power Parity. GDP as an instrument has been used by many to measure the attractiveness of market forces for FDI.

*Schneider and Frey (1985)* [133] conducted research to explain the FDI inflows into 80 less developed countries. They analyzed the politico-economic model for FDI determinants. One of the variables they found positively significant was real per capita GNP. *Root and Ahmed (1979)* [124] used step-wise discriminate analysis to investigate into the determinants of FDI through a sample of 41 developing countries. The authors used 44 different economic, political and social factors to search for the determinants of FDI. They found that market size of economy has significant impact on FDI inflows.

*Woodward and Rolfe (1993)* [166] used a sample of 187 firms to search for the attractive variables for FDI inflow into the Caribbean countries. The two researchers found that GDP per capita was an indicator of good infrastructure in the host country and eventually resulted in higher FDI inflow. *Nakamura and Oyama (1998)* [104] used macro-economic variables of the host countries to search for the determinants of Japanese and the US FDI inflows to 8 East Asian economies. The authors used large sample period for the study, 1979-1997 for Japan and 1982-1997 for the US FDI, and applied panel regression to analyze the data. The study summarized that FDI from Japan to two groups of East Asian countries- Singapore and Thailand, and Phillipines and Indonesia is directed to capture the local market and is positively associated to the GDP of these countries. In the case of the US, the authors found that FDI flow from the US to one group of countries, Singapore and Thailand, is significantly and positively affected by the GDP of the host countries. However, in the case of China and Malaysia, GDP of the host economies had significant impact on FDI inflow from the US, but the two were negatively linked.

*Chanderprapalert (2000)* [24] conducted study to investigate the causes of FDI to Thailand. The author used primary data and empirically tested them to identify the determinants. The result showed that one of the significant determinants of the US FDI inflow to Thailand was the market potential measured as GDP. *Galan and Benito (2001)* [51] conducted an empirical study on 103 Spanish MNCs to identify what are the factors that affect their locational choice. The study summarized that the current and future market size and its growth prospects are the key determinants of FDI location choice.

*Tseng and Zebregs (2002)* [149] used GDP per capita as a proxy for market size and found it to have a strong positive relation with FDI inflows into a country. *Vial (2002)* [154] researched for the determinants of FDI in 4 Andean countries, Bolivia, Columbia, Ecuador, and Peru. The investigations revealed that market forces, i.e. the size of the economy, as measured by the GDP, is the most important determinant of inward FDI.

*Galego et al, (2004)* [52], while investigating the reasons of inward FDI for West and East Europe countries (1994-2000), concluded that GDP per capita has positive correlation with FDI inflows. While reviewing the literature on



determinants the researcher came across a number of studies focusing on GDP and GDP growth rate as the determinants of FDI inflows into China. *Swain and Zhang (1997)* [144] studied the flow of FDI to China for the period 1978-92, and found GDP and GDP growth rate to be the strong determinants of FDI to China. *Zhang (2002)* [171], while analyzing the regional FDI inflow in China, observed that the larger the market size of the region, the greater the FDI it attracted. According, *Wei and Lieu (2001)* [157] found that the main determinant of the U.S FDI to China is the big market size of the country. *Eicher and Kang (2005)* [44] found in their studies that the size of the market is an important determinant of FDI inflow.

However, a few studies contest this conventional relation between market variable and FDI inflow. According to these studies namely *Loree and Guising, 1995* [87] and *Wei 2000* [156] the impact of the market size has varying effect on FDI inflows under different conditions. Further, *Aseidu (2002)* [9] and *Edwards (1990)* [43] find that there is no significant impact of market size or growth on FDI inflows.

## **B. MACRO-ECONOMIC VARIABLES**

A large body of literature has examined exogenous macro-economic factors of the host country that affect a firm's MNE's decision. These studies have primarily focused on exchange rates, economic stability, Return on Investment (ROI), openness, inflation and taxes.

*Scheineder and Frey, (1985)* [133] in their research study also concluded that the lower the balance of payment deficit of the Government, the greater is the FDI fetched by the country. MNCs basically produce for the domestic market and earn in local currency. Any macro-economic shock will be detrimental to the firm's rate of return [62].

*Chanderpalert (2000)* [24] in his research study established that there exists a strong negative link between exchange rate fluctuations and FDI inflow. The study observed that high fluctuations in the exchange rate of Thai currency were reflected in the decreased level the US FDI to Thailand. The East Asian financial crisis and the Latin American currency crisis of 1997 and 2001 respectively forced many foreign investors to revisit their strategies towards

investment in the service sectors in developing countries. A recent study pertaining to FDI in power sector noticed that investment in the sector declined as a whole in the developing economies following the East Asian macro-economic turmoil [64].

According to *Erdal and Tatoglu (2002)* [45], lack of exchange rate stability and economic stability has negative effect on overall FDI inflows in to Turkey during the period 1980-1999. A study conducted on transition countries found that increase in real interest rate affects FDI negatively, currency depreciation causes more FDI, and floating exchange rate favors FDI [1].

*Maniam and Chatterjee (1998)* [92] applied regression analysis to investigate into the increased flow of the US FDI to India during 1962-94. The authors concluded that relatively weak exchange rate has significant impact on FDI. *Nonnemberg and Mendonca (2004)* [105], while investigating into inward FDI in 33 developing nations, concluded that inflation and country risk rating have significant negative effect on FDI inflows.

*Nakamura and Oyama (1998)*<sup>1</sup> [104] also used macro-economic variables of the host countries. The study concluded that Japan FDI is sensitive to the Yen exchange rate in all the economies, i.e. 1% decrease in Yen exchange rate of the previous year causes an increase of 2.5% in FDI flow from Japan to Taiwan and Korea and that of 2.6% to China and Malaysia. However, in case of the US FDI, researchers concluded that the US FDI inflow to four countries- Singapore, Thailand, China and Malaysia is negatively associated to the US exchange rate, and is insignificant in the case of China and Malaysia. *Sayek Selin (1999)* [131], in the research study on inward FDI in Canada, explained the relationship between inflation and FDI inflows. He synthesized that a 3 percent increase in Canadian inflation reduced the US FDI in Canada by 2 percent.

### C. INSTITUTIONAL / REGULATORY VARIABLES

The quality of domestic institutions has been given a prominent position in the development economic theories. In the light of growing liberalization policies of developing and transition economies this relationship between good domestic

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<sup>1</sup> Study already mentioned while discussing about the market variables

institutions and FDI inflows is very much highlighted by the global community. A number of studies have been conducted in recent past using good governance, corruption and quality of regulatory institutions and legal infrastructure as measure of good institutions. However, the relationship between corruption and FDI inflows is explored separately.

According to a study conducted by the *United Nations (1999)* [152], policy initiatives taken by Governments to liberalize the investment environment has fetched them a greater level of FDI. The study summarized that in the year 1998; about 60 countries across the world underwent 145 regulatory changes. Out of these 94 percent created more favorable environment for foreign investment. *Daude and Stein (2001)* [30] used database on bilateral FDI flows between 18 source countries and 58 host countries to search for FDI determinants. The study concluded that the quality of good Government institutions have significant impact on inward FDI. An increase in one standard deviation in the quality of institutions leads to an increase of 158% in FDI. *Globerman et al (2005)* [54] found good governance and institutions to have positive impact on FDI, while investigating into the determinants of FDI for 20 emerging and transition economies in Europe.

A study conducted by *Quere (2005)* [117] emphasized the role of good institutions in attracting FDI to an economy. *Quere et al (2007)* [118] studied for the influence of institutions on the bilateral flow of FDI in OECD countries. The results highlighted that good institutions increase the prospects of inward FDI, while they do not have significant effect on outward FDI.

*Ali et al (2008)* [5] analyzed the impact of institutions on the flow of FDI to 107 economies for the period 1981-2005. The authors applied panel data analysis and found that the institutions are the robust positive determinants of FDI. They also concluded that rule of law, expropriation risk and propriety rights are the main institutional variables that play a vital role in attracting FDI. *Trevino et al (2004)* [148] conducted a FDI study on 7 Latin American economies for the period 1988-1999 and found that institutional reforms and higher level of privatization in Latin American economies attracted more FDI in the region.

*Pargal (2003)* [108] established that the countries which adopt regulations that are pro-liberalization attract more private investment. The author also mentioned that the established legal framework to facilitate reforms is an

important determinant of foreign investment. *Kral (2004)* [78] conducted a study on Czech Republic and concluded that efficient public governance and regulatory framework are significant determinants of FDI. Certain studies have highlighted that the legal-contractual framework for emerging market's infrastructure investment has an important bearing on the investment decision [107]. *Saskia et al (1998)* [129] analyzed the determinants of FDI for 67 emerging economies. The empirical results disclosed that strong Government institutions are the most significant determinants of FDI. The institutions addressed are the rule of law and the administrative and legal structure in terms of transparency and accountability.

In attracting FDI the main objective of economies is to leverage foreign savings and funds for boosting economic development. However, MNCs, while investing in any economy, do also search for strong and developed financial and capital markets [67]. The aim is to avail of domestic debt from the local financial market, as infrastructure projects involve heavy capital investment.

#### **D. POLICY INCENTIVES**

In the last few decades it is observed that developing economies have come up with various policy measures in the form of investment incentives to attract FDI. This initiation on the part of host economies has gathered a lot of attention from academicians and researchers to investigate into the relation between increased incentives and inward FDI [14] [21] [113]. Investment policies or incentives take a variety of forms, and they range from tax concession, holidays, tax deduction, import duty relaxations and RoI.

*Guisinger et al (1985)* [56] searched for the impact of incentive schemes offered by the host countries to foreign investors. He studied a sample of 20 developed and developing countries and surveyed 74 investors operating in these countries. The author summarized that in case incentives related to investment are withdrawn, the MNEs would prefer to relocate their investment location choice.

*Alworth (1988)* [6] conducted research to explore the relation between bilateral tax treaties and FDI. He found that the MNE's choice of location is influenced by the existence of bilateral treaties which exempt taxes levied on income earned in the nations which are party to the treaty. There are studies which highlight that the amount of equity (funds) invested/reinvested in the host

country gets influenced by the consideration of “marginal costs of investment” i.e the relative net of tax returns available at home & abroad [20]. It is observed that there exists a huge difference in the tax rates applicable on corporate earnings and on various other activities related to business transaction. Many researchers have investigated into this phenomenon in the wake of increased or decreased FDI in the country.

*Grubert and Mutti (1991)* [55] estimated for the effect of national taxes on the US FDI in the ownership of property, plants and equipment in 33 economies. They mentioned in their study that high rates of local taxes curtail the FDI by the US owned firms in property, plants and equipments in the host country. The study also highlighted that tax rates are negatively and linearly co-related with FDI inflow. *Lynne (1991)* [91] in his doctoral dissertation on the US FDI inflows, applied cross-sectional regression analysis to sectoral inward FDI. The results revealed that FDI in a particular sector respond significantly to changes in the level of taxation in the sector. *Haddad and Harrison (1993)* [57] concluded in their studies that investment incentives like tax-holiday, import duties and tax exemptions play an important role in attracting FDI. *Woodward and Rolfe (1993)* [166] conducted an empirical investigation to identify the determinants of FDI in the Carribbean countries. Authors found that the lengths of tax holidays have significant impact on FDI inflows.

*Quazi (2007)* [115] analyzes the FDI inflow into 18 Latin American economies for the period 1995-2004. The author investigated into the effect of Rol and the economic freedom available in the host country on the quantity of FDI inflow. The study uses the natural log of inverse of per capita real GDP as a proxy for Rol and economic freedom index published by “The Heritage Foundation” and “The Wall Street Journal”. The findings revealed that both the variables have significant impact on FDI inflow into an economy.

*Loree and Guisuinger (1995)* [87] and *Dunning (2002)* [39] established a significant positive association between investment incentives and inward FDI. *Willhams and Witter (1998)* [161], while analyzing the FDI inflow into 67 transition economies, found that the host Government policies towards FDI have more significant impact over FDI inflows as compared to market factors. A study conducted by *Blomstrom and Kokko (2001)* [16] highlighted the significance of

investment incentives in attracting FDI. The authors, while reviewing the literature on links between FDI and transfer and diffusion of technology, observed that many developing countries have relied on fiscal incentives and transfer of technology to attract FDI.

*Zhang (2002)* [170], estimated the model of FDI determinants for 29 provinces in China from 1987-1998. He found that regional distribution of FDI in China's provinces was greatly influenced by the variation in the degree of incentives provided. *Francisca et al (1996)* [50] concluded that tariff barriers in European Union had a negative impact on the US FDI flows in EU.

However, certain studies, *Helliener (1988)* [62] suggested that investment incentives play a very restricted role in attracting FDI. In the case of MNCs the main intention in investing in foreign land is to maximize profit. So, the available rate of RoI in the host economy plays a significant role in location decisions. In developing economies good incentive policies can considerably affect the inward flow of FDI [143].

*Hakro and Ghumro (2007)* [59] conducted an empirical study for the annual data series from 1971 to 2005 to understand the determinants of FDI inflows into Pakistan. The study concluded that the investment environment related factors have a significant effect on the amount of FDI inflow. It suggested that the more the policies are investment pro, the more is the FDI that comes to the economy.

*Jessica (2001)* [72] studied the 12 year (1992-2004) dataset for 120 developing and transition economies to estimate the effect of bilateral investment treaties (BITs) and intellectual property rights. The study concluded that the host country policy related to BITs have significant positive impact on FDI inflow while intellectual properties rights have negative influence on inward FDI.

In the light of the growing competition among the developing economies, countries across the world are taking to *promotional activities* to attract FDI. There exists a considerable volume of literature which has investigated into the relationship between promotional activities and the FDI inflows in any economy.

*Wells and Wint, (1990)* [158] investigated into the effect of promotional activity on FDI inflow into 18 developed and 32 developing economies. The study indicated that promotional activities adopted by countries, especially developing economies, have a direct bearing on increasing FDI inflows. The Governments

across the world institute separate promotional agencies to encourage foreign investment in their land [101]

*Lim (2007)* [86] examined that how the establishment of Investment Promotion Agency (IPA) affect the flow of FDI to the economies. The researcher used three proxy variables, age of IPA establishment, strength of IPA's employees, domestic and overseas, to measure the effectiveness of IPA. The empirical results concluded that investment promotion tools have significant positive effect over FDI inflows. Inspired by the findings of such research studies, many developing countries in the decades of 1980s and 1990s developed special promotional and liberal investment policies to attract FDI.

However, a study conducted on developing countries to empirically study the effect of promotional activities on FDI inflow, concluded that although promotional initiatives and FDI inflows were positively related, yet the effect was insignificant [163].

## **E. RISK RELATED VARIABLES**

Historically, researchers have given a lot of significance to the pointers of risk. Infrastructure projects are associated with varied risks and research studies have shown that stakeholders get severely affected by the major risks and in many cases the projects have been translated into distressed or cancelled projects because of these risks [75]. Studies conducted on FDI in the emerging economies have elaborated on political and commercial risk which may emerge as a result of uncertain changes in policy, reversal of policy, fall in the demand of supply, nationalization of services, social disruption, political instability etc.

*Collier and Pattillo, (2000)* [25] conducted a research study to understand the relation between various risks economies face and inward FDI. They analyzed the FDI inflow and risk environment in Africa, and concluded that political uncertainty and policy reversal risks are effective deterrents to inward FDI.

*Mellahi et al (2003)* [95], in their study examined the factors responsible for affecting the decision of foreign firms to engage in FDI in Gulf Co-operation Countries. The results of the study revealed that the two most important factors that have significant impact on the FDI inflows are political and economic stability

of the country. *Kwang and Singh (1996)* [81], while finding the determinants of FDI in developing economies suggested that qualitative index of political risk has been a significant determinant of inward FDI in economies that have been successful in attracting FDI in the past.

*Wheeler and Moody (1992)* [110] while analyzing the effect of risks associated with political events in the host country on the US MNEs, found that political risk is a significant determinant of FDI. *Lucas 1993* [88], did lay great stress on economic and political risk as the determinants of FDI in emerging economies. However, there are studies which have produced results contrary to this conventional opinion.

*Holburn and Zelner (2008)* [64] conducted a research on sector specific FDI during the period 1990-1999. The authors studied the data on private electricity producer's locational choice for cross-border investment in power generation utilities. The results highlighted that firms from different countries respond differently to the same set of policy risk in the same locations. The study concluded that the host-country policy risk would not necessarily deter FDI investments. The argument put forth is that only a few firms develop capabilities and wisdom to spectacularly handle the risk.

## **F. CORRUPTION**

There exist two schools of thought related to the effect of corruption on FDI inflows into an economy. According to one school, high levels of corruption in an economy keeps MNCs away from the country, while the other school propagates that corruption in any economy provides an easy way to accomplish bureaucratic approvals and clearances.

*Wei (1999)* [156], while analyzing the FDI determinants in China, found that the level of bribery has significant impact on FDI inflow. *Smarzynska and Wei (2000)* [140] examined the relation between inward FDI and corruption in Eastern Europe and Former Soviet Union. The study concluded that the effect of higher corruption level is significantly negative on the amount of inward FDI in these economies. The study further elaborated upon the entry choice of the MNCs and the authors found that a high level of corruption is associated with a shift of choice towards joint venture from wholly owned subsidiary. The move is associated with



the expectation that the domestic partner will have a niche in dealing with the red tapism and corruption.

*Hakkala et al (2005) [58]* explored the effect of corruption in Sweden on the flow of FDI. The study concluded that corruption in any country decreased the level of horizontal FDI, but had a positive influence on the level of vertical FDI. Further, it put forth the view that corruption decreased the probability of MNCs investing in that economy, and that the effect of increased corruption level is more on smaller firms as compared to bigger firms.

However, *Hines (1995) [63]*, while studying the behaviour of the US MNCs, discovered that the US transnational corporations were not averse to enter a corrupt economy but were cautious of making joint ventures. *Wheeler and Mody (1992) [159]* while examining the US FDI in their study, failed to find any negative co-relation between corruption level and FDI stock in a country. *Bardhan (1997) [12]* and *Lui (1985) [89]*, undertook studies which suggest that corruption or bribery in a nation provides an easy way to get away with complex and inefficient regulatory and legal procedures, and so favors FDI.

## **G. BUSINESS ENVIRONMENT**

It is a well established fact that in most of the developing economies providing infrastructure to the people, was a public responsibility for ages; as such even after privatization the operation of these services requires co-ordination among several Government agencies and is likely to face certain regulations. Therefore, the issues of transparency in Government procedures and practices of good governance hold utmost importance [126]. Further, there are significant empirical evidences that suggest that economies with stronger property rights are able to fetch more private investment [77], [94], [131].

Table 2.1: Summary of the Literature review on specific determinants of FDI

	Study	Study type/Proxy variable	Findings
<b>A. MARKET SIZE</b>			
1.	Scaparlanda and Mauer (1969); [132]	Conceptual study	positive impact
2.	Agarwal (1980); [3]	Literature review	positive impact
3.	Dunning (1977); [38]	Theoretical study	positive impact
4.	Schneider and Frey (1985) [133]	Empirical study: Real per capita GNP	positive impact
5.	Root and Ahmed (1979) [124]	Empirical study: GDP	positive impact
6.	Woodward and Rolfe (1993) [166]	Empirical study: GDP per capita	positive impact
7.	Nakamura and Oyama (1998) [104]	Empirical study: GDP	significant but positively related in 4 cases and negatively in two cases
8.	Chanderprapalert (2000) [24]	Empirical study: GDP	positive impact
9.	Galan and Benito (2001); [51]	Empirical study: GDP and GDP growth rate	Significant and positively associated
10.	Tseng and Zebregs (2002); [149]	Empirical Study: GDP per capita	significantly and positively associated
11.	Vial (2002); [154]	Empirical study: GDP	positive impact
12.	Galego et al, (2004); [52]	Empirical study: GDP per capita	positive impact
13.	Swain and Zhang (1997); [144],	Empirical study: GDP and GDP growth rate	positive impact
14.	Zhang (2002); [171]	Empirical study: GDP	positive impact
15.	Wei and Lieu (2001); [157]	Empirical study: GDP	positive impact
16.	Eicher and Kang (2005); [44]	Empirical study: GDP	positive impact

Table 2.1 (contd.)

17.	Loree and Guising (1995); [87]	Empirical study: GDP	varying effects
18.	Wei (2000); [156]	Empirical Study: GDP	varying effects
19.	Asiedu (2002); [9]	Empirical study: GDP	no significant impact
20.	Edwards (1990); [43]	Empirical study: GDP	no significant impact
<b>B. MACRO-ECONOMIC VARIABLE</b>			
1.	Scheineder and Frey, (1985); [133]	Empirical study: Balance of payment of host Government	significant negative impact
2.	Rolfe et al, (1993); [123]	Empirical study:	macro-economic shocks discourage FDI
3.	Chanderpalert (2000); [24]	Empirical study: exchange rate fluctuations	significantly negatively associated
4.	Crow, (2001); [26]	Empirical study: exchange rate fluctuations	significantly negatively associated
5.	Erdal and Tatoglu (2002); [45]	Empirical study: exchange rate stability and economic stability	positively associated
6.	Abilava, (2006); [1]	Empirical study: Interest rate, currency fluctuation	interest rate: negatively associated currency depreciation attracts FDI
7.	Maniam and Chatterjee, (1998); [92]	Empirical study: exchange rate stability	weak exchange rate discourages FDI
8.	Nonnemberg and Mendonca (2004); [105]	Empirical study: Inflation and Country risks rating	significantly negatively associated
9.	Sayek Selin (1999); [131]	Empirical study: Inflation	significantly negatively associated

Table 2.1 (contd.)

<b>C. INSTITUTIONAL AND REGULATORY VARIABLES</b>			
1.	<b>Daude and Stein (2001); [30]</b>	Empirical: Government Institutions	good and strong government institutions have significant positive influence on FDI
2.	<b>Globerman et al (2004); [54]</b>	Empirical: Governance Index <sup>3</sup>	Positive influence legislation, regulation Governance and legal systems that condition freedom of transacting are important determinants of FDI to infrastructure sector
3.	<b>Quere (2005); [117]</b>	Empirical: Government Institutions	strong institutions attract FDI
4.	<b>Quere et al (2007); [118]</b>	Empirical: Government Institutions	significant positive
5.	<b>Ali et al (2008); [5]</b>	Empirical: rule of law, expropriation risk and propriety rights	significant role in attracting FDI
6.	<b>Trevino et al (2004); [148]</b>	Empirical: Institutional reforms	attract FDI
7.	<b>Pargal (2003); [108]</b>	Empirical: Pro-liberalization reforms, Stable legal institutions	positively influence FDI
8.	<b>Kral, (2004); [78]</b>	Empirical: Public Governance and regulatory framework	significant positive determinants
9.	<b>Saskia et al (1998); [129]</b>	Empirical: rule of law, administrative and legal structure in terms of transparency and accountability	significant positive association

Table 2.1 (contd.)



10.	Hymer (1960); [67]	Empirical: Strong Financial Institutions	significant positive determinants
<b>D. POLICY INCENTIVES</b>			
1.	Guisinger et al (1985); [56]	Empirical: Incentive related to foreign investment	significantly positively
2.	Alworth (1988); [6]	Empirical: Bilateral Tax Treaties	existence of bilateral treaties increase the prospects of FDI
3.	Boskin and Gale, (1987); [20]	Empirical: Marginal cost of investment	more is the tax on income less is FDI
4.	Grubert and Mutti (1991); [55]	Empirical: Local taxes	High rates of local taxes depress the FDI
5.	Lynne (1991); [91]	Doctoral dissertation: sector specific taxes	significantly negatively associated
6.	Haddad and Harrison (1993); [57]	Empirical: tax-holiday, import duties and tax exemptions	Significant impact
7.	Woodward and Rolfe (1993); [166]	Empirical: Length of tax holidays	Significant positive influence
8.	Quazi (2006); [116]	Empirical: Return on Investment, economic freedom index	ROI has significant positive impact, greater economic freedom increases FDI
9.	Willhams and Witter (1998); [161]	Empirical: FDI policies	Pro FDI policies significantly attract FDI inflow
10.	Blomstrom and Kokko (2001); [16]	Empirical: investment incentives	significant positive impact
11.	Zhang (2002); [171]	Empirical: FDI incentives	variations in investment incentives affect regional FDI

Table 2.1 (contd.)

12.	Francisca et al (1996); [150]	Empirical study: Trade barriers	Existence of trade barriers have significant negative effect on FDI
13.	Helliener (1988); [62]	Empirical study: Investment incentives FDI	Investment incentives play restrictive role in attracting FDI
14.	Sun et al, (2002); [143]	Empirical study: Incentive policies	Good incentive policies have significant positive influence on FDI
15.	Hakro and Ghumro (2005); [59]	Empirical study: Investment environment	Pro FDI investment environment significantly attract FDI inflow
16.	Jessica (2009); [72]	Empirical study: bilateral investment treaties (BITs) and intellectual property rights	BITs have significant positive impact ; intellectual property rights significant negative influence
17.	Wells and Wint, (1990); [158]	Empirical study: promotional policies	In case of developing countries: significant positive influence
18.	Mudami (1999); [101]	Conceptual: promotional agencies	Existence of promotional agencies positively affect FDI
19.	Lim (2001); [86]	Empirical: age of Investment Promotion Agencies (IPA) establishment, strength of IPA's employee: domestic and overseas	All the variables have significant positive impact on FDI
20.	Wint and Williams, (2002); [163]	Empirical: promotional initiatives	Promotional initiatives are positively related to FDI but affect is insignificant

Table 2.1 (contd.)

<b>E. RISK RELATED VARIABLES</b>			
1.	<b>Collier and Pattillo, (2000); [25]</b>	Empirical: political uncertainty and policy reversal risks	Both the variables are significant deterrent of FDI
2.	<b>Mellahi et al (2003); [95]</b>	Empirical: Political and economical risk	Political and economic stability attracts FDI
3.	<b>Kwang and Singh, (1996); [81]</b>	Empirical: qualitative index of political risk	countries having low political risk attract more FDI
4.	<b>Wheeler and Moody (1992); [159]</b>	Empirical: political risk	political risk is significant negative determinant
5.	<b>Lucas (1993); [88]</b>	Empirical: political risk and economic risk	both are significant determinants of FDI
6.	<b>Holburn and Zelner (2008); [64]</b>	Empirical: sector specific policy risk	affects varies, as firms develop wisdoms to handle the risks based on the home country experience
<b>F. CORRUPTION</b>			
1.	<b>WEI (1999); [156]</b>	Empirical: Bribery	significant negative impact
2.	<b>Smarzynska and Wei (2000); [140]</b>	Empirical: Corruption level	significant negative impact & higher corruption is associated with Joint venture entry mode by MNCs
3.	<b>Hakkala et al (2005); [58]</b>	Empirical: Corruption level	Higher corruption decreases horizontal FDI; Increases vertical FDI
4.	<b>Hines (1995); [63]</b>	Empirical: Corruption level	the US MNCs not averse to enter corrupt economies but prefer Joint Ventures

Table 2.1(contd.)

5.	<b>Wheeler and Mody (1992); [159]</b>	Empirical: Corruption level	found no negative co-relation between two
6.	<b>Bardhan 1997 and Lu (1985); [12]</b>	Conceptual study: corruption level	corruption in countries favors FDI
<b>G. BUSINESS ENVIRONMENT</b>			
1.	<b>Sader, (2001); [126]</b>	Theoretical review:	transparency in Government procedures and practices of good governance favors FDI in Infrastructure
2.	<b>Knack and Keefer, (1995); [77]</b>	Empirical: property rights	stronger property rights attracts FDI
3.	<b>Mauro, (1995); [194]</b>	Empirical: property rights	stronger property rights attracts FDI
4.	<b>De Soto, (2000); [31]</b>	Empirical: property rights	stronger property rights attracts FDI

### 2.3.2 Specific studies on India

As discussed earlier, very little empirical research has been conducted on identifying the determinants of FDI in India [7] [11] [79] [80] [127] [128] [139] [170]. Furthermore, much of the existing literature has focused on the overall FDI into the country and not in particular in a sector.

*Maniam & Chatterjee (1998)* [92] conducted a study to identify determinants of the US FDI in India. They reviewed the FDI flow from the US to India during the period 1962-1994. The result highlighted that weak exchange rate was one main deterring factor for the US FDI in India apart from poor infrastructure and red tapism. *Sahoo (2006)* [127] investigated into the determinants of FDI to 5 South Asian economies, India, Pakistan, Bangladesh, Nepal and Srilanka. The researcher found that in the case of India, GDP growth rate caused FDI, and policies that liberalize trade further attracted FDI.

*Singh (2007)* [135], while making a comparative study of policy and institutional environment related to private and foreign investment in power sector, argued that strong regulatory framework for the sector and stable macro-



economic environment were the most important variables to attract foreign investment in this sector in India.

*Sinha (2008)* [139], in her doctoral thesis investigated the reasons for FDI in China and India. The main objective of this dissertation was to highlight the cause of higher level of FDI coming into China and to draw lessons for India. Apart from this, the researcher also made an effort to find the factors responsible for fetching the increased FDI inflow to India during 1992-2005. The results as summarized indicated that the main determinants of FDI in India have been its big market size, relatively good market growth, human resource, and political stability.

*Zeng (2009)* [170] in his study explored the factors attracting FDI in India and China. The empirical results depicted that market growth, labour costs, country's political risk/policy, liberalization and geographical and cultural factors are the important determinants for India.

### **2.33 Specific studies on infrastructure**

Services in infrastructure sector are mostly non-tradable and are location-bound. Therefore the existence of a sizeable affluent market and future growth prospects of the consumer base are central in attracting FDI in this sector [151], as FDI in infrastructure sector is market-seeking unlike resource seeking FDI in the manufacturing sector.

*Woodhouse (2005)* [165] conducted a study on nine economies to identify the factors that create conducive investment climate for private investment in the power sector. According to the study, strong public finances, sector viability, efficient fuel market, stable political climate and responsive legal framework are important considerations for any private firm before investing in the power infrastructure. Further, it is a well-established fact that in most of the developing economies, providing power to the people has been a public responsibility for ages. As such, even after privatization the operation of these services require co-ordination among several Government agencies and is likely to face certain regulations. Therefore, the issues of transparency in Government procedures and practices of good governance hold utmost importance [126].

Lamech and Saeed (2003) [82], conducted a survey among the foreign investors in the power sector in developing nations. The survey revealed that decisions regarding FDI are influenced mainly by three factors, legal framework that covers investors' rights and obligations, strictness in enforcement of payment, and availability of Government guarantee or counter guarantee from multilateral agencies.

**Table 2.2: Summary of the important studies reviewed on FDI determinants in India**

INDIA	
Study	Findings
Maniam & Chatterjee, 1998; [92]	Empirical: weak exchange rate was one main deterring factor for the US FDI to India apart from poor infrastructure and red tapism
Kumar, 2000; [79]	Empirical: Infrastructure availability contributes to the relative attractiveness of the country towards FDI
Singh, 2005; [135]	Conceptual: Procedural and policy reforms undertaken by State Governments attracted FDI in mid ninties
Sahoo, 2006; [127]	Empirical: GDP growth rate and policies that liberalize trade further attract FDI.
Archana et al, 2007; [7]	Empirical: India is a cost-effective destination for FDI.
Singh, 2007; [135]	Conceptual: strong regulatory framework and stable macro-economic environment
Sinha, 2008; [139]	Doctoral dissertation, Empirical analysis: big market size, relatively good market growth, human resource and political stability are main determinants.
Zeng, 2009; [170]	Empirical: market growth, labor costs, country political risk/policy liberalization and geographical and cultural distance are the important determinants for India.

The other critical factor influencing the FDI decision pertaining to service sector, especially in developing economies, is the macro-economic stability of the host nation. As these firms basically produce for the local market and earn in local currency, any macroeconomic shock will thus be detrimental to the firm's rate of return [123]. The East-Asian financial crisis and the Latin American currency crisis of 1997 and 2001 respectively, forced many foreign investors to revisit their strategies towards investment in the services sectors in developing economies. A recent study pertaining to FDI in power noticed that FDI in the sector declined as a whole in the developing economies following the East Asian macroeconomic turmoil [26].

Some researchers have argued that FDI in the power sector gets deterred by the political ineffectiveness and risk of political expropriation of foreign assets in the host country<sup>4</sup>. According to certain studies, government policies and regulations are the other most important determinants to Services FDI [11]. Market size, as highlighted by UNCTAD survey, is another important feature for attracting FDI in services.

*Jensen and Brude (2005)* [71], investigated into the factors that influence the private sector participation (PSP) in water and sanitation sector in developing economies. They studied a sample of 60 countries with 460 PSP projects and found that countries with greater domestic market and higher paying capacity attract more private investment. The study also concluded that existence of strong rule of law and low level of corruption are significant determinants of private investment in this sector.

*Singh and Jun (1995)* [136] and *Bloniga (2005)* [18] revealed an exhaustive review of country specific determinants affecting FDI in the services sector. They categorised these into three sections- economic, host country policies and institutional factors. *Stern and Cubbin (1985)* [141] concluded in their study of FDI in the electricity sector in developing economies that the effectiveness of regulatory agencies is very important factor in promoting investment in the electricity sector. Absence of regulatory environment was cited as a cause for the failure of early Independent Power Projects [IPPs] in Mexico [90]. "The transition from the initiation of sectoral reforms to the point when the rules of the game for private investors are clear" is identified as a fundamental constraint on private

investment in the electricity sector [125]. *Kirkpatrick et al (2006)* [76] conducted research to study the effect of institutional efficacy on private investor's locational choice pertaining to FDI in infrastructure sector. The purpose of this article was to assess the impact of regulatory governance on FDI in infrastructure projects in middle and low income economies. It argues that FDI in infrastructure responds positively to the existence of an effective regulatory framework that provides regulatory credibility to the private sector.

Some researchers have argued that FDI in the power sector gets deterred by the political ineffectiveness and risk of political expropriation of foreign assets in the host country [162]. According to certain studies, government policies and regulations are the other most important determinants for Services FDI [106]. Market size, as highlighted by UNCTAD survey, is another important feature for attracting FDI in services. Market-supporting institutions play an effective role in attracting private investors to infrastructure projects. Absence of these institutions deters private investment in infrastructure sectors [36] [121]. According to *Dailama and Leipzeig, (1998)* [27], good policies of the host country like financing guarantees, tax incentives and risk mitigating instruments, have significant positive influence on private investment flow to infrastructure projects.

Infrastructure projects involve large sunk cost and lack mobility. As such, these projects face the risk of post-investment opportunistic behaviour of host Governments [162]. Firms use legal contractual arrangements as risk-mitigating instruments to avoid such risks. In such a scenario, the legal and regulatory environment, governing such contracts and effective rule of law become critical determinants of private investment in infrastructure sector [106]. A study, conducted to investigate into the success and failure of Build-operate-transfer model in Asia, concluded that existence of transparent investment procedures and effective regulatory systems attracted more private investment in infrastructure sector [145]. *Banerjee et al (2006)* [10] conducted an empirical research to analyze the effect of institutions on private sector development in infrastructure sector, using longitudinal dataset of 40 developing economies. The results indicated that institutions, mainly regulatory and legal, played a significant role in encouraging private sector participation in infrastructure sector.

**Table 2.3: Summary of the Literature review on private sector participation in infrastructure projects**

<b>INFRASTRUCTURE SPECIFIC STUDIES</b>		
<b>Study</b>	<b>Sector</b>	<b>Findings</b>
<b>UNCTAD, 2008; [151]</b>	Conceptual: over all	Affluent market and future growth prospects
<b>Woodhouse, 2005; [165]</b>	Empirical: power sector in developing countries	Strong public finances, sector viability, efficient fuel market, stable political climate and responsive legal framework
<b>Sader Frank, 2000; [126]</b>	Conceptual: over all	Transparency in Government procedures and practices of good governance hold utmost importance
<b>Lamech and Saeed, 2003; [82]</b>	Empirical: power sector in developing countries	Legal frameworks that cover investors' rights and obligations, strictness in enforcement of payment and availability of Government guarantee or counter guarantee from multilateral agencies attracts FDI
<b>Kirkpatrick et al, 2006; [76]</b>	Empirical: infrastructure in developing countries	Role of regulatory bodies, institutions
<b>Quium, 2003; [119]</b>	Review of cases in transport sector in Asia-Pacific countries	Bankability of the projects, pricing policy and regulatory mechanism are important for attracting private investment
<b>Crow, 2001; [26]</b>	Empirical: power sector in East Asian countries	Macroeconomic stability is important determinant
<b>Holburn, 2001; [65]</b>	Power	Political ineffectiveness and risk of political expropriation of foreign assets in the host country
<b>Banga Rashmi, 2005; [11]</b>	A review of theoretical and empirical studies in service sector	Government policies and regulations, size and character of local market
<b>Singh an Jun, 1995; [136]</b>	service sector	Economic factors, host country policies

Table 2.3 (Contd.)

<b>Blonigen, 2005; [18]</b>	service sector	Institutional factors
<b>Stern and Cubbin, 2005; [141]</b>	Empirical: power sector in developing economies	Effectiveness of regulatory agencies
<b>Protego, 2000; [114]</b>	Empirical: power sector in Mexico	Absence of good regulatory environment deterred FDI
<b>Sharma and Vohra, 2008; [134]</b>	Conceptual: power sector in India	Corruption , red tapism, governance arrangements and practices, lack of capacity to prepare, negotiate, implement and enforce complex cross-country arrangements and deals; failure of joint ventures other important deterrent to FDI
<b>Thomsen , 2002; [147]</b>	Conceptual: overall infrastructure in India	Efficacy of regulatory agencies and cross-sector subsidies affect FDI inflow
<b>Jensen and Brude, 2005; [71]</b>	Empirical: water and sanitation sector in developing economies	Greater domestic market and higher paying capacity, rule of law and low level of corruption attract more private investment
<b>Ramamurti and Doh, 2004; [121]</b>	Empirical: overall infrastructure	Regulatory institutions important for private investment in infrastructure
<b>Dailama and Leipzeig, 1998; [27]</b>	Empirical: overall infrastructure	Financing guarantees, tax incentives and risk mitigating instruments
<b>North, 1990; [106]</b>	Empirical:	Legal and regulatory environment are critical determinants of FDI
<b>Tam, 1999; [145]</b>	Conceptual: BOT model in infrastructure projects in Asia	Transparent investment procedures and effective regulatory systems attract more private investment in infrastructure sector
<b>Banerjee et al, 2006; [10]</b>	Empirical: Infrastructure in 40 developing countries	Institutions mainly regulatory and legal play significant role in encouraging private sector participation in infrastructure sector

### 2.3.4 Institutional Studies on FDI in Infrastructure Development

FDI in the infrastructure development grew significantly in the 1990s as a result of liberalization policies of many of the world economies. So, the studies of the determinants of FDI in infrastructure sector were mostly conducted during and after this period only. Consequently, there is very little specific literature on this subject and whatever studies have been done are mostly those sponsored by the multilateral funding agencies, namely World Bank, ADB, DFID, FIAS, JBIC, PPIAF. It is relevant here to mention a few of the important studies conducted by these agencies to identify the major constraints on investment in infrastructure sector.

**Foreign Investment Advisory Services (FIAS)**<sup>5</sup>: A study [37] was sponsored by FIAS to find the major impediments to foreign investment in infrastructure sector in Eastern and Southern Africa region. The findings summarized that the main obstructions to private investment in infrastructure in this region were mainly the same as encountered by other developing countries. The most common difficulties highlighted were as follows

- Lack of Government commitments
- Lack of reliable privatization program
- Lack of transparent selection and negotiation process
- Higher development and transaction cost of the project
- Uncertain and unaccountable behavior of the Government
- Lack of commercial pricing of the services in lieu of subsidies
- Lack of capacity and entrepreneurship among the domestic partners
- Lack of strong domestic financial market
- Lack of regulatory institutions
- Efficacy of the legal institutions

FIAS, in one of its studies [22] summarized its experience related to major policy issues which have affected the FDI in infrastructure in developing countries. The document is a compilation of various experiences of International Finance Corporation which it has gained by sponsoring varied infrastructure projects in developing economies. The document summarized the main obstacles as

- Lack of clear concession arrangement which defines the roles and responsibilities of different stakeholders
- Foreign exchange convertibility risk, i.e the inability of the foreign investor to convert profit earned in the host country to home country currency. The other major aspect is the inability of the investor to serve its foreign debt timely.
- Ownership restrictions discourage foreign investment greatly.
- Lack of strong legal institutional framework, to enforce contract and to have secure dispute resolution mechanism.
- Difficulty in attracting term debt for project financing because of country risk factor
- Pricing of infrastructure services.

**Public Private Infrastructure Advisory Services (PPIAF)**<sup>6</sup> conducts studies to examine the status of infrastructure development across developing countries. One of its recent studies conducted by *Monsalve, (2009)* [99] investigated into the experience of PPP projects in transport infrastructure in Europe and Central Asian countries. The study explored the various successful and failed PPP transport projects and highlighted the various factors that affect the private investment in this sector. A few of the important impediments, which need to be fixed in order to tap private investment in this sector, are

- Lack of legal and regulatory framework in the sector
- Efficacy of risk sharing mechanism between public and private partners
- Lack of transparent and effective contract procurement and monitoring process
- Appropriateness of legal and regulatory framework
- Lack of central unit to co-ordinate lead preparation
- Involvement level of multilateral funding agencies in providing guarantees and lending support.

Also, over a period of time PPIAF has done analysis of projects supported by it and has identified specific barriers to private investment in infrastructure development. These are Government capacity, high political risk, cost-recovery vs. subsidies, and risk adversity of investors since 1997.



According to Energy Sector Management Assistance Programme (**ESMAP**)<sup>7</sup> flow of FDI in decentralized energy utilities is low due to high transaction cost of these projects, political resistance and incapability of working effectively under certain circumstances. General barriers are identified as:

- Rigid legal and regulatory frameworks
- Energy market rules that eliminate small producers
- Lack of business experience of traditional entrepreneurs
- High market and project development costs and risk mitigation instruments
- Difficulty in accessing pre-investment financing
- Prohibitive banking regulations
- High commercial risks given the low effective demand
- Limited knowledge about best practice and scaling up
- Perception that decentralized off-grid solutions are inferior to national energy networks

According to **InfraCo**<sup>8</sup> the factors that discourage private investment in infrastructure sector ranges from market failures to insufficient risk coverage. The main obstacles that deter private investors from investing in this sector are:

- Weak legal institutions
- Lack of effective regulatory environment
- Absence of long term debt market
- Absence of efficient risk-coverage mechanism
- Political priorities and vested interests
- High up-front cost of developing project in particular economy

**World Economic Forum (2007)** constructed Infrastructure Private Investment Attractiveness Index (IPIAI). It contains the factors identified as important variables affecting the flow of private investment in infrastructure projects. IPIAI was specifically developed to study the attractiveness of a selected

number of Latin American countries towards private investment in infrastructure sector by measuring the variables mentioned in this index. These variables are:

- Host country's macro-environment
- Efficacy of the legal framework, including regulatory environment of the host nation
- Political risk
- Access to information
- Financial market stability and maturity
- Earlier private investments
- Government institutions and users willingness to pay
- Host Government's preparedness and willingness to involve private sector

## 2.4 CONCLUSION

The literature review indicates that there is variety of factors that act as determinant as well as deterrent of FDI under different conditions. The researcher reviewed almost over 100 studies, most of them being empirical and conducted for developing economies. The Table 2.4 and Table 2.5 below provide the statistics of the studies reviewed.

The main objective of providing this statistics is to highlight the existing gap in the literature between the availability of sector-specific and that of country-specific studies. However, the studies reviewed by the researcher do not necessarily represent the overall existing literature on the determinants of FDI, and yet the proportional representation of the studies is there.

The other important objective of literature review was to identify the factors which have been historically highlighted as the determinants or deterrents of FDI in any economy. Based on the literature review, the researcher found that the two main broad approaches to identify the determinants of FDI are, theoretical and econometrical models relying either on secondary or primary data with very few conceptual studies.

**Table 2.4: Summary of the Literature review on specific determinants of FDI**

S. No.	Variables Reviewed	No. of Studies
1.	MARKET SIZE	20
2.	MACRO-ECONOMIC VARIABLE	09
3.	INSTITUTIONAL AND REGULATORY VARIABLES	10
4.	POLICY INCENTIVES	20
5.	RISK RELATED VARIABLES	06
6.	CORRUPTION	06
7.	BUSINESS ENVIRONMENT	05

**Table 2.5: Statistics of the Studies Reviewed**

S. No.	Study Type	No. of Studies
1.	Studies on determinants of overall FDI to an economy	76
2.	Studies on determinants of FDI to India	12
3.	Studies on determinants of FDI/private investment to infrastructure sector	21
4.	International global development agencies/multilateral development agencies studies on private sector investment in infrastructure sectors	06

A significant number of studies in the literature mentions the importance of market related factors in affecting FDI inflows. Most of the findings highlight the significance of *GDP*, *GDP per capita* and *GDP growth rate* in attracting the FDI to an economy. Empirical literature also argues in support of the importance of macro-economic variables for the existence of FDI in any country. Academically, researchers have used certain proxy variables to measure the efficacy of macroeconomic stability for affecting the amount of FDI inflow in any country. These proxy variables as identified after reviewing the literature are as follows: *exchange rates*, *exchange rate fluctuations*, *inflation*, *interest rates* and *country risk rating*.

Further, there are a number of studies which suggest that the lack of stable and efficient institutional framework eventually deters FDI from any economy. The institutional variables which considerably affect the FDI inflows, as tested in the literature, are *stable rule of law*, *regulatory framework*, *governance institutions* and *financial institutions*. The studies do also argue to demonstrate the substantial

influence of incentive related policies over locational choice of the MNCs. The literature findings suggest that pro-investment policies of the host government and promotional activities adopted by the Governments significantly impress the FDI inflows.

The empirical studies investigate into the effect of business environment and corruption on FDI inflows. The concerned authors use various measures of business environment like business index of GCR, instances of red tapism, process of approval and clearances etc to study the impact on FDI inflows. A whole lot of empirical literature is dedicated to quantify the effect of corruption on host country's FDI inflow. The studies in most of the cases use Corruption Index, modeled by Transparency International, to measure the extent of corruption in economies.

All these factors identified have appeared in some or the other studies, under the four different categories of literature, reviewed by the researcher. Taking lead from this, the investment related environment for FDI in infrastructure sector in India, is scrutinized under the important heads of- **Market variables, Macroeconomic variables, Institutional and Regulatory variables, Business variables, Investment environment variables, Financial variables, Corruption environment and Risk-related variables.**

## ENDNOTES

<sup>1</sup> Dunning , J. H. (1993) [40] conducted a research titled “ Multinational enterprises and the global economy”. He was influenced by *Mundell's 1957* [102] study on “International trade and factor mobility”, in which Mundell summarized that factor endowments and relative factor costs play effective role in attracting FDI. Inspired by these results, Dunning also worked towards finding the location determinants of FDI. In the study, before exploring the location –specific factors for FDI, he categorized the FDI on the basis of motives for conducting it. As, he believed, different types of FDI would be influenced by different factors. What may be a determinant for market-oriented FDI may not be attractive for resource-seeking FDI.

<sup>2</sup> Neo-classical theories relied heavily on the assumptions that international investment or FDI was basically a one-way phenomena, i.e, it was from developed to less-developed countries only. However, later studies were based on the post-war trends which provide evidence for both FDI inflows and outflows from countries.

<sup>3</sup> Governance index was developed by Kaufmann, Kraay and Zoido Lobaton in 1999. They estimate six separate indices which measure – the rule of law, political instability, regulatory burden, voice and political freedom and government effectiveness.

<sup>4</sup> See Holburn, G. L. F. and Zelner, B.A (2008) [64] "Policy risk, political capabilities and international investment strategy: evidence from the global electric power industry," available at SSRN: <http://ssrn.com/abstract=1091615>; Henisz, W. J. (2002) , "The institutional environment for infrastructure investment", *Industrial and Corporate Change*, Oxford University Press, vol. 11(2), pages 355-389

<sup>5</sup> FIAS is a joint-facility of International Finance Corporation and World Bank. It provides the investment related advisory services to countries across the world. Apart, from it FIAS also undertakes substantial research studies related to investment environment across the globe.

<sup>6</sup> PPIAF is a multi-donor facility to assist governments at all stages of the process of engaging the private sector in infrastructure development.

<sup>7</sup> ESMAP is a technical assistance programme managed by the World Bank that was established in 1983. It focuses on the role of energy in economic development.

<sup>8</sup> A private sector company registered in U.K complements the work of other PIDG facilities, particularly DevCo, by acting as a principal project developer to stimulate greater private investment in African and Asian infrastructure development



**CHAPTER 3**

## **SECTION A: ROAD INFRASTRUCTURE IN INDIA**

In the following chapter, the researcher first highlights the economics of Indian road, power and railways sector in terms of its GDP share and its impact on other sectors, specifically manufacturing, and a mild comparison with a few other economies, both developing and developed. Then, the section proceeds to lay down current statistics about physical progress achieved, identification of gaps and requirements to support the continuing growth process, and finally talks about the financing of this sector.

### **3.1.1 INTRODUCTION**

The importance of road network and its impact on economic development is a considered subject matter of road economics. The GDP share of transport sector in India was estimated to be 7.6% in the year 2007, where road transport contributed 4.7%. The road sector in India handles 65% of the overall freight and about 87% of the passenger traffic. A recent study conducted on India highlighted that the share of road sector in total freight movement in India has been increasing over the past three decades which is estimated to have increased from 34.5 percent in 1970-71 to around 63 percent in 2001-02 [33]. This conveys that financial economy from this sector is on a rapid rise, and this sector contains a lot of potential to be the most preferred mode of transportation for both freight and passenger movement, over the present cheapest mode of transportation, railways. However, on a comparison with China it is observed that India is still a back bencher in terms of obtaining excellent gains from this sector (Figure 3.1.1).

The road sector has great employment potential too, especially in rural areas and can act as a poverty reduction measure. Rural road construction is a labor intensive industry and provides immediate relief to the rural poor. For instance, the National Highways Development Programme (NHDP) is alone expected to provide employment opportunities to around 2,50,000 construction workers in India. A study conducted on India over the period 1970-1993 concluded that investment in rural roads contributed effectively to productivity growth, since an additional Rs.100 billion invested in roads would increase

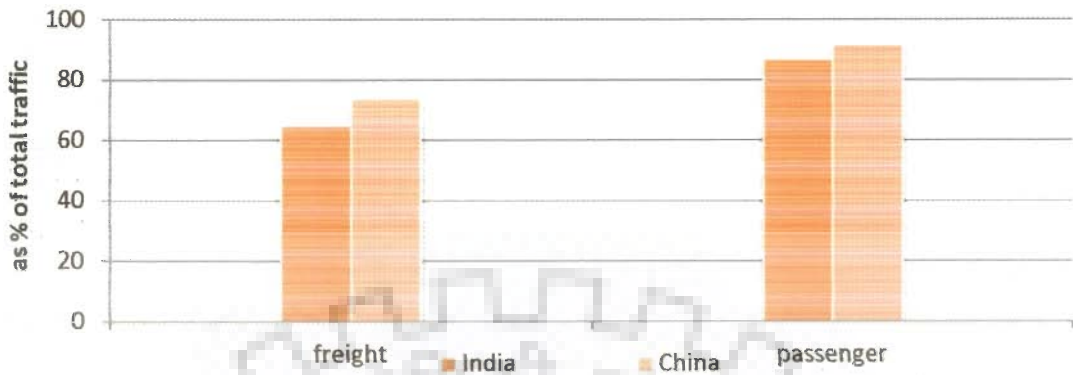
productivity growth by more than 3 percent [47]. At present India spends around \$ 4 billion annually on road development programmes [70].

It has been realized time and again that the greatest impediment to rapid growth of manufacturing sector and exports in India is inability to quickly and efficiently transport products from inland facilities to its ports. China's economy is 3.5 times larger than that of India, it is about US \$ 3.3 trillion for China and US\$ 928 billion for India, [69]. One major contributor to China's big economy is its manufacturing sector. The share of manufacturing sector in GDP is 34% for China and only 15% for India, and their global ranking is 3<sup>rd</sup> and 12<sup>th</sup> respectively (Figure 3.1.2). In the exports sector too China is a better performer than India. Although India's exports almost doubled in the decade, 1995-2004, yet its share in the world exports rose from 0.6% to 0.8% only [164]. China's present share in total world export is almost eight times greater than that of India (Figure 3.1.3). India's infrastructure-deficient environment has been one important cause of hampering the growth of manufacturing and exports especially the poor network of National Highways and erratic power supply. National Highways creation in India has lagged as compared to that in China in the last decade (Figure 3.1.4). This trend is a clear indicator of India's initial ignorance about the importance of creating road assets to boost up economy as a whole and manufacturing sector in particular.

The logistics cost in India is 13% of GDP due to under-developed trade and logistics infrastructure, while it is less than 10% of GDP in almost entire West Europe and North America [28]. The costs associated with moving cargo in India are some of the highest in the world at 11 percent of landed cost, compared with a global average of 6 percent. It is estimated that the inadequate physical road connectivity, possibly constraints growth of GDP up to 2 percentage points a year [35].

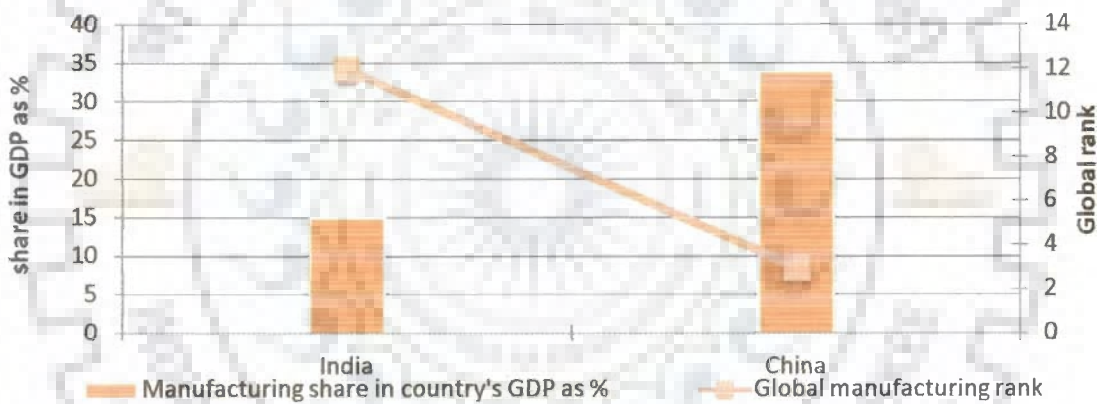


**Figure 3.1.1: Modal Road Traffic Share as Percentage of Total Traffic - India & China (2008)**



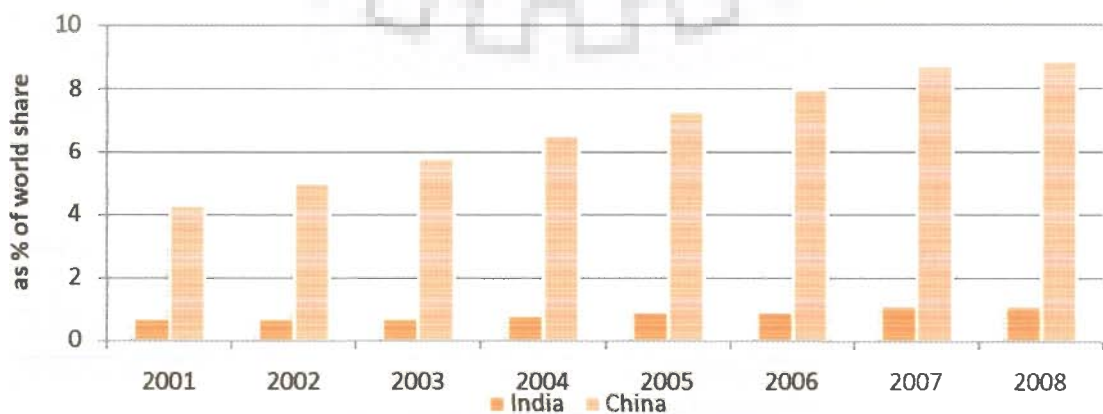
Source: Department of Road Transport & Highways, India; China Statistical Year Book

**Figure 3.1.2: Growth of Manufacturing Sector - India & China (2008)**

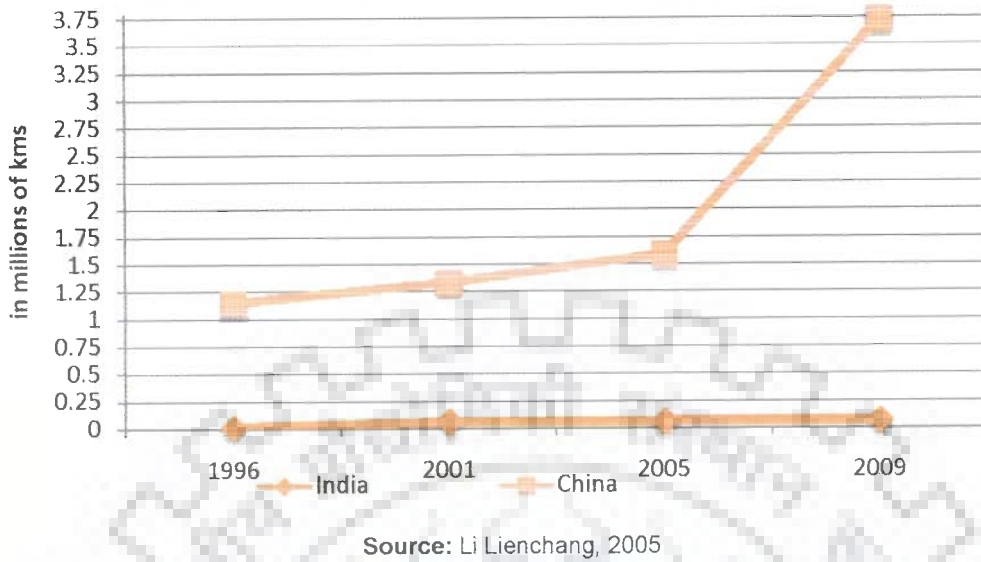


Source: Global Insight and RBI - India; Global Insight – China, 2008

**Figure 3.1.3: World Export Share - India & China (2008)**



Source: International Financial Statistics

**Figure 3.1.4: Growth of Length of Highways 1996-2009 - India & China**

### 3.1.2 PHYSICAL STATUS

#### 3.1.2.1 Current Status of Road Network in India: A comparative view

India has the second largest road network of the world, but the standard of its road network is far below the expectations (Table 3.1.1). China which does not have a very long history of building highways and expressways scores much better than India (Table 3.1.2). While considering the road network in any economy it is not only the length which matters but the quality of the road infrastructure also becomes an important determinant to evaluate the overall road infrastructure availability. Here we assess the road quality of five world economies (Figure 3.1.5). India scores 3.2, while the world average for this period is 3.7. Even economies like Guatemala, Pakistan, and Botswana fare better than India.

Another important indicator communicating the slow progress in this sector happens to be in terms of the widening status of the highways. The poor performance of India in developing quality road network is also evident from the performance as recorded under 10<sup>th</sup> FYP. Figure 3.1.6 exhibits that under any of the three broad categories of National Highways it has not been possible to achieve the target. As given in (Figure 3.1.6) comparing India's performance with that of China it may be remarked that the gap between the two economies is alarming. This poor performance of India makes it difficult to achieve the targets

set for 2011, as far as the road development progress is concerned. The Vision document 2021 for road network development in India says that by 2011 the length of four-laned and bigger highways would be 16000 kms, and the length of two-laned highways would come down to 15000 kms, while expressways will be as long as 3000 kms. However, the country's performance in the road sector under the 10<sup>th</sup> Plan period (Figure 3.1.6) raises doubts about the success of targeted plan.

**Table 3.1.1: Road Network in India up to March, 2009**

	Particulars	Length in kilometers
1	Total Road Length	3.85 million kms (second largest in world)
2	National Highways	0.0705 million kms (2% of total road network & carries about 40% of traffic)
3	Expressways	200 kms
4	State Highways	0.128 million kms
5	Major District Roads	0.470 million kms
6	Village and Other Roads	2.65 million kms
7	Surfaced Road Lengths	1.604 million Kms (48.6% of total road length)
8	Rural Access to All-Season Roads	60% of villages

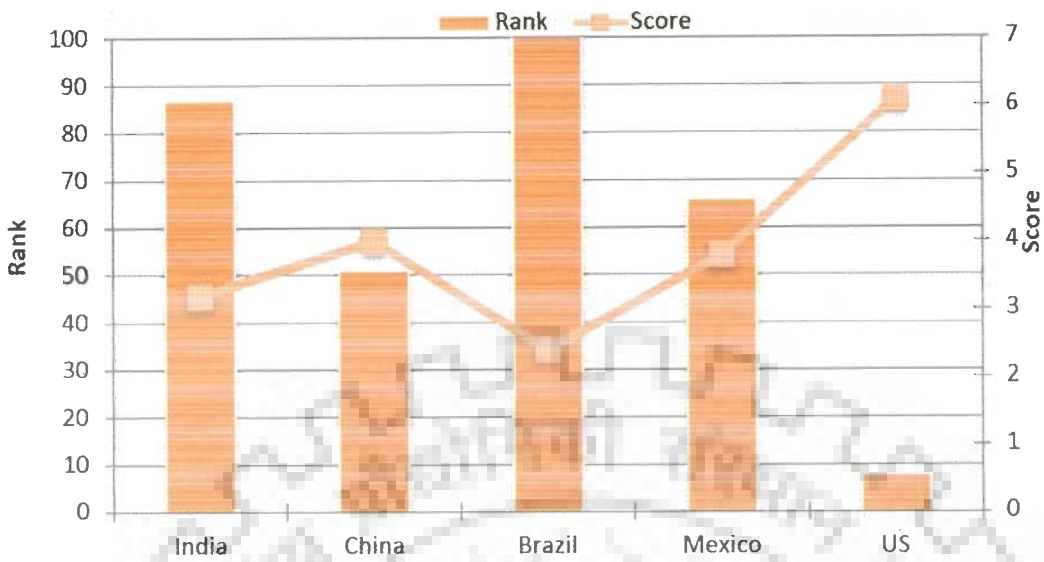
**Source:** Annual Report -2008-09, Department of Roads and Highways, India; World Bank.

**Table 3.1.2: Status of Road Network - India and China**

	Particulars	India	China
1	Total Road Length	3.85 million Kms.	1.87 millions Kms.
2	Highways Length	0.198 million Kms	3.7 million Kms
3	Expressways Length	200 Kms.	0.045 million Kms.
4	% of Paved Roads	62.6%	82%

**Source:** World Development Indicators 2008; National Bureau of Statistics, China; Department of Road Transport and Highways, India.

Figure 3.1.5: Road Quality (2008-09)



Source: Infrastructure GCR, 2008-09, WEF

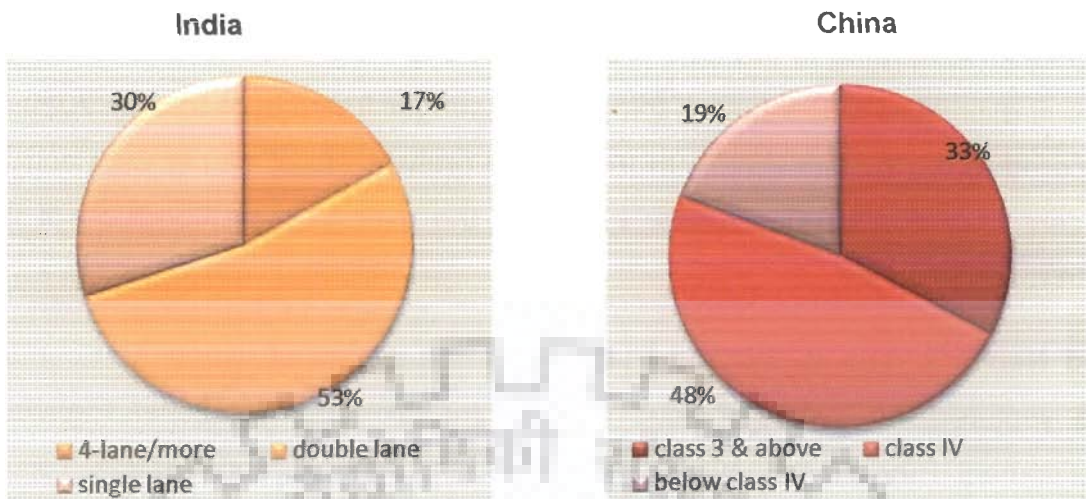
Note: Scoring is on seven point scale where, 1-underdeveloped and 7-as extensive and efficient as the world's best

Figure 3.1.6: Highways Performance under 10th FYP in India



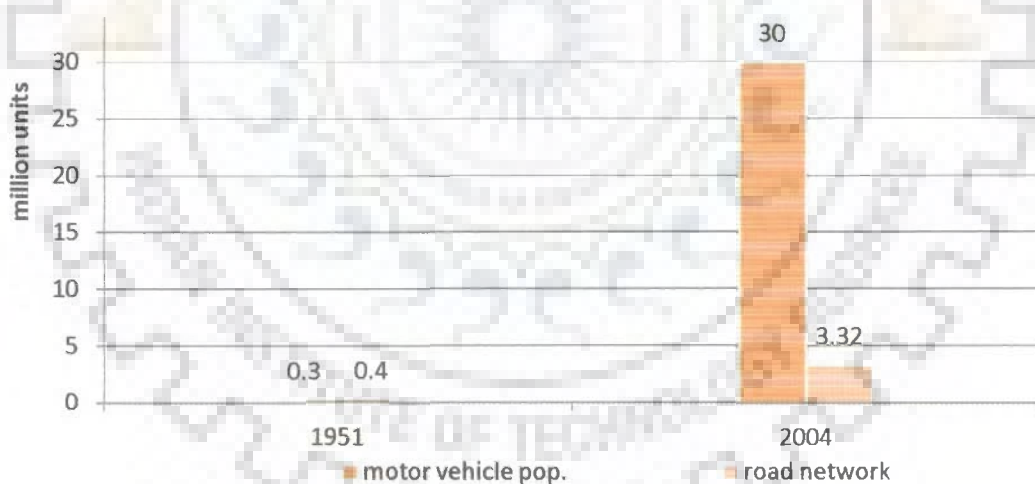
Source: Department of Road Transport & Highways, India.

Figure 3.1.7: Widening Status of National Highways



Source: Annual Report 2008-09, Department of Road Transport & Highways, India; National Bureau of Statistics, China, 2008.

Figure 3.1.8: Motor Vehicles Population Vs. Road Length: India



Source: Li Liancheng (2005)

Also, if we relate the growth in motor vehicles population to the increase in road network, it will again present a very dismal picture. The increase in motor vehicle population is almost 100 fold (0.3 million to 30 million units) while that in road network is just 8 fold (0.4 to 3.32 million kms) over the period 1951 to 2004 (Figure 3.1.8). This poor structure in terms of suitable road-width and length, keeping in view the increasing passenger and freight traffic on National Highways, is one of the reasons of below average productivity of trucks used for logistics

purpose in India. On an average, a truck travels a distance of 200 kms a day in India, as against 350- 400 kms that would be possible through reduction of congestion. According to the data presented by Planning Commission, the freight traffic is estimated to increase 5 fold and passenger traffic by 4 fold by 2020 as compared to the current level with the annual growth rate of 18 per cent and 15 per cent respectively. This further highlights the overstressing condition of the Indian road network.

**Road Network: The Ambitious Plans-** With the advent of twenty first century India ventured into two ambitious road sector projects – National Highways Development Programme (NHDP) and Pradhan Mantri Gramin Sadak Yojana (Prime Minister Rural Road Project/ PMGSY).

**National Highways Development Programme (NHDP)-** NHDP was launched in 1999 and it has three main components – North-South-East-West corridor (NS-EW), Golden Quadrilateral (GQ) and four – laning of highways. However, the performance of these grand projects is poor at most of the fronts. GQ project was slated to be completed by the year 2003 and later it was extended to 2005 and NS-EW by 2007. However, according to the estimates, NSEW and GQ project are unlikely to be completed before 2011 and 2010. Table 3.1.3 provides the status of the projects under NHDP. NHDP project is divided into seven phases (I-VII) at present phase I, II, III and V are being implemented, but by the end of 10<sup>th</sup> Plan period only phase IIIA is reached and Phase I and II are also yet incomplete.

**Table 3.1.3: NHDP Status as on 31<sup>st</sup> December 2009(as of 31<sup>st</sup> March, 2007)**

PARTICULARS	GQ	NS-EW	NHDP III	NHDP V
<b>Total Length</b>	5846	7300	12109	6500
<b>Already 4-Laned</b>	5597	4587	1190	148
<b>Under implementation</b>	249	1918	3170	886
<b>Balance length</b>	-	637	7749	5466

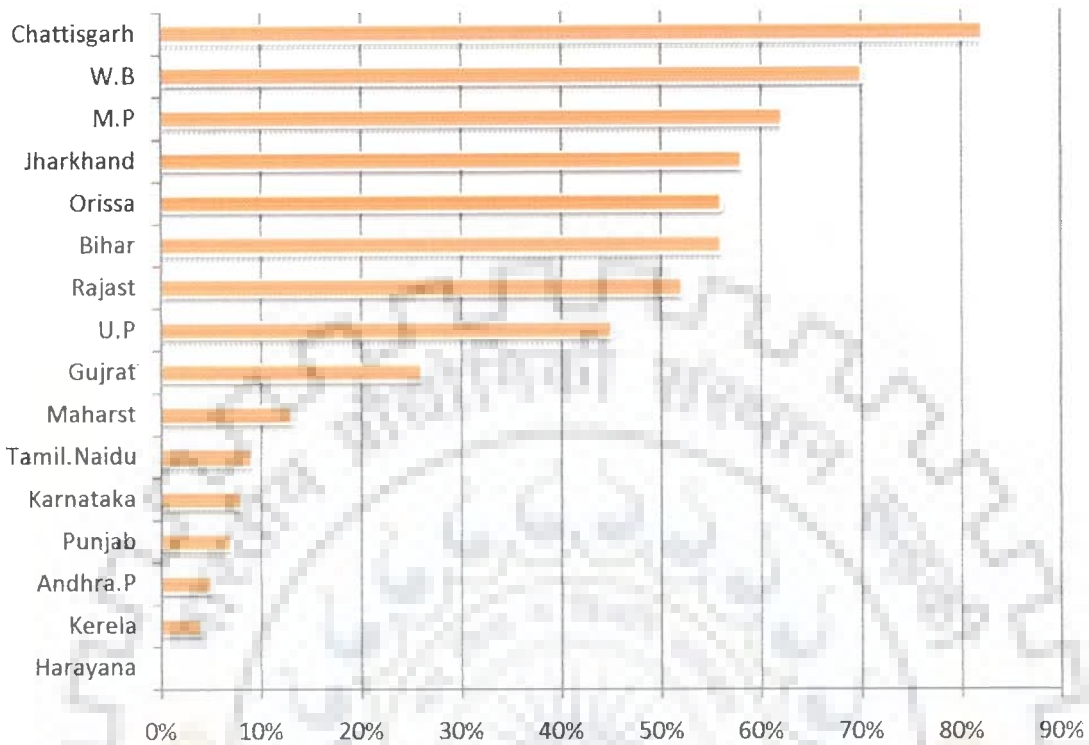
Source: National Highways Authority of India (NHAI), India.

### **Pradhan Mantri Gramin Sadak Yojana (Prime Minister Rural Road Project/ PMGSY)-**

One of the most high profile rural connectivity projects in rural development history of India, PMGSY started in 2000 to provide road connectivity to about 172,772 habitations, with an anticipated investment of \$ 1824 billion. It is wholly sponsored by the Central Government, 50% of the cess<sup>1</sup> on High Speed Diesel (HSD) is earmarked for this programme. Like the other two great highways projects, PMGSY is also lagging behind its schedule. The target originally set for the new connectivity was to provide connectivity to 56,638 habitations, but by quantitative estimates physically only 27,303 habitations have been allowed access, as on October, 2006. The figure shows that only 15.8 % of habitations have been actually connected so far, and the project is already behind the target, which was set for the end of 10<sup>th</sup> FYP period [112]. Figure 3.1.9 and Figure 3.1.10 present a clear picture of percentage of rural habitation in States not connected by roads and population category-wise connectivity of villages at the All India level respectively. The graph conveys a very high state of regional imbalance in the road infrastructure in the country.

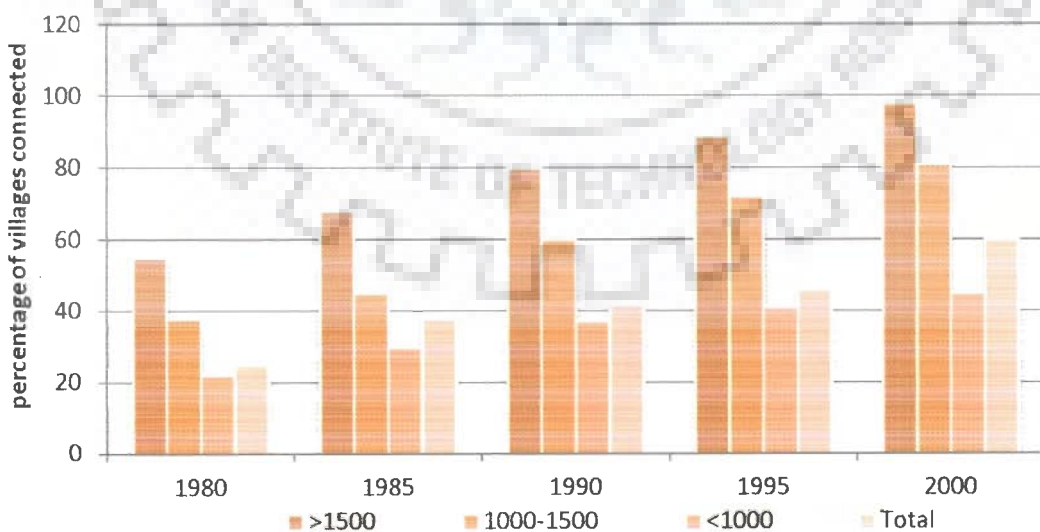
The present analysis clearly indicates that there exists a huge gap in the required road infrastructure and available road facilities in the country. The Government and policy makers in the country has pointed to the lack of funds for adequately developing this sector in India, especially National and State highways. In the next section a detailed analysis is done about the road sector financing in India.

**Figure 3.1.9: Percentage of Habitations in States not connected by Road (2008)**



Source: Ministry of Rural Development, Government of India (2008)

**Figure 3.1.10: Population Category-Wise Connectivity Status**



Source: Ministry of Rural Development, Government of India (2008); 11<sup>th</sup> Plan document, Rural Roads Report, Planning Commission, India.



### 3.1.3 FINANCING IN ROAD INFRASTRUCTURE IN INDIA

This section will review the existing pattern of Government funding related to the road sector in India and provides the necessary basis for assessing the need for restructuring the approach to the financing of this sector.

Funding Pattern of Road sector in India is as follows

- A. Budgetary support – Central and State Governments.
- B. Lending from International Agencies- WB, ADB, JBIC, OECD.
- C. Central Road Fund- a dedicated fund created through levy of cess on fuel.

India has a well established federal system under which the Central, States and Local Authorities have well defined powers for management of the various modes of transport. National Highways, come under the purview of Central Government and the responsibility for the rest of the roads is vested in the State Governments. Both Central and State Governments impose taxes on vehicle purchase, vehicle ownership and vehicle use. The Central Government earns revenue by levying excise duty on fuel, cess on fuel, excise duty on motor vehicles, excise duty on tyres, and excise duty on motor parts. Similarly, the State Governments also generate revenue from the road sector by levying sales tax on fuel, sales tax on motor vehicles, sales tax on tyres, sales tax on motor parts, and road taxes on vehicles (excluding customs duties). However, only one-third of revenue generated from roads is returned to this sector as investment for the construction and maintenance of roads (*World Bank, 2004*).

Now let us consider Highways sector financing exclusively:

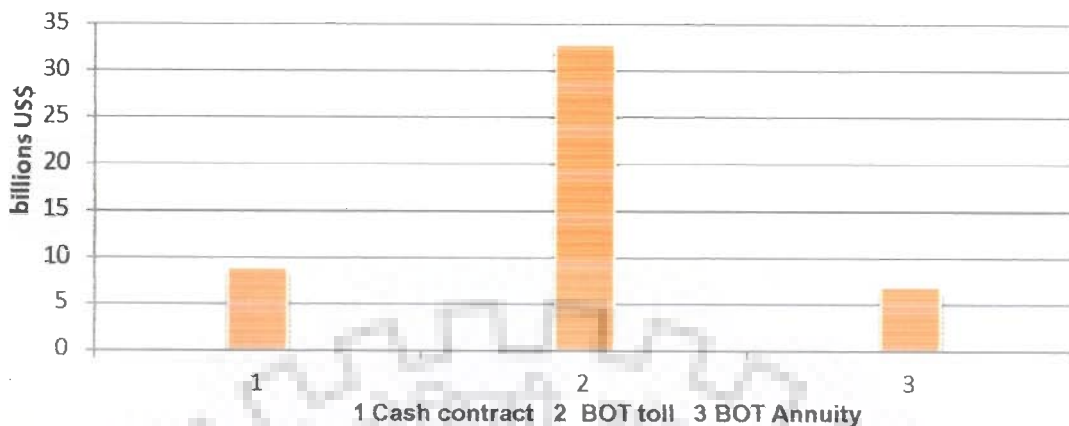
- A. Budgetary support
  - a. Normal
  - b. Dedicated Fund (Cess on fuel)
- B. Lending from International Institutions - WB, ADB, JBIC.
- C. Public- Private partnership
  - a. Build Operate and Transfer (BOT)- Investment by private firms and return through user fee
  - b. BOT (Annuity) – Investment by private firms and return through annual payment as per bid to be made by the private firm to the Government.

- c. Special Purpose Vehicles (SPVs) – with equity participation by National Highway Authority of India (NHAI).
- d. Market Borrowings.

The broad funding pattern of NHDP is provided in the subsequent section. As discussed earlier, NHDP is being implemented in seven phases. The total road length to be covered is 45,974 kms, and the funds required are US \$ 48.88 billion. The category-wise estimated break up of funding pattern is given in Figure 3.1.11. The information gathered from the graph clearly conveys that to construct roads under NHDP, the Government has dedicated itself entirely to the PPP route. It aims to execute the major section of NHDP through BOT (Toll) arrangements followed by Cash contracts and BOT (Annuity) arrangements.

The basis of awarding road contracts under cash contracts, BOT Toll and Annuity depends upon the risk and return relationship. The high-density stretches with more assured returns are normally awarded under toll concessions, while SPVs and annuity concessions are used for projects that have higher traffic risks.

Vision 2021 for Road sector development in India sets out physical and financial targets for highways development. In broad terms, the investment needs of the Expressways (3000 km), National Highways, and State Highways, in the ten year period (2001 – 2011), are estimated at Rs.300, Rs.1,200 and Rs.750 billion respectively, which comes out to the total of almost over Rs. 2 trillion or it may be said that Rs 225 billion will be required additionally for this purpose, if evenly distributed over ten year tenure. Table 3.1.4 gives the detailed break-up of road sector investment needs in India. The researcher also studied the road sector investment requirements for 11 FYP in India and a comparative assessment is done with the investment in 10 FYP (Table 3.1.5 & Figure 3.1.12). It is evident that Government has embarked on ambitious investment initiative for road sector in the 11<sup>th</sup> FYP, but the picture is still very gloomy in terms of what is committed and what is awarded (Figure 3.1.13).

**Figure 3.1.11: Category-wise break up of NHDP financing**

Source: Department of Road Transport & Highways, India

**Table 3.1.4: Road Sector Investment requirement: 2001-02 to 2010-2011 in billions of Rupees**

S.No.	Category	Km	Investment
1.	National Highways	61000	1200
2.	Expressway	3000	300
3.	State Highway	78000	750
4.	Major District	100000	400
5.	Village Roads		3970

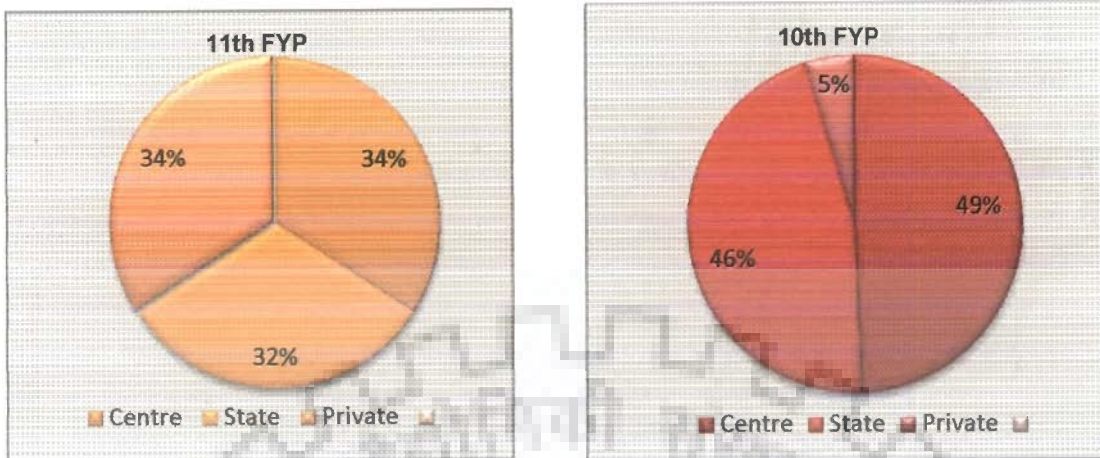
Source: Indian Road Congress, Road Development Plan: Vision 2021

**Table 3.1.5: Road Sector Financing needs for 11<sup>th</sup> FYP a comparative assessment with 10<sup>th</sup> FYP (in billions of Rs)**

		10 FYP	11 FYP	% increase
1.	Central Government finance (includes Bharat Nirman & NE Road finance)	715.34	1073.59	50.1%
2	State Government finance	663.54	1000.00	50.7%
3.	Private sector finance	70.04	1067.92	1424.7%
4	<b>Total</b>	1448.92	3141.51	116.8%

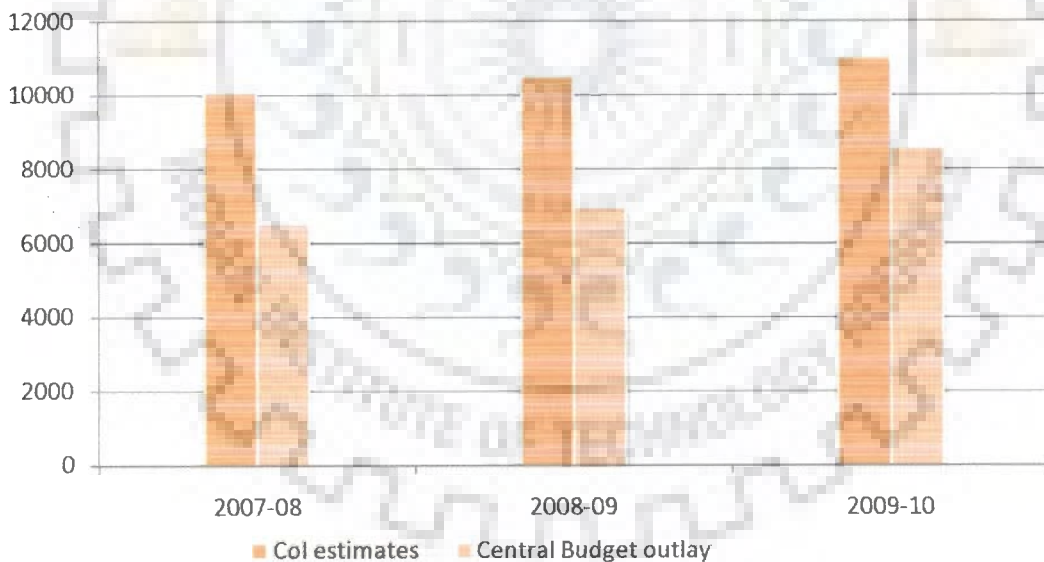
Source: "Projections in the Eleventh Five Year Plan: Investment in Infrastructure", Committee on Infrastructure, Planning Commission India.

**Figure 3.1.12: Investment in Road Sector 11<sup>th</sup> FYP & 10<sup>th</sup> FYP**



Source: Col estimates - "Projections in the Eleventh Five Year Plan: Investment in Infrastructure", Committee on Infrastructure, Planning Commission India

**Figure 3.1.13: Estimated NHDP Investment Required versus Actual Outlay- 2007-2009**



Source: Central Budget outlay- Union Budget, GOI - 2007-08, 2008-09, 2009-2010.

In broad terms, the investment needs of the National Highways and State Highways, in the ten year period (2001 – 2011), are estimated at Rs.1200 and Rs.750 billion respectively, which comes to the total of Rs. 1950 billion. It may be said that Rs 195 billion will be required additionally for this purpose, if evenly distributed over ten years tenure. The overall Government allocation of funds for

two sub sectors of highways sector in annual plan 2009-10 works out to Rs. 101.08 billion<sup>2</sup>. However, as discussed earlier, Rs 195 billion annually is required for the development of additional highways to achieve the targets set for the year 2011 under Vision 2021 programme for road sector development in the country. A comparative analysis of the estimated investment in NHDP by the Central Government as worked out by the Committee on Infrastructure in document “Projections in the Eleventh FYP Investment in Infrastructure” with the actual Central Government outlay in Union Budgets for the project clearly highlights the financing constraints in the sector (Figure 3.1.13).

### 3.1.4 CONCLUSION

It is already highlighted that there exists a big void in terms of available road services and the required finances to foster growth in India. As stated earlier, highways are the backbone of industry, and so a good investment in this sector is likely to decrease the travel time appreciably, increase the truck speed to match with world standards and decrease congestions on roads. However, looking at the fiscal position of the country it is erroneous to ask for increased budgetary allocation for this sector. On the contrary, looking at the success of private participation in a few projects in the highway sector- (Jaipur to Kishangarh section of NH-8, it is a BOT project and was completed five months ahead of schedule), it will be most appropriate to advocate for an increased participation of private sector in road development. The main advantages of private sector are that they are considered to be more efficient and this way the Government can reduce the direct burden on public purse for borrowing requirements to pursue infrastructure development.

Private participation can be tapped in a variety of ways. It can be domestic participation, or foreign, or both; further, it can be in the form of equity or debt. The common forms of PPPs, usually practiced in the road sector, are:

- A. Build- Finance-Operate (DBFO)
- B. Build-Operate-Transfer (Toll)
- C. Build- Operate- Transfer (Annuity)

In India presently the road sector development takes place mainly through three models: BOT (toll), BOT (annuity) and Engineering Procurement Contracts

(EPC). It is already highlighted that to boost road sector development in India a lot of private investment is needed. Much of this financing is expected to come through PPP route. However, the amount expected to be realized through private sector participation in the 11th FYP is enormous and it is unlikely to be achieved simply by domestic private operators. A study conducted on Indian road sector found that despite good enabling environment in the institutional framework, and massive investment opportunity in the Sector, the private investment including FDI is not up to the expected level [130]. FDI has a significant role to play in the funding of this sector in India, as it is not a debt liability but comes in the form of equity which cannot be immediately withdrawn and which also does provides access to world class technology. It is important for the Government to tap this source of funding in order to develop the roads and highways sector.

#### ENDNOTES

<sup>1</sup> The cess is a sort of surcharge which is levied on the tax. For example, one liter of diesel which costs Rs 25 [\$ 0.58 (per \$ rate taken here is 43 rupees)] in India and Sales tax on that works out to be Rs 5 [\$ 0.12 (@ 20 per cent)]. Then, over and above this tax amount of Rs 5, a cess (suppose @ 3 per cent of the tax amount) will be further added. So, the final price of one liter of diesel will be  $\text{Rs. } 25 + 5 + 0.15 = \text{Rs. } 30.15$  or (\$ 0.70). Generally the rate of cess remains very less as compared to the rate of tax and it is levied on the amount of tax and not on the basic price of the product

<sup>2</sup> The finance requirements as calculated for National highways include the two components – Fund requirements for Border Road development and NHDP. The State highways requirement is taken as one required for the development under Special Programme for development of road connectivity (National Highways & State Roads) in Naxal affected areas and/or Inter-State and Economically Important Roads in different States and UTs. The source of calculation is the Union Budget 2009-10 document of the Government of India.

## **SECTION B: INDIAN POWER SECTOR**

### **3.2.1 INTRODUCTION: AN OVERVIEW OF INDIAN POWER SECTOR**

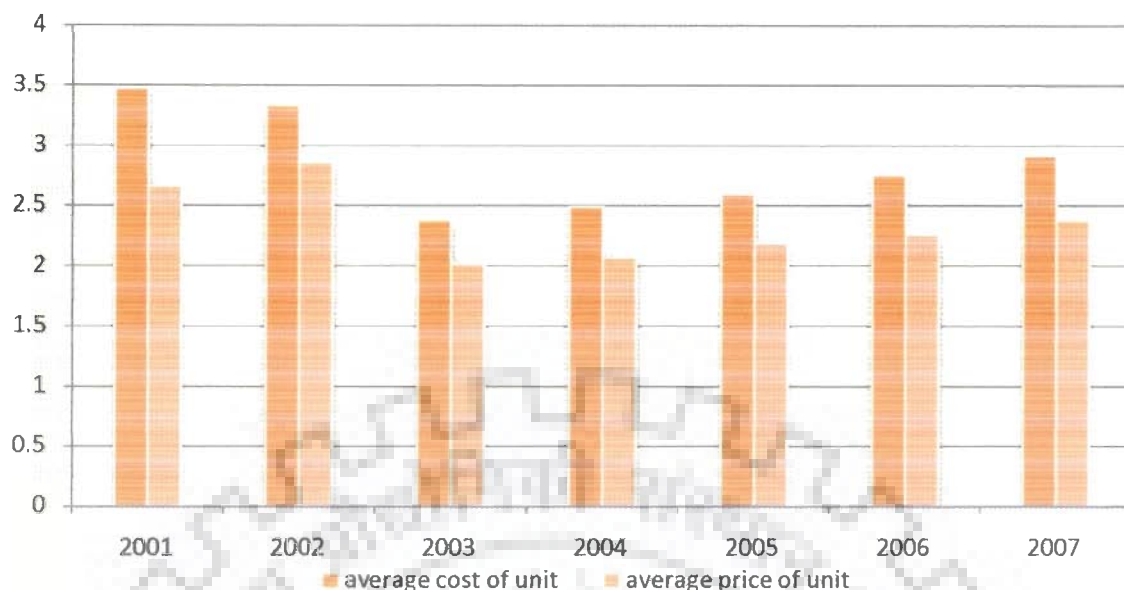
The power sector is the most capital-intensive sector as it requires heavy investment in terms of production installation, transmission and distribution networks. Also, it is one of the imperative sources to support an economy's growth. Its usage is versatile industry wise. It lies in the concurrent list of the Indian Constitution, with both Center and State Governments having control over it. Under the Central Government, the Ministry of Power (MoP) is responsible for overseeing India's electricity industry. Central Electricity Authority (CEA) is another agency that works under the MoP and assists it in technical and economic matters and is also responsible for giving various clearances to the State-level generation and supply undertakings. At the State level, Power Ministry is responsible for the management and control of power sector. Under the power sector reforms process and as directed by multilateral funding agencies like ADB and World Bank, Electricity Commissions at the Central and State levels have emerged as powerful institutions. The role of these commissions is basically that of a regulator and, they do keep a check on cost and price economics of various electricity-generating and selling organizations in the country. In contrast to this heavy departmental and ministerial organization of the power sector in India both at the Center and State level, the power structure in China is relatively simplified, and efforts have been made to minimize the various levels of hierarchy in order to achieve ease of operation and to avoid overlapping of roles. Initially, every province had its own power bureaus which maintained the power utilities and operations in its region. There were State Power Corporations (SPCs) in each province, these SPCs had control over 46% of the generation and almost 90% of the supply, and the rest were under the Central administration. However, these SPCs were dismantled by the China's State Council in December 2002 and 11 smaller companies were established. The smaller companies include 2 electric power grid operators, 5 electric power generation companies and 4 relevant business companies. Each of the 5 electric power generation companies owns less than 20% (32 GW of electricity generation capacity) of China's market share for electric power generation. Ongoing reforms aim to separate power plants from

power-supply networks, privatize a significant amount of state-owned property, encourage competition, and revamp pricing mechanisms. Pricing mechanism is an important measure to assess the cost and price economics of any sector which is indicative of the sustainability and profitability of that sector. As such an assessment of this factor is vital to the framing of an overall picture of the industry.

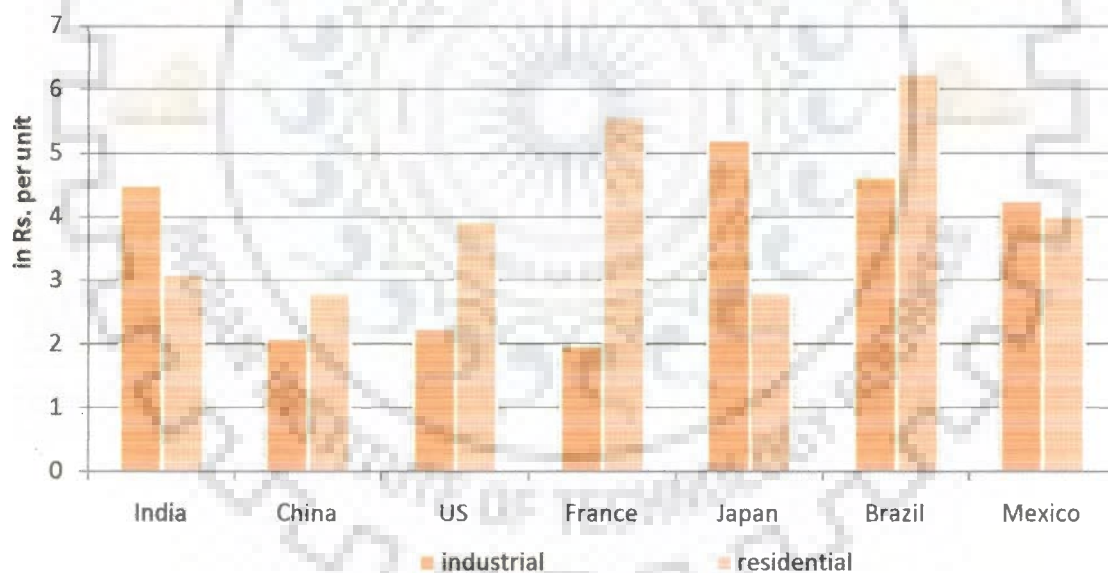
The cost economics of this sector in India presents a gloomy picture. On an average for the period 2001-05, the recovery from the sale of electricity was Rs 2.37 per unit. However, the average cost was Rs 2.86 per unit, thus causing a loss of Rs.0.49 per unit (Fig 3.2.1). Apart from this, the rate of cost-recovery also varies across the country. While the states like Assam, Bihar and Jammu Kashmir account for the lowest recovery rates, Tamil Nadu and Maharashtra account for more than 90% of recovery rates. The aggregate cash losses for all the State Electricity Boards (SEBs) increased from Rs. 68.68 billion in 2006-07 to Rs. 77.77 billion in the year 2007-08 (*PFC, 2009*). But the irony is that despite these losses the tariff structure in India is one of the highest in the world. Figure 3.2.2 provides a comparative view of the industrial and residential electricity tariff of a few world economies.

The other interesting trend conveyed by the graph is that unlike in India, in most of the economies, the residential tariff is apparently higher than the industrial tariff. One important cause of this fact is the cross-subsidy based tariff structuring that heavily subsidizes agriculture and domestic consumers in India at the cost of industrial and commercial consumers who pay almost twice the average price. The other important and interesting fact is that approximately half of the electricity is unmetered /unbilled in India. All the underlined issues have serious deterrent effects on the electricity sector as well as overall economic growth of the country. Due to the poor growth of power sector the gap between demand and supply of power has widened over the years affecting industrial and economic growth of the economy.



**Figure 3.2.1: Electricity Average Unit Cost Versus Unit Price - India**

**Source:** Report on Performance of State Power Utilities 2005-06 to 2007-08, Power Finance Corporation (2009), India

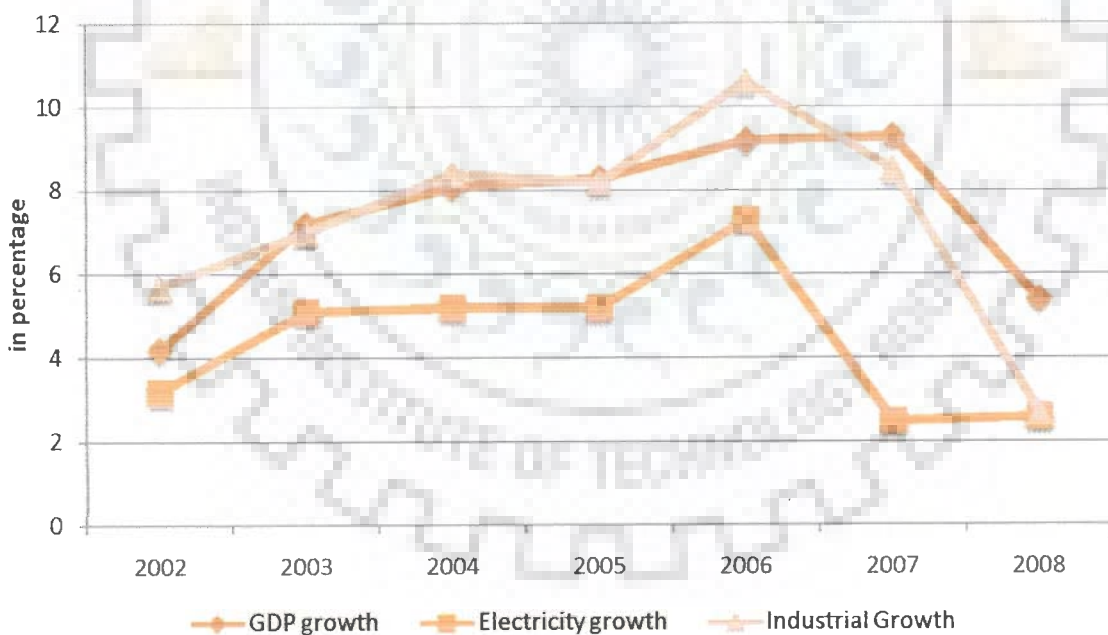
**Figure 3.2.2: Electricity Tariff - Cross Country View**

**Source:** EIA, 2007

Several studies conducted in the past proved that there exists a positive co-relation between the electricity consumption pattern and economic growth of any nation [48]. Eventually, it is apt to say that a high level of economic growth must be complimented by a high level of electricity growth to sustain the growth momentum. However, if we examine the India's case, it is revealed that the electricity growth pattern does not follow the economic growth pattern in the country. Figure 3.2.3 exhibits a sharp gap between the trend of electricity growth

and the industrial and manufacturing growth over the period 2001-2006 in India. On the contrary, the electricity growth rate in China far outpaced the growth in the other sectors and, as such worked as a catalyst in accelerating the economic growth (Fig 3.2.4). The Electricity-GDP elasticity and the Electricity-Industrial elasticity for India have been well below unity for the last six years (Fig 3.2.5), while for China the two types of elasticity are well above unity except for the year 2008, which is possibly the outcome of slow electricity production due to global financial meltdown (Fig 3.2.6). This conveys that the current pattern of growth in the sector in India is not sufficient enough to sustain the overall economic and industrial growth in the country. This poor electricity elasticity disturbs the equilibrium between demand and supply of electricity in the country. The demand which is continuously rising with the increasing population and industrial and economic development has not been complemented by increased supply.

**Figure 3.2.3: Electricity Growth versus Industrial & GDP: India**



**Source:** Ministry of Statistics and Programme Implementation, India; [http://mospi.nic.in/mospi\\_iip.htm](http://mospi.nic.in/mospi_iip.htm)

Figure 3.2.4: Electricity Growth versus Industrial &amp; GDP: China

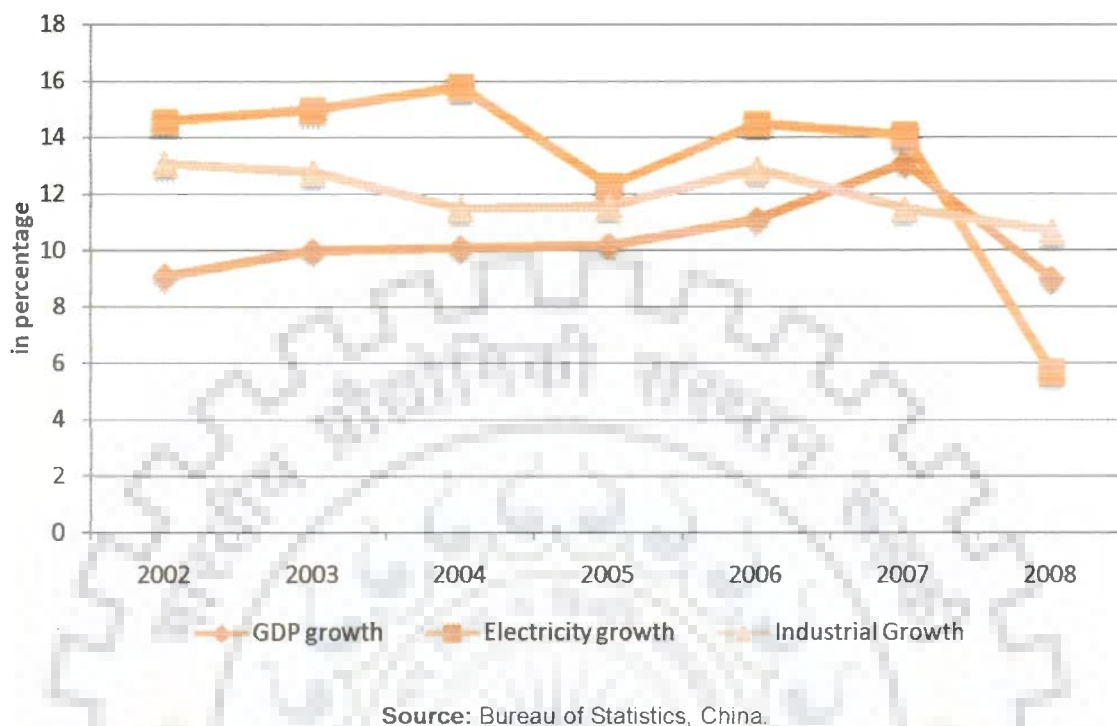
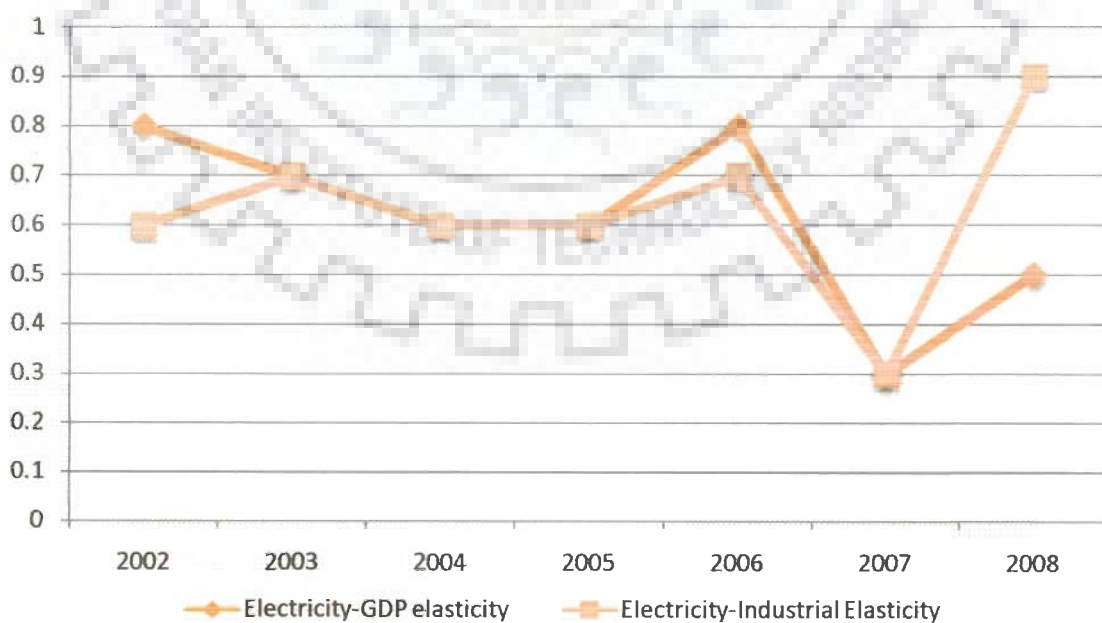
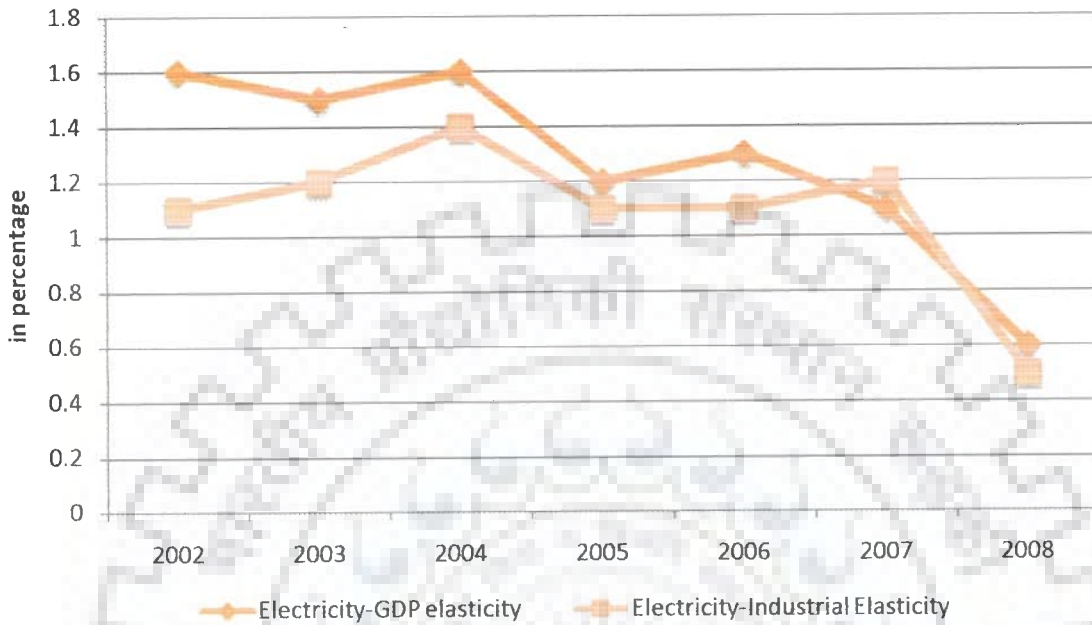


Figure 3.2.5: Electricity- GDP Elasticity &amp; Electricity-Industrial Elasticity: India



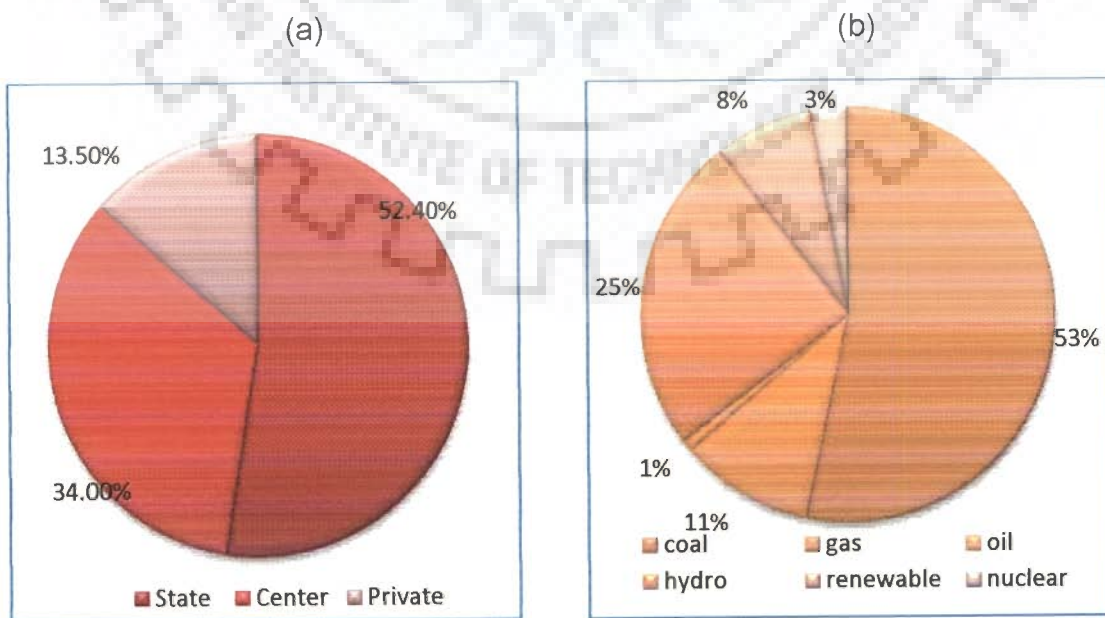
Source: Author's calculation based on data from Economic Survey India

**Figure 3.2.6: Electricity- GDP Elasticity & Electricity-Industrial Elasticity: China**



Source: Author's calculation based on data from Bureau of Statistics, China.

**Figure 3.2.7: Indian Electricity Generation Status**



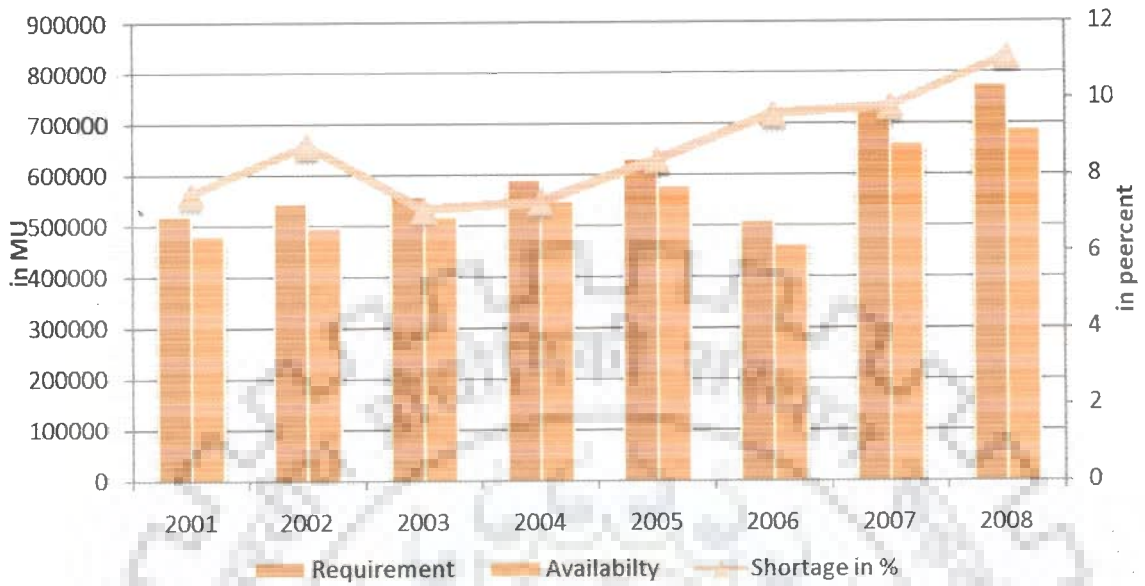
Source: Ministry of Power, India

### 3.2.2 PHYSICAL STATUS: a comparative view - gaps and requirements

In Indian set up public sector units have played a dominant role in the electricity generation and supply since independence. SEBs control 60% of generation activity, while Central Undertakings, National Thermal Power Corporation Ltd.(NTPCL) and National Power Corporation of India Limited (NPCIL) control almost one third of the generation capacity, and the rest is being under private development [Fig-3.2.7(a)]. SEBs controls the majority of all the intrastate distribution system and 70% of transmission. In terms of generation structure, Indian power sector relies heavily on coal-based thermal power plants and very little reliance is on nuclear and renewable power generation [Figure 3.2.7 (b)].

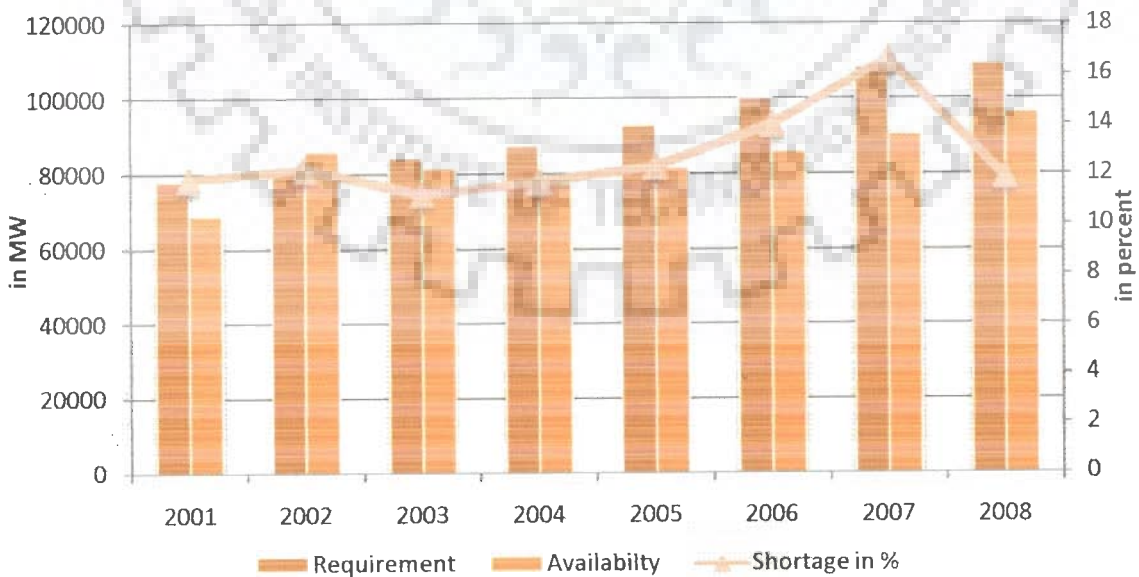
India's electricity demand has increased significantly over the past two decades owing to the rapid economic growth in the post-liberalization era. In the 60s the per capita consumption of electricity was around 150 units for India, but recently this figure has touched a mark of about 325 units. As a consequence, the energy demand for this sector has also increased manifold. The 16<sup>th</sup> Electric power survey assumes that by the year 2030, the demand for energy will be 400,000 MW at the level of 1.4 billion populations which requires an energy growth rate of 5% per annum. However, as per the annual report of the MoP, India presents a very gloomy picture of achieving this target. It gives the statistics for required and available electrical energy (Figure 3.2.8) and peak hours power demand and supply over the last five years (Figure. 3.2.9). According to this document, on an average there is an increase of 4% in electrical energy supply, but despite this the shortage in power supply is increasing continuously in the last few years. Apart from the widening gap in demand-supply, there is another major problem of incessant supply. Almost 60% of the industrial sector in India is forced to develop back up private generation facilities to combat this irregularity in electricity supply [169]. Further, an analysis of 10<sup>th</sup> FYP performance in the power sector revealed that India was not able to achieve the targeted capacity addition in any of the three sectors- Centre, State and Private (Figure 3.2.10). Approximately only 50% of the targeted addition was achieved in all the three categories. Quantitative data given in the following part verifies this fact where India's installed capacity; power production and consumption are much below as compared to other economies.

Figure 3.2.8: Power Scenario - Demand-Supply



Source: Annual Report 2008-09, Ministry of Power India

Figure 3.2.9: Power Peak Hours: Demand-Supply



Source: Annual Report 2008-09, Ministry of Power India

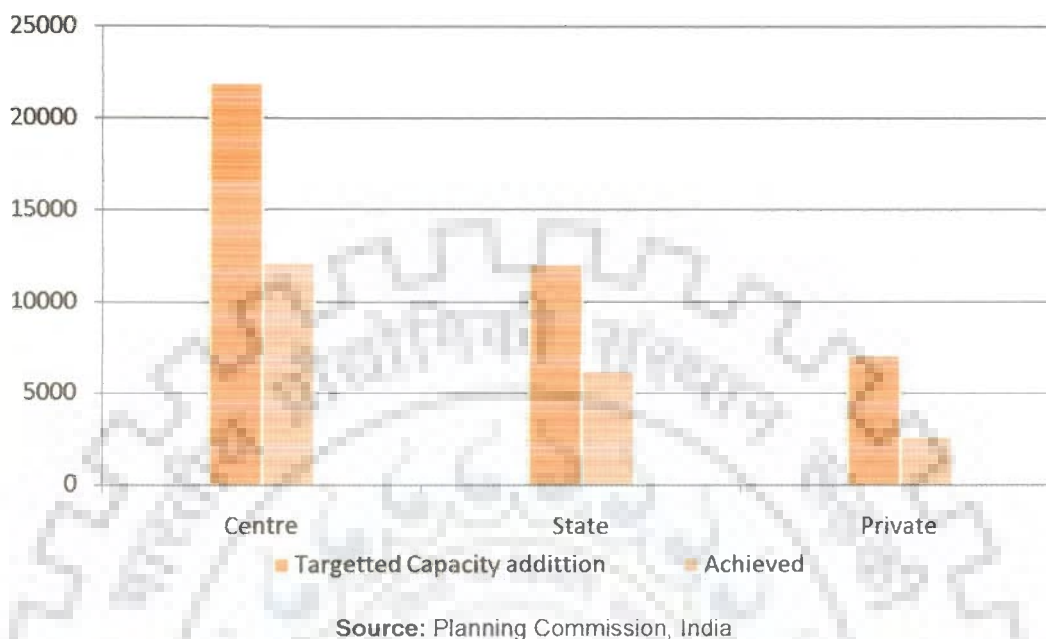
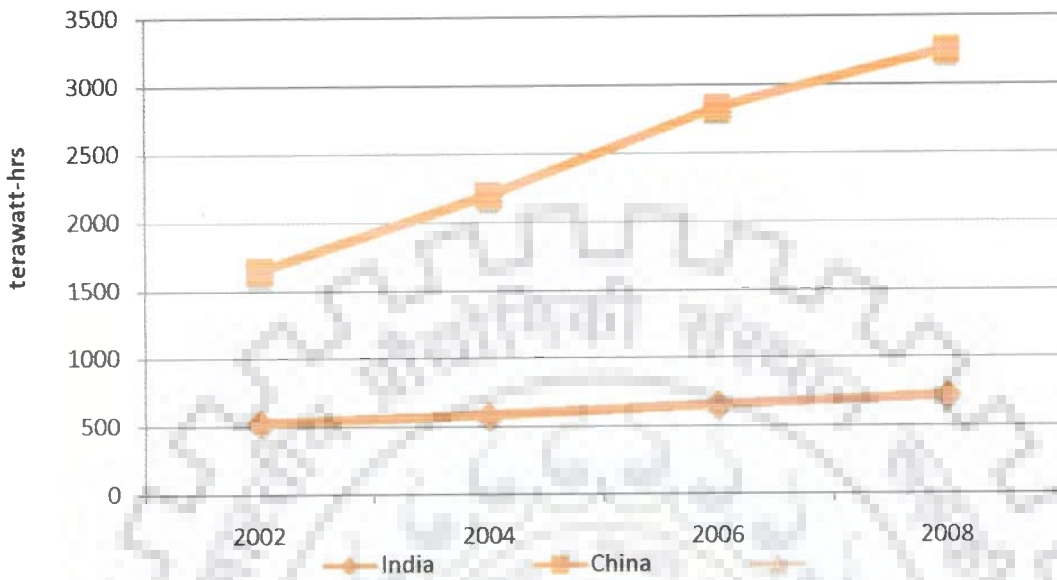
Figure 3.2.10: 10<sup>th</sup> FYP capacity addition target versus achievement

Table 3.2.1: A Cross-Country Overview of Electricity Sector

	India	Brazil	China
<b>Electricity Installed Capacity</b>	137.578 gigawatt [5]	90.733 gigawatt [9]	442.380 gigawatt [2]
<b>Electricity Production</b>	661.64 billion kilowatt hr [5]	396.36 billion kilowatt hr [9]	2371.83 billion kilowatt hr [2]
<b>Electricity Consumption</b>	488.53 billion kilowatt hr [7]	368.53 billion kilowatt hr [9]	2197.11 billion kilowatt hr [2]

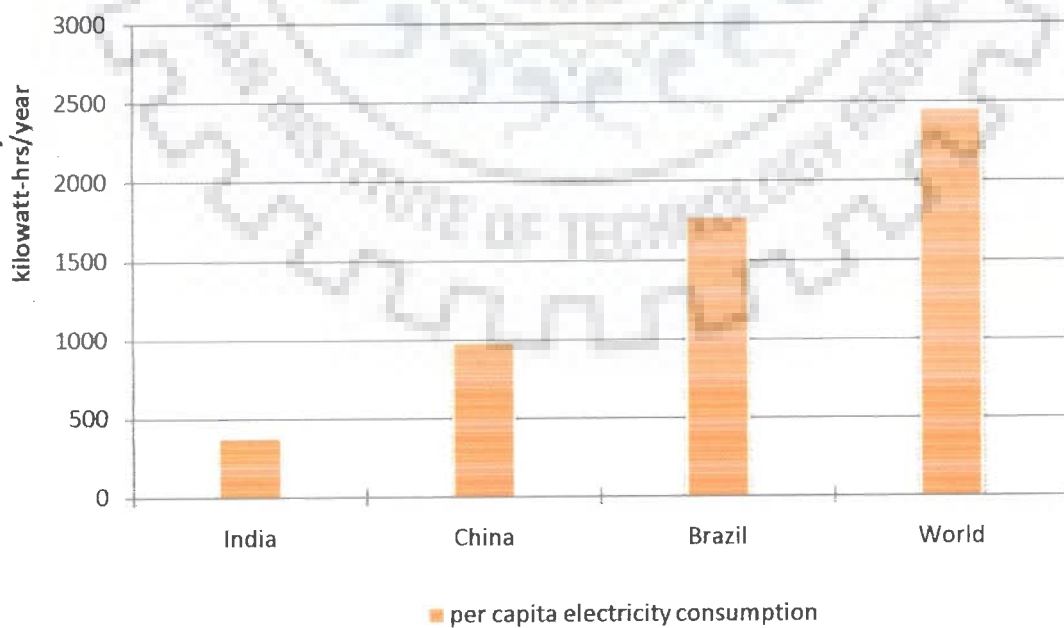
Source: Energy Information Administration, US Government. [China & Brazil 2006, India 2005; Numerals in parenthesis indicate the World Rank]

**Figure 3.2.11: Electricity Generation Capacity: India & China**



Source: India – Ministry of Power, Annual Report 2008-09; Bureau of Statistics, China

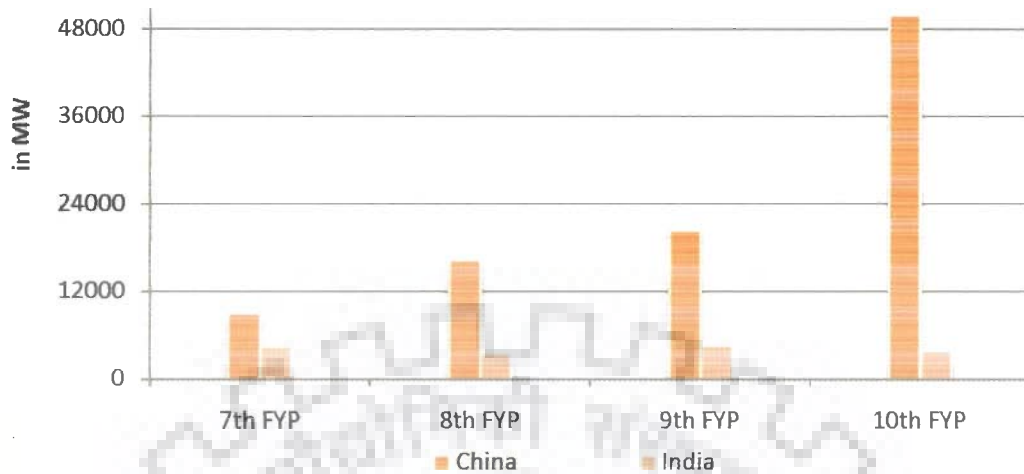
**Figure 3.2.12: Per Capita Electricity Consumption & Access**



Source: BP Statistical Review of World Energy 2008



**Figure 3.2.13: Average Annual Capacity Addition India & China: 7<sup>th</sup> FYP to 10<sup>th</sup> FYP Period**



**Source:** Author's calculation based upon data from Bureau of Statistics China, Economic survey India various years

### Quantitative Comparison with Other Economies

China is the second largest generator as well as consumer of electricity in the world, after US, while India has the fifth largest generation capacity and its transmission and distribution network stands third largest in the world (*Investment Commission, India, www.investmentcommission.in/power.htm*). Table 3.2.1 provides the comparative data pertaining to electricity sector for both nations along with Brazil. China has really been able to enhance power generation significantly as compared to India in the past few years, as depicted in the figure 3.2.11. Further, the per capita electricity consumption in India is one of the lowest in the world, while the world average stands at 2456 kwh, for India it is 613 kwh (Figure 3.2.12). Further, if we look at Figure 3.2.13 about average annual capacity addition, India's performance during the period of last four FYPs is no where comparable to that of China. It reveals very interesting data about the capacity addition as it is clear from the graph. The generation capacity that India added in the whole of 10<sup>th</sup> FYP (20000 MW), China has added more than twice of that capacity annually (50000 MW) during the same period.

One important reason for this is the greater reform processes and a systematic approach towards realization of targets in China. The Chinese approach of separating generation system entirely from transmission and

distribution, is a step towards avoiding the overlapping of authorities among different institutions and making the entry and exit for private investors an easier process. In such a system there are just 11 companies to perform all the functions – 5 in generation, 2 in transmission and distribution and 4 in business units, in public sector over the entire country. While in India 27 SEBs and many other Central and State level companies and organizations are involved in the overall process, making things more complicated.

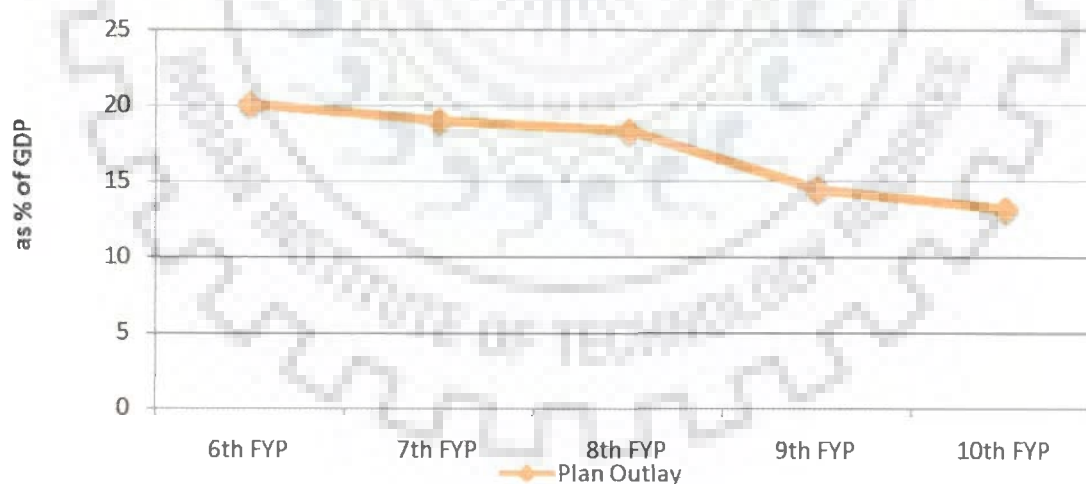
The important indicators presented in the previous part like cost and price economics, electricity growth, demand-supply scenario and many more pose challenges pertaining to the power sector growth in the country. These arise not only from the supply shortage, erratic supply and high tariff rates as discussed earlier but are also related to the poor plant load factor, unmettering, power thefts, transmission and distribution losses and utility specific preferences and subsidies. Unlike in the developed world, the power tariffs for the domestic and agricultural sector in India are lower than for the industrial and commercial utilities. The agricultural sector accounts for 25% of the power consumption; however, the rate of recovery from this sector is just 6.48% for the year 2005-06 [110].

The technical and commercial losses are also very high, and on an average stands at around 34% for the period 2002-06 (MoP, India, 2007, [http://powermin.nic.in/generation/cea\\_month.htm](http://powermin.nic.in/generation/cea_month.htm)). The poor commercial performance and bankruptcy of SEBs is a major cause of concern for the power industry today. The power politics in India is one main reason behind the negative rate of return of the State Power Undertakings. The vote politics deter the Government from including the agricultural community in the tariff network. Apart from this the State Boards have high dependency on the budgetary allocations from the Government, which is always far short of the requirements. These organizations fail to raise money from the market due to their poor financial performance, and as a consequence their performance falls short of achieving the set targets of capacity enhancement as has been experienced in the last few FYPs. Looking at this state of affairs, the task of identifying the remedial measures is the need of the day, and Government must endeavor to look for viable alternatives. Beginning, with the correcting of cost-price relationship, it should move on to correcting the problem of unmettering, minimizing subsidies and many such others.

### 3.2.3 POWER SECTOR FINANCING

Infrastructure investment needs of Power sector are indeed huge, and time and again it has been highlighted that the expected rate of Government spending, i.e., about 2.14% of GDP annually<sup>i</sup> is not sufficient enough to cater to the growing demand of this sector. It will be instructive here to first review the plan-wise contribution towards the development of the electricity sector in India<sup>ii</sup>. On an average the plan wise outlay for this sector is 17% for the last FYPs; however, the contribution of this sector to the overall GDP is on an average 2% for the period 2001-06 (Mospi, 2008). The percentage outlay in this sector has been on a continuous decline since post independence years. It came down from around 20% in 6<sup>th</sup> FYP to about 13% in 10<sup>th</sup> FYP (Figure 3.2.14). This decline has resulted in the shortage of funds for the electricity sector which is in dire need of expansion and maintenance of the existing facilities. In the pre-liberalization era private investment in the power sector was absent, but the post liberalization period witnessed private equity in this sector.

**Figure 3.2.14: Plan Wise Outlay: Power Sector - 6<sup>th</sup> FYP to 10<sup>th</sup> FYP Period**



Source: Various FYP – Planning Commission, GoI.

It will be interesting here to analyse the funding pattern for power sector in the 10<sup>th</sup> and 11<sup>th</sup> FYP. The overall estimate for the expected investment has increased by almost 3.5 times in 11<sup>th</sup> plan as compared to 10<sup>th</sup> plan (Table 3.2.2). The private sector investment is also estimated to be high for the 11<sup>th</sup> FYP. On an average the annual expected private investment in this sector is Rs. 37102 crores.

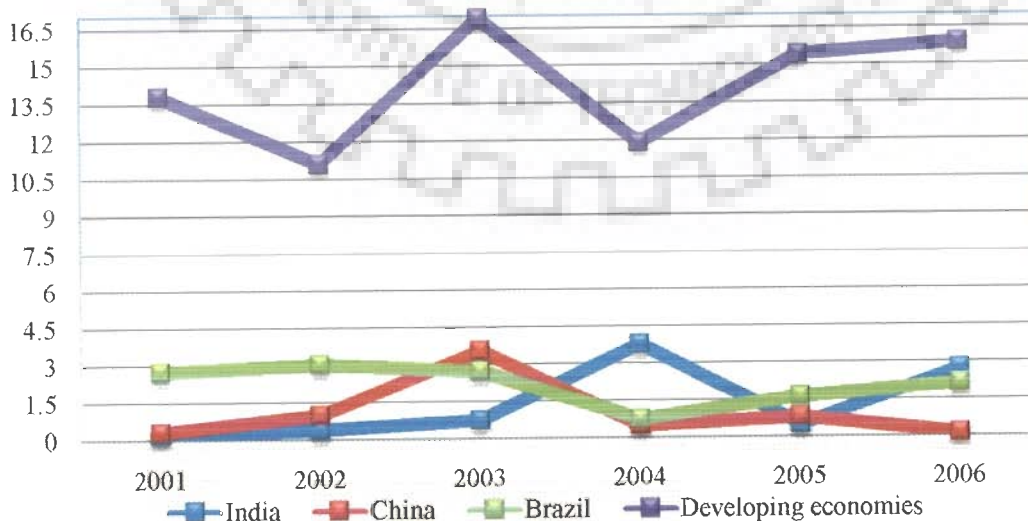
However, on studying the data of private sector investment in this sector during 2001-06, it is found that the average annual flow is around Rs. 610 crore<sup>iii</sup> (Figure 3.2.15)

**Table 3.2.2: Power Sector Financing needs for 11<sup>th</sup> FYP a comparative assessment with 10<sup>th</sup> FYP (in billions of Rs)**

S. No.		10 FYP	11 FYP	% increase
1.	Central Government finance	1024.63	2553.16	149%
2.	State Government finance	975.53	2256.97	131%
3.	Private sector finance	918.34	1855.12	102%
4.	Total	2918.50	6665.25	128%

Source: "Projections in the Eleventh Five Year Plan: Investment in Infrastructure", Committee on Infrastructure, Planning Commission India.

**Figure 3.2.15: Private Participation in the Electricity Sector: India, China, Brazil & Developing Economies (in US \$ billions)**



Source: World Bank PPI Database 2007.

### 3.2.4 CONCLUSION

Private participation in the Indian electricity market is in a very nascent stage. The reforms process in the Indian power sector started as early as 1991, and still the private sector participation is almost negligible. The failure of Dabhol Power Project (carried on by Enron Power Corporation) was one major reason for withdrawal by the erstwhile interested foreign and domestic private players from investing in this sector. Unlike, the U.S electricity market Indian electricity market is mainly dominated by the Public sector and the State Boards in all the three main segments- generation, transmission and distribution, as discussed earlier. If we analyze the performance of the private sector in the Indian power sector, in generation the share of private sector is 12.9%, and in transmission only two deals so far have been finalized with two Indian companies namely, Tata Power and Reliance Energy. The pattern of private participation in India is mainly dominated by the Greenfield Ventures. Figure 3.2.15 provides a cross-country view of private participation in the electricity sector. It is noticed that private participation in the Indian electricity market has been usually very low as compared to that in other economies, the only exception being the year 2004 and 2006. In private participation itself the share of FDI works out to be negligible, as in previous years no major foreign deals are witnessed in this sector in the country. The present evaluation suggests that India will have to make rigorous policy and institutional arrangements to gear up the required investment in this sector. With regard to the growth and development of power sector in India, the major challenge is to provide favorable investment climate to suit the investors needs and to provide affordable electricity to each and every household in the industry in the country.

### Endnotes

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<sup>1</sup> The present expected rate of spending on power sector is calculated on the basis of the Eleventh Five Year Plan estimates of GDP and power sector spending. For data refer the report titled "Infrastructure Investment in India" available at website <http://infrastructure.gov.in/>

<sup>i</sup> The percentage outlay as mentioned depicts the budgetary allocation to the sector. It is calculated as percentage of the total budgetary estimates of all the annual plans during one particular Five Year Plan.

<sup>iii</sup> The average figure was calculated by referring to the yearly private sector flow in the power sector in India, as provided by the PPI database of World Bank.



## SECTION C: RAILWAYS IN INDIA

### 3.3.1 PHYSICAL STATISTICS: A COMPARATIVE REVIEW

Indian Railways is one of the oldest railway networks of the world, and also it is the second largest after the Chinese Railways. The first railway system was created in the year 1853 and was bestowed on the country by the British. In terms of the passenger–kilometer (PKM), it is the second busiest, and overall it is the third busiest. The Indian Railways had a combined route kilometres (rkm) of three gauges (broad, meter and narrow) of 53,596 rkm in 1950-51, and it increased to 63,327 rkm in 2008. About 28% of its rail network is electrified. The core activity area of the Indian railways is carrying and transporting passengers and freight. Apart from it, the Indian railways also perform other allied activities, namely, parcel, catering and coach production. In the tenth plan period a lot has been achieved by the Indian railways in terms of efficiency and economic gains, but measuring this success in isolation would not present the real picture of the sector. It is therefore desirable to have a relative assessment of the sector in comparison to that of the other world economies which are always in discussion when Indian infrastructure growth is mentioned. It is instructive here to make comparative investigation with the China, as the Chinese railway network was way behind the Indian railways during the late 40s, that is, the period when India got independence. Since then China has endeavored hard to take its railway network on the top, leaving Indian railway system much behind it. The researcher did also make an effort to compare the railway infrastructure with that of a few other economies, namely, UK and US<sup>1</sup>.

The Chinese railways are one of the largest and busiest in the world today, it carries 25% of the world's total railways workload and one –sixth of the world's operating railways. Table 3.3.1 provides the comprehensive assessment of the Indian and Chinese railways. It is revealed from the table that the amount of freight traffic carried by the Indian railways is almost one fourth of the traffic carried by its Chinese counterpart. However, in the case of passenger traffic the Indian railways carries almost 4.4 times the traffic carried by the Chinese railways but the number of passenger coaches in India is just 1.02 times more than that of Chinese. It is to be noted here that out of 6.2 billion passengers carried, 1.1 billion

are Mumbai suburban passengers. The data highlight the overstressed state of Indian railways; the number of passengers per coach is approximately 13778 in the case of India, while in the case of China it is approximately 3182 (the calculation is based on the data provided in the table 3.3).

**Table 3.3.1: Railways Physical Status – India, China, US and UK**

	Indian Railways	Chinese Railways	UK Railways	US Railways
Route length 1947	53596 route kms of track	27000 route kms of track	NA	NA
Route length 2008	63327 route kms of track	78000 route kms of track	15810 route kms of track	153787 route kms of track
Freight Carried (Billion MT per year)	750	3300	104	1723
Passengers carried (billions/year)	6.2 billion	1.4 billion	1.1 billion	NA
Investment per year (Rs billion)	375	1500	NA	NA
Number of Locomotives	8300	18300	410	23198
Freight Wagons	225000	578000	NA	1290000
Passenger Coaches	45000	44000	10746	
Maximum Speed Freight Trains	100 kms/hr	120 kms/hr		
Maximum Speed Passenger Trains	160 kms/hr	300 kms/hr		
No. of Employees	1422200	1665588	NA	162438

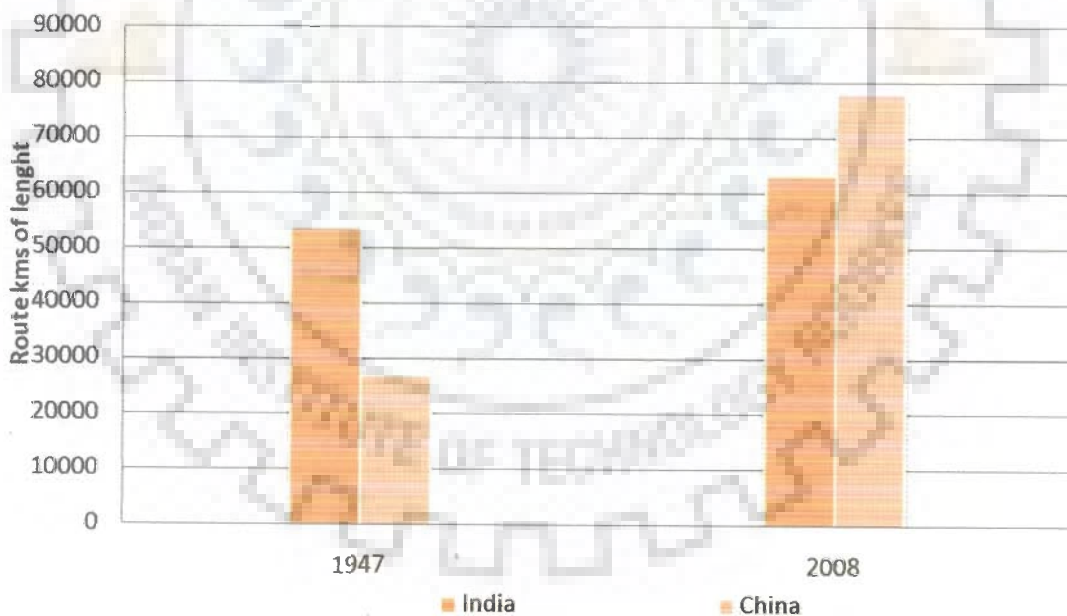
Source: <http://streamlinesupplychain.wordpress.com/2008/12/14/chinese-railways-versus-indian-railways/>;  
ADB, 2008 report on Indian Railway Sector Investment Program

In terms of infrastructure the Indian railways have not been able to create the standards to match its peer country China. This is apparently visible by looking at the figures of the number of locomotives and freight coaches in India. The



numbers of locomotive in China is almost 2.2 times more than that in India and the number of freight wagons is almost 2.4 times more than that in India. Ironically, the Chinese railways were lagging behind the Indian railways in the 1950s. In 1950 the Indian Railways carried 44 billion freight tonne km, against 39 billion in the case of Chinese Railways and Indian railways route length was 53596 route kms of track as against the 27000 route kms of the Chinese track which is almost half of the Indian statistics (Figure 3.3.1). The over stressed state of railways is evident from the fact that the US has 5.8 times more the number of freight wagon as compared to India but it carries only 2.3 times the freight weight of India. This suggests that there is tremendous scope for increasing the number of freight wagons to enable railways to capture the growing goods transportation in India. In terms of electrification India has just 28% of its route electrified, but China has 31%<sup>2</sup>.

**Figure 3.3.1: Railways Length in Route Kms of Length - India and China**



Source: <http://streamlinesupplychain.wordpress.com/2008/12/14/chinese-railways-versus-indian-railways/>

### Institutional Arrangements

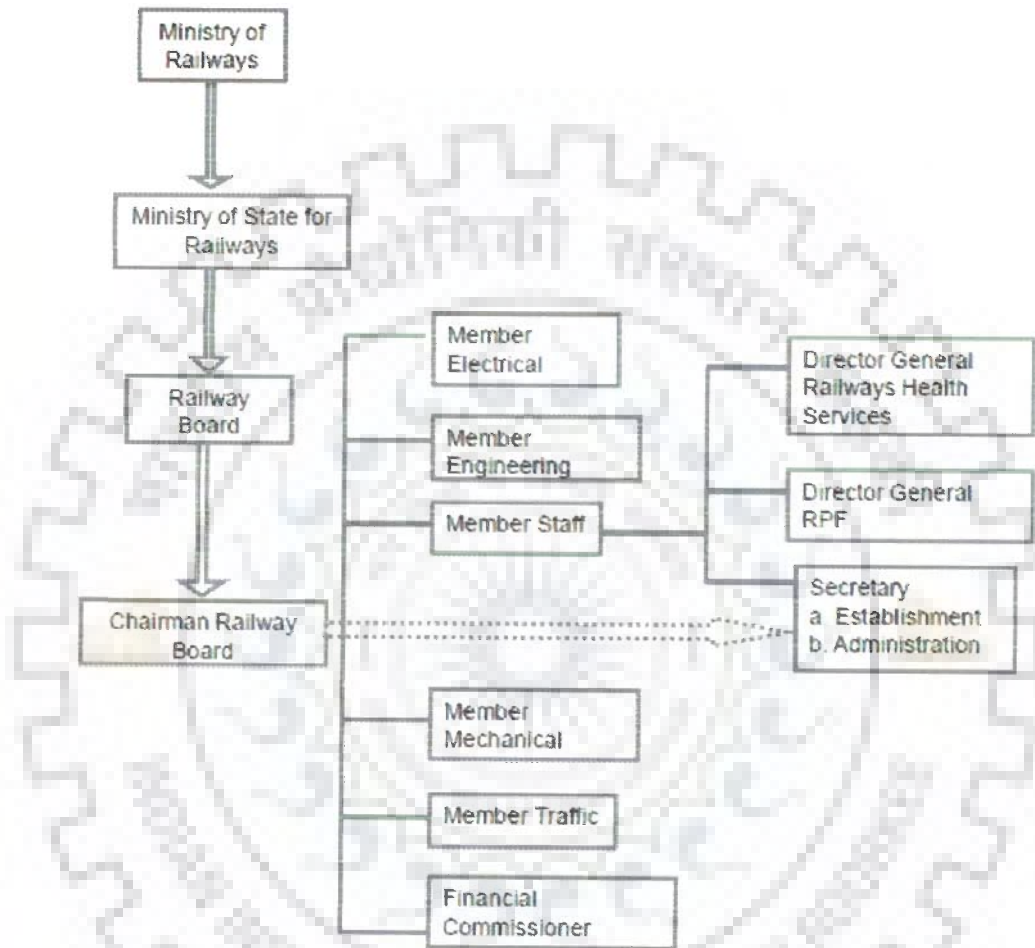
Indian Railways is the biggest State-owned enterprise in the country, and probably India is the only nation in the world where such a large network is operated under a single entity, Ministry of Railways. Railways as a subject fall in

the Central Government list, therefore the Ministry of Railways enjoys the monopoly of rail-transport in India. Railways in India are operated by the guidelines formulated by the Ministry of Railways operated by the federal Government and assisted by Minister of State for Railways. Indian Railway (IR) is the only national railway in the world which runs its exchequer through a separate railways budget<sup>3</sup>. Indian Railway is highly vertically integrated organization with the Ministry of Railways at the top and assisted by the Minister of State for Railways. There is an Indian Railway Board headed by a Chairman and six functional members which assists the Ministers in policy framing and implementation. Administratively, IR is divided into 16 Zones which are further sub divided into 68 divisions. Further, there are 13 Public Sector Units/Corporations, 7 major production units which manufacture electric and diesel locomotives, coaches, EMU/MEMU/DEMU. Apart from these, there are other major organizations, namely, Research Design and Standards Organisation (RDSO), Central Organisation for Railway Electrification (CORE), Metro Railway Kolkata and 6 major training institutes (Figure 3.3.2). The Railway Board supervises the functioning of 16 Zonal Railways, 68 divisions, Railway Production Units, and other units as Railway Staff College, Railways Electrification Unit etc. along with Public Sector Undertakings and Organizations as CONCOR, RITES etc.

In contrast to this relatively elaborate vertically integrated structure of the Indian Railway, the Chinese Railway is broadly divided into two railway group companies. With the Ministry of Railways of the People's Republic of China at the top, there are 16 railway bureaus and 2 railway group companies under the Ministry of Railways. The Ministry of Railways is responsible for the regulation of railways industry and building of railway infrastructure. One group of railway company consists of Transport Enterprises, and the other consists of five major Railway Corporations, one each for rolling stock, railway construction, goods and materials, civil engineering, signaling and telecommunications. These enterprises have been separated from the transport enterprises and made autonomous, but are still state-owned. Apart from this, a number of passenger and freight transport companies have been created to operate on a competitive basis, and further these enterprises are finally regrouped into three to five larger, separate companies. The Federal Government encourages the local authorities to build their own local trains' upto 2000kms and also operate it. This displays significant

shift from the highly vertical and monopolized system of Indian Railways. About 75 of such local railway projects extending to route-length of about 4500 kms are already under operation and 20 more such projects are under execution stage.

**Figure 3.3.2: Organizational Structure Indian Railways**



Source: Ministry of Railways, India

### 3.3.2 RAILWAY SECTOR ECONOMICS

Railways form one of the crucial logistics network of any economy for both freight and passenger traffic. With its extensive network it can play an integrating role in the economic development of the country. The Indian Railways contribute about 1% of the country's Gross National Product (GNP). To have an objective assessment of the success of Indian railways it is imperative to understand the economics of the sector in order to clearly assess its revenue generation potential. It is imperative to know the funding pattern for Railways in India before investigating into the sources of revenue and ways of expenditure.

## Railways Funding

The Indian Railways follow the FYPs for planning the strategies to meet the growing demands of the sector. Further, the FYP is implemented and evaluated through annual railway budget to ensure that priorities as laid down in the FYP are achieved within the time frame and within the limits of resource. The provision for funding the railway sector in India is fundamentally through the railway budget. Since 1924-25, railway finances have been separated from the General Revenue. The Indian railways have their own funds in the form of Railway Budget presented to the Parliament annually. However, the overall provision of the funds for the sector is realized under the following heads:

- a. Budgetary support – funds from this source are utilized for the creation of new railway assets
- b. Internal revenue generation – After accounting for the working expenses, the remaining amount from the traffic revenue is appropriated to three different heads, namely – Railway Capital Fund, Depreciation Fund and Development Fund.
- c. Borrowings from the domestic and international markets- The Indian Railway Finance Corporation (IRFC) borrows funds from the capital market for the acquisition of additional rolling stock.
- d. State Governments and Special Purpose Vehicles – In a few cases the State Governments have funded the railway projects jointly with the Central Government. For instance, Tamil Nadu Government is financing the gauge conversion project in the State. Apart from it the Indian Railways procure funds through Special Purpose Vehicles like Rail Vikas Nigam Limited (RVNL), Mumbai Railway Vikas Nigam (MRVN) etc. The initial capital is contributed by the Indian Railways and then they raise funds through private sector, multilateral organizations, financial institutions etc.

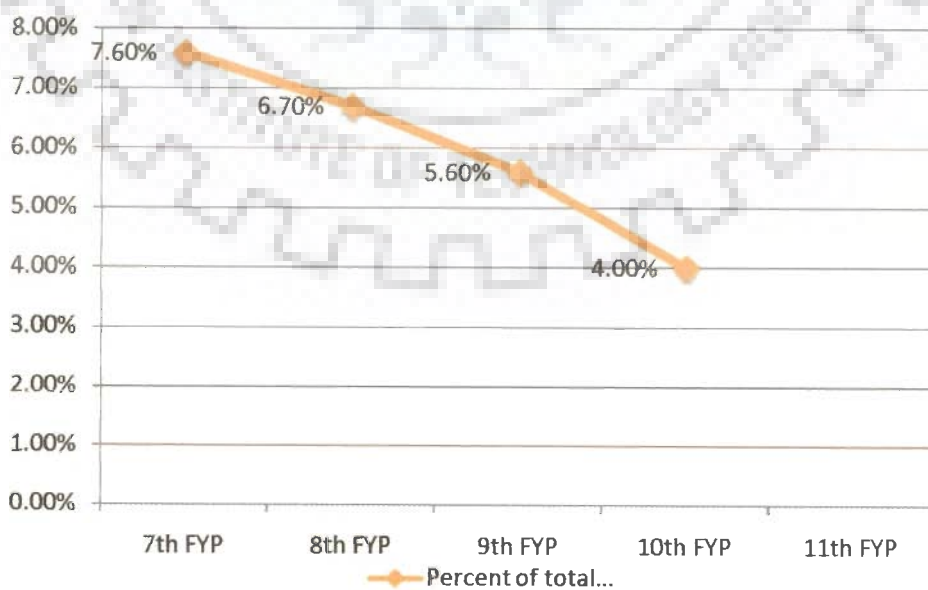
It is pertinent here to review the funding pattern of railways in the last few FYPs to have an overview of the percentage spending of the total Government spending on this sector. The figures provide the details of the total Government outlay for the sector during 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup> FYPs. It is evident from the graph that as a percentage of total Government outlay for the FYPs the share of railways has consistently declined. It fell down from 7.6% in 7<sup>th</sup> FYP to 4% in 10<sup>th</sup> FYP.

The funding descriptions provided earlier are all conventional sources of financing. However, the major source of income for Indian Railways is the freight and passenger revenue. In the following section, the status of the freight and passenger traffic and revenue generated through them is discussed.

### Passenger Traffic

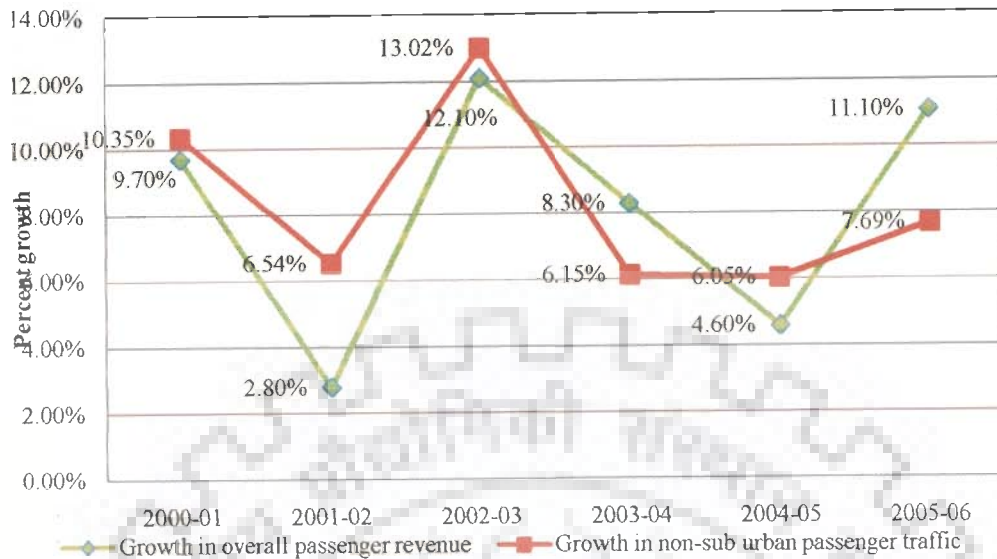
In transportation of passengers railways play a very important role in any economy. In India railways carry about 15% of the total passenger traffic compared to 85% by the road transportation. The Passenger services in India contribute to less than 30% of the railway's revenue. The two major market segmentations for the Indian Railways in the passenger category are the sub-urban and urban passengers. Sub-urban passengers are not profitable as compared to urban passengers. Sub urban passengers constituted 57% of the total railway passenger traffic in 2006-07 but accounted for only 8% of the passenger revenue. The figures provide the details of the growth in passenger traffic and overall revenue generation from the passenger traffic. It is observed that the annual growth rate of the revenue generated from passenger traffic over the period 2000-06 is less than the growth rate in the non-suburban traffic.

**Figure 3.3.3: Outlay for Railways in FYPs as percentage of total Plan Outlay**



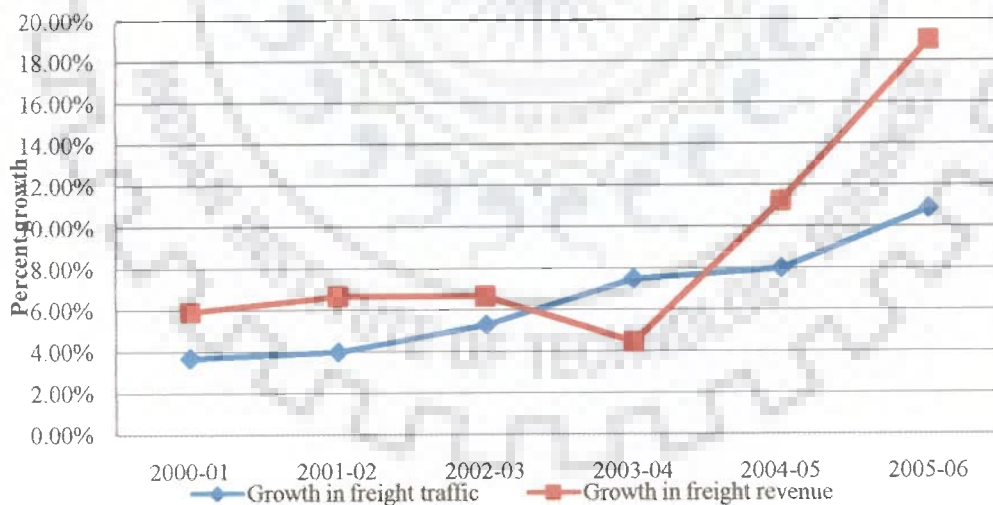
Source: Various FYPs of Govt.

**Figure 3.3.4: Growth of Indian Railway's Passenger Traffic versus Passenger Revenue**



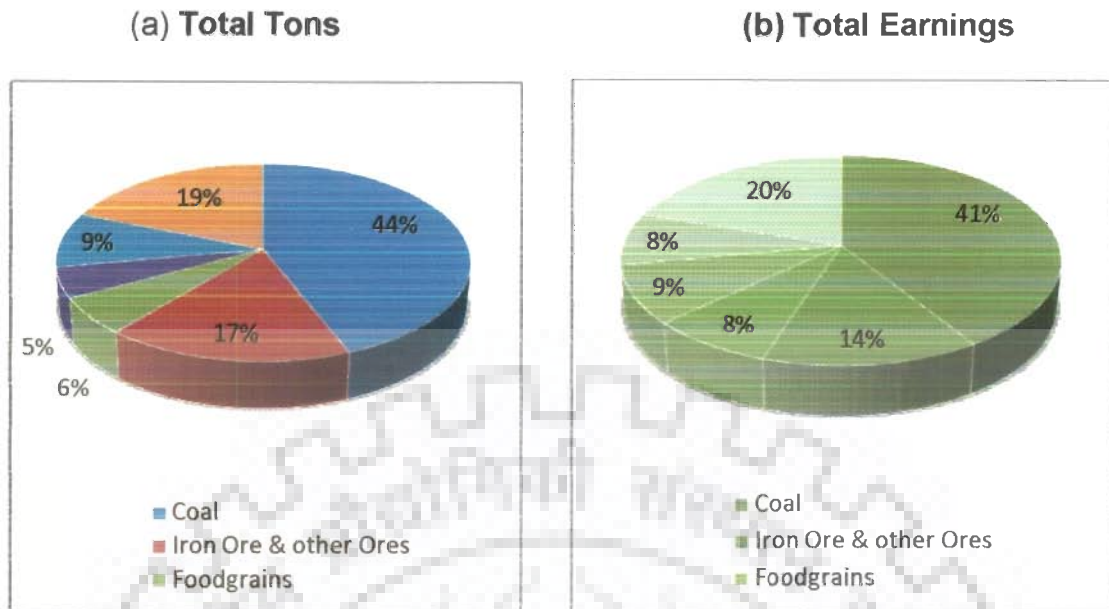
Source: Ministry of Railways, Year Book various years; Economic Survey various years

**Figure 3.3.5: Growth of Indian Railway's Freight Traffic versus Freight Revenue**



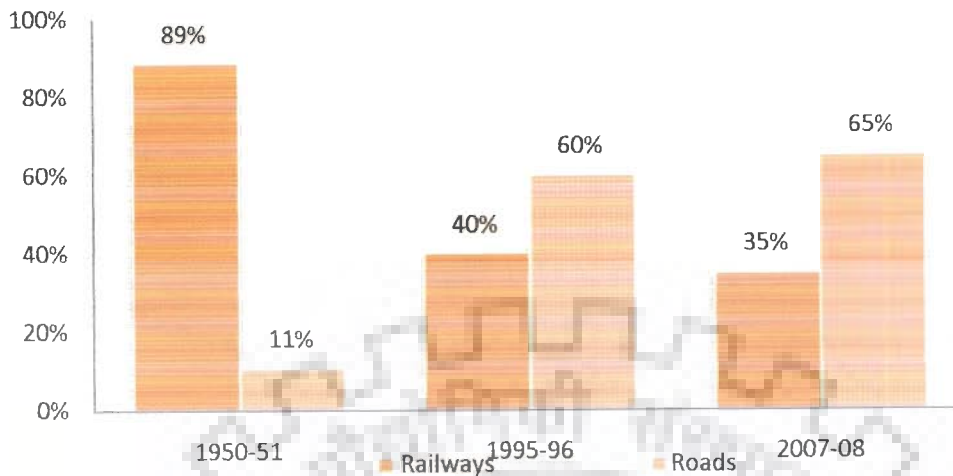
Source: Ministry of Railways, annual reports various years

Here, it will be appropriate to examine the composition of the freight traffic to have an understanding of the commodities traded. The Indian railways carry huge variety of goods, such as mineral ores, fertilizers, petrochemicals, agricultural produce and others. Coal forms the bulk freight for the railways followed by Iron – ore and other ores. Figure 3.3.6 exhibits the details of the goods carried by Railways as freight.

**Figure 3.3.6: Commodity-Wise traffic share in Railways as %age of the total**

Source: Annual Report, 2007-08, MoR; Economic Survey, 2007-08

The railways have performed well in the last few years in terms of revenue generation. According to the Railway Budget 2008-09, the gross traffic revenue for the year 2007-08 was 16% higher than that of the previous year and 2% higher than the budgeted estimate. Freight traffic has increased from 73.2 million tonne in 1950-51 to 794.21 million tonne in 2006-07. However, it has lost considerable amount of its freight market share to road sector (figure 3.3.7). It is evident from the graph that in the early fifties the share of freight traffic in the Railways was around 89% but later it was reduced to as low as 35%. The share of the freight traffic in the road sector increased from 11% to 65% during the same period, which is a very sharp decline for the railways and a very steep rise for the road sector. The share of road transport in India's GDP is 4.6%, while that of railways is 1%. The supply-side constraint is one major reason for this comparative low performance of railways vis-à-vis road sector. The issues of insufficient wagons availability and lack of considerable number of freight trains are the causes of concern for the railway sector in India<sup>4</sup>. However, to combat this, the Railway Ministry has plans to develop dedicated freight corridors connecting major commercial hubs in the country, for instance freight corridor connecting New Delhi and Mumbai and Kolkata. The Ministry of Railways has also taken initiatives to develop port-connectivity projects by establishing Special Purpose Vehicles (SPVs). Also, the Ministry of Railways started the "Own your Wagon" scheme in the 8<sup>th</sup> FYP, launched in 1994-95 but has not received much response.

**Figure 3.3.7: Share of freight Traffic - Railways versus Roads**

Source: India Infrastructure Report.

The other significant step taken by the Ministry of Railways is its initiative towards involving the private sector participation in the railways. In the following section, we discuss private-sector participation in the railways.

### 3.3.3 PRIVATIZATION IN RAILWAYS

In India private sector participation in the railways was not allowed till the last decade. However, it was in the 8<sup>th</sup> FYP that the Government introduced the private sector participation with the initiation of “own Your wagon” scheme. Later on, the Government introduced private sector investment in the allied activities of railways, like station development, equipment and components manufacturing units etc. However, no private investment is still encouraged in passenger rail coaches running and rail-track development. Here, it will be instructive to examine the two most privatized railway industries of the world, namely, US railways and UK railways.

**The US Privatization model of Railways:** In the US, the private companies in the railway sector operate both tracks and the trains that run over them. A particular location may be served by one or many railroads, and it is common for a pair of major cities to have two or sometimes three “parallel” railroads operating between them, competing for customers. In such a kind of system, the type of customers whether passengers or enterprises wishing to ship their goods or commodities have the freedom to choose their service – provider [111]. At



particular locations, individual railroads may together form a “switching area”, where each railroad may run its train on each other railroad’s track (the switching area track may be jointly owned by the local Government or by the railroads that use it). These kinds of arrangements are based upon the mutual agreement between the two rail-road companies and “Compulsory” trackage rights, that is, access mandated by a government regulatory agency, are not common [74].

**The UK Railway System:** In the UK the model of privatization is different from that in US; it operates on a system which can be defined as “*many trains, one track*” model which can be interpreted as partial vertical separation. In this kind of system the ownership and control of the track is separated from the operation of the trains into two completely independent enterprises. The purpose of this system is to encourage competition among the train operators to enter the rail market. There exists only one Track Company, namely, Rail track which provides access to both freight and passenger trains at a regulated tariff level.

In the case of India, as discussed earlier, the Government relies fundamentally on one single entity that owns, operates and maintains both the rail tracks and rails with the assistance from its subsidiaries. This is a highly vertically integrated system. However, in recent years the Government has realized its incapability of funding and building the state of art facilities for the railway infrastructure. Also, there has been a growing challenge from the road sector which has been able to capture an appreciable market share of the freight traffic. Further, to aggravate the situation the railway is also facing challenge from the economy class airways in the upper stream of the passenger traffic. In the light of these developments and growing passenger and freight traffic the Government has initiated private sector participation in the railways. To encourage private participation in the sector, the Ministry of Railways has recently formed a PPP cell at the Board level to guide in the initiatives of the Indian Railways on PPP. However, there is no exhaustive policy document on Public Private Partnership in the Railways which may act as a guiding document to effectively implement the PPP process.

However, Government has no intentions at present to encourage private participation in the core activities of the railways. The Eleventh FYP also laid emphasis on PPP as a source to reduce the burden on the Government budget.

In recent years Government also allowed FDI in the railways sector, FDI up to 100 per cent is permitted under the automatic route in railway infrastructure as long as train operations are not involved.

### 3.3.4 CONCLUSION

The Eleventh FYP has set ambitious targets for Indian Railways expansion in terms of new asset creation and also in terms of increased freight and passenger traffic growth. It was envisaged that freight transportation would increase from 481 billion Net-Tonne Kilometer (NTKM) in 2006-07 to 702 billion NTKM in the terminal year 2011-12, and that passenger transportation volume would increase from 695 billion PKM in 2006-07 to 924 billion PKM in 2011-12. To achieve these targets, on an average an annual growth rate of 9.2% is required in freight traffic and 6.6% in passenger traffic growth. However, according to the latest figures on the increase in the freight traffic in the first two years of the eleventh FYP, the average growth rate of the freight traffic is around 5.9% and that in the passenger traffic is around 6.0%.

The biggest challenge that lies ahead for the Indian Railways is to absorb the ever-increasing traffic on the existing network and add the needed capacity. It is well recognized that the railways are an economically and environmentally less cost-intensive mode of transportation, and so, the Government needs to strategically develop this sector to effectively transfer passengers and goods<sup>5</sup>. The performance of the Indian Railways in terms of revenue generation has increased dramatically from 2005-06 to 2007-08, and its cash surplus before dividend rose from Rs. 90 billion to Rs. 250 billion in this period [96]. But despite this improvement, the investment requirement of the sector is enormous, and to meet the investment required, apart from the plan outlay, the Ministry of Railways has planned to raise Rs.1000 billion during 11<sup>th</sup> FYP from the private sector participation.

#### Endnotes:

<sup>1</sup> The choice of UK and US in this section of the research study, which is a deviation from the rest of the study, is mainly with the intention to compare with the railways that are somewhat comparable in size, technology and geographical cover.

<sup>2</sup> In route electrification developed countries have more than 50% of their route length electrified. The two extreme cases are US and Switzerland. In US railway electrification is zero as all the railway traffic moves on diesel locomotives and in Switzerland there is 100% electrification of railways [2]

<sup>3</sup> Based on the Ackworth Committee Report of 1924 the finances of Indian Railways were separated from the general national exchequer and it gets its annual requirement for funds through a separate budget voted and presented to the Indian Parliament.

<sup>4</sup> A few of the studies [2] also propagate that one important reason for preference towards road sector for freight transportation is the over-priced freight transportation in the railways. According to experts this is done to subsidize passenger travelers.

<sup>5</sup> The global transportation market has already seen a remarkable shift towards the railways. During 2000-2005 the global railway freight traffic witnessed a growth of 25% and rail passenger traffic a growth of 19% [150].



## **SECTION D: FDI IN INFRASTRUCTURE DEVELOPMENT IN INDIA**

In the following section FDI inflows into the Indian road sector is examined in the light of overall private participation in the country and across other developing nations.

### **3.4.1 FDI IN INDIAN ROAD SECTOR-AN ANALYSIS**

FDI in Indian road sector is a recent phenomenon<sup>1</sup>. However, NHDP has experienced a good number of projects being commissioned through private sector participation since its inception in the year 2000. The Eleventh FYP for India indicates that almost 34% of the total funding requirement for the road sector has to be realized through private sector participation and that a major share of it, around \$ 9 to 10 billion, has to be in the form of FDI. It will be inclusive here to study the existing pattern of FDI inflow into the sector. According to the estimates, currently around 8% of the total funding is realized from foreign funds, and the GOI expects to raise this to about 15% in the rest of 11<sup>th</sup> FYP<sup>2</sup>.

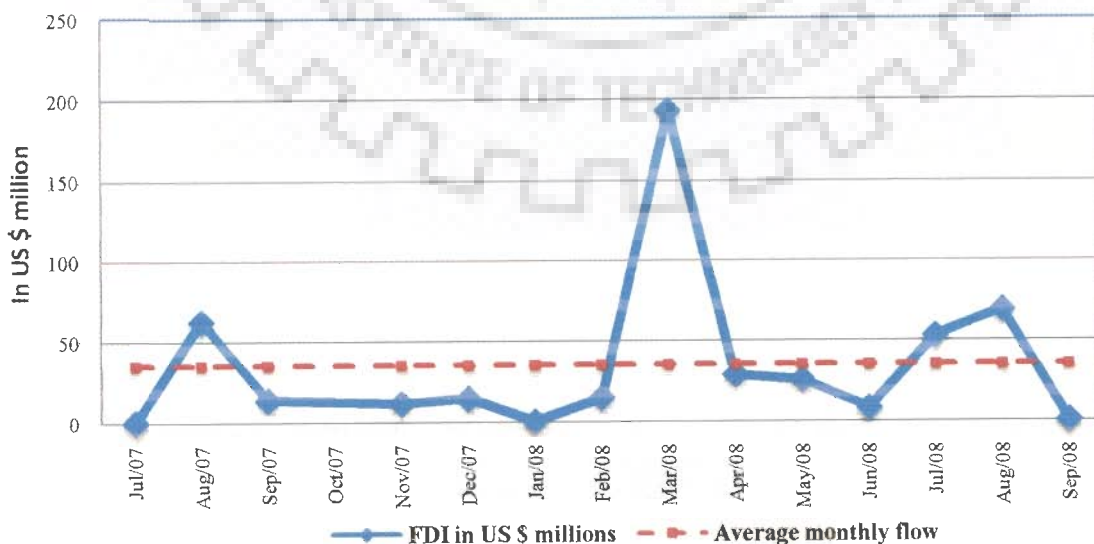
The FDI data as available is from July 2007, due to absence FDI in earlier years, as such number of yearly observations were a few. A monthly trend analysis was carried to understand the intensity of inflow, the detailed country wise and region wise inflow is provide as Annexure. The graph depicts that the average monthly flow of FDI to the sector is around US \$ 35.7 million (Figure 3.4.1). On comparing this with the Governments estimate for leveraging US \$ 10 billion in the next five years around US \$167 million average monthly FDI inflow has to be realized in the sector.

A detailed analysis was also done to find out the direction of flow of FDI both in terms of country of origin (Table 3.4.1) and region of destination (Table 3.4.2). The graphical data discloses one very interesting fact that an appreciable amount of FDI in this sector has been realized in the month of March 2008, which originated from Mauritius and was invested in the Mumbai region. A further qualitative analysis revealed that major FDI inflow into this sector has originated from Mauritius which is around 60% of the total. This is followed by Cyprus and Germany at the second and the third place respectively (Figure 3.4.2). One reason that can be probably cited for the maximum FDI coming from Mauritius is

the existence of bilateral treaty which exempts companies from certain taxes in the country of investment. The other important revelation was that FDI has been basically routed to the metropolitan region of the country, the only exception being Guwahati. The region procuring major FDI chunk was Mumbai followed by Hyderabad and New Delhi, Mumbai and Hyderabad had a share of 48% and 37% respectively (Figure 3.4.3).

In order to have a broader overview of equity financing to this sector it is imperative to study the private participation pattern in the road sector in India and also globally. This comparison would provide an understanding of India's capability for attracting FDI in an intensely competitive environment. In the last one and half decade, globally this sector has witnessed a lot of private investment (Figure 3.4.4). Private activity in the road sector followed an upward trend in the last few years, especially in the year 2007. In the year 2007, road sector witnessed 59 private investment projects globally and amounted to US \$ 15.3 billion. Mexico, India, China and Indonesia accounted for 83% of the project and 73% of the investments<sup>3</sup>. In the year 2007, India executed 29 road projects valuing US \$ 2.8 billion but a majority of the equity in these projects is from domestic firms. This presents a good case for analysis of conditions which can make India competitive and attractive for leveraging FDI in this sector.

**Figure 3.4.1: Monthly FDI inflow into the Road Sector (2007-2009)**



Source: Author's calculation based on data provided by the DIPP, India

**Table 3.4.1: Details of country of origin of road sector FDI during  
(July 2007-September 2008)**

	Home Country	Amount of FDI in US \$million
1	MAURITIUS	301.62
2	CYPRUS	78.61
3	GERMANY	66.54
4.	HONGKONG	13.79
5.	U.S.A	9.8
6.	U.A.E	9.48
7.	SPAIN	6.05
8.	INDONESIA	4.37
9.	VARIOUS NRIS AND INSTITUTIONAL INVESTORS	3.38
10	OMAN	2.82
11.	U.K	2.13
12.	JAPAN	0.94
13.	FRANCE	0.83
14.	NETHERLANDS	0.53
15.	AUSTRALIA	0.51
16	IRELAND	0.43
17.	SWEDEN	0.27
18.	SWITZERLAND	0.25
19.	LUXEMBOURG	0.18
20.	FINLAND	0.04
21.	BAHAMAS	0.04
22.	BELGIUM	0.01
23.	SOUTH KOREA	0.004
24.	CANADA	0.0007

Source: Author's calculation of disaggregated Data of DIPP, GOI.

Figure 3.4.2: Share of countries in FDI inflow in Indian Road sector

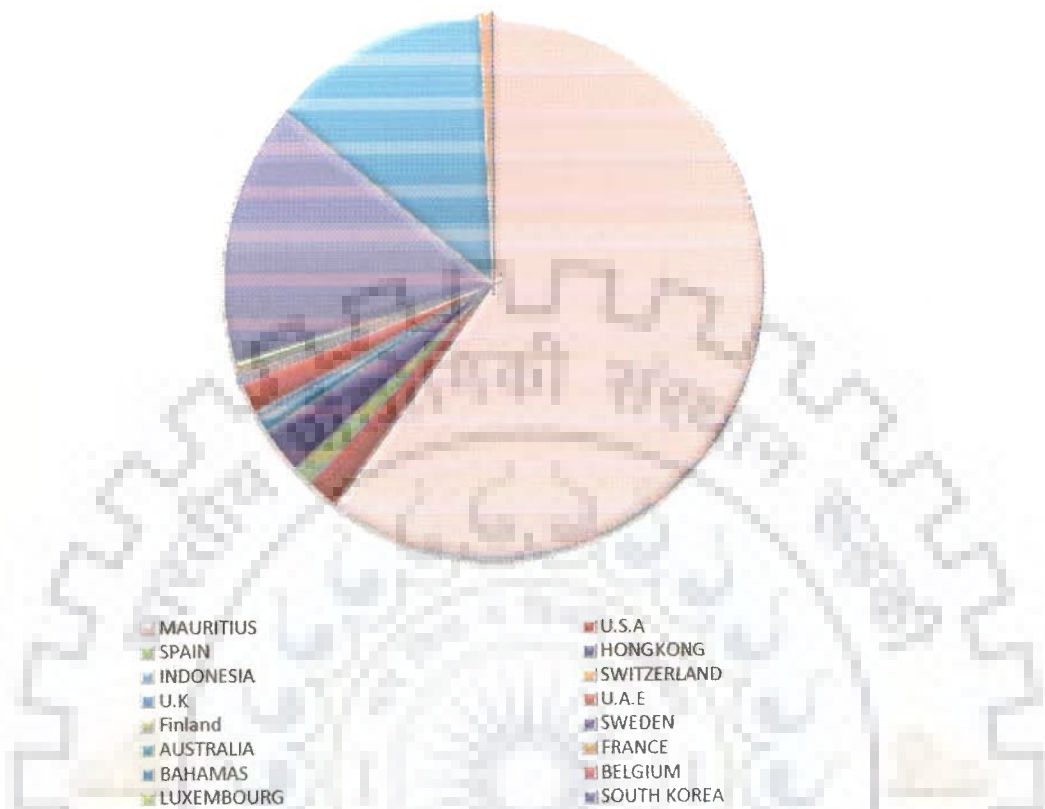
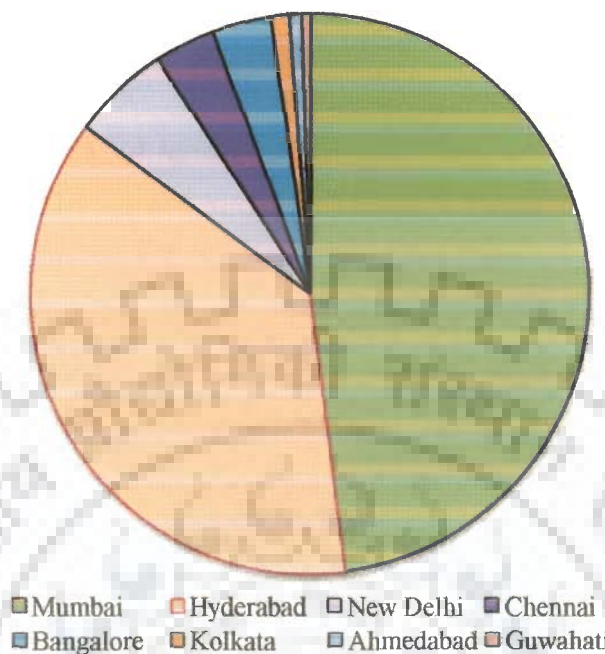


Table 3.4.2: Region of Investment in Road sector during (July 2007-September 2008)

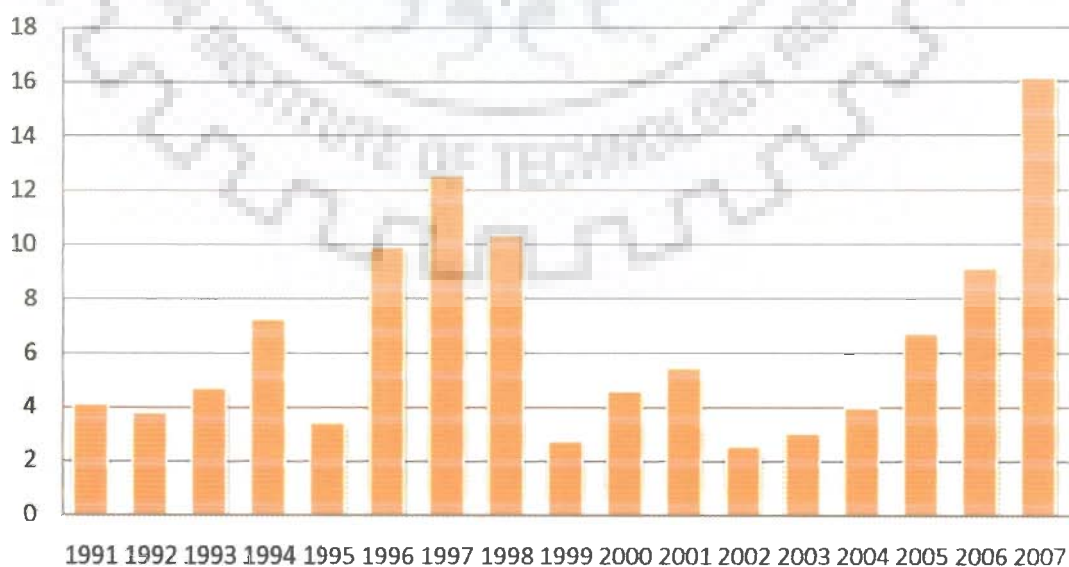
	Region of Investment	Amount of FDI in US \$million
1.	Mumbai	254.62
2.	Hyderabad	197.32
3.	New Delhi	30.16
4.	Chennai	18.57
5.	Bangalore	18.04
6.	Kolkata	5.53
7.	Ahmedabad	3.83
8.	Guwahati	2.73

Figure 3.4.3: Region of FDI inflow share in total



Source: Author's calculation based on data from DIPP, India

Figure 3.4.4: Investment commitments to road projects with private participation in developing countries, 1991–2007 (in US \$ millions)



Source: World Bank and PPIAF, PPI Project Database 2009



### 3.4.2 FDI IN THE POWER SECTOR

In the last decade, India witnessed a major surge in FDI inflows due to the liberal policy environment which played an important role in the economy [128]. Apart from providing the much needed finances, it also brought with it the spillovers in the form of technological advancement, efficient work culture and management. India and China both offer large market for FDI but still China has managed to take away the lion's share of the total inward FDI in the developing economies in recent years. Also FDI, as a percentage of gross domestic fixed assets formation is very low for India as compared to that of Brazil and China. One obvious reason for such remarkable difference happens to be the late acceptance of market liberalization programmes in India as compared to that of China. Another often quoted reason is that the decision making process regarding FDI and its implementation is more centralized in the totalitarian system (China) as compared to that in the democratic system (India), which results in delays in projects' finalization and take off [109]. However, in the last two years India has seen a marked improvement in its perception as being one of the most favoured destinations for FDI inflows for the period 2007-2009 by the international investors' community [151].

In the power sector, FDI is mainly market seeking for investors<sup>4</sup>. Interestingly, in India the sustained growth in GDP and the rising income levels over the last few years have made the country increasingly attractive to the market-seeking FDI. Latin American economies, namely, Chile, Brazil and Argentina, were among the early developing countries that experienced major foreign investment in the electricity sector. However, FDI in the power sector in India has been very thin as compared to the overall FDI inflows, and in comparison to its Asian counter part, China, India has been able to manage only a small share. Tables 3.4.3 and 3.4.4 exhibits the share of FDI inflows in the power facilities over a period of 2001-06 for the two economies.

**Table 3.4.3: FDI in Power Sector in India (in US \$ millions)**

	2001	2002	2003	2004	2005	2006
<b>FDI in Power Sector</b>	113	557	22	46	28	180
<b>Total FDI</b>	3403	3449	4269	5700	6600	16800
<b>Percent of Power Sector</b>	3.3	16.1	0.52	0.81	0.42	1.1

Source: Power, DIPP; Total FDI, UNCTAD- WIR, database 2001-07.

**Table 3.4.4: FDI in Power Sector in China (in US \$ millions)**

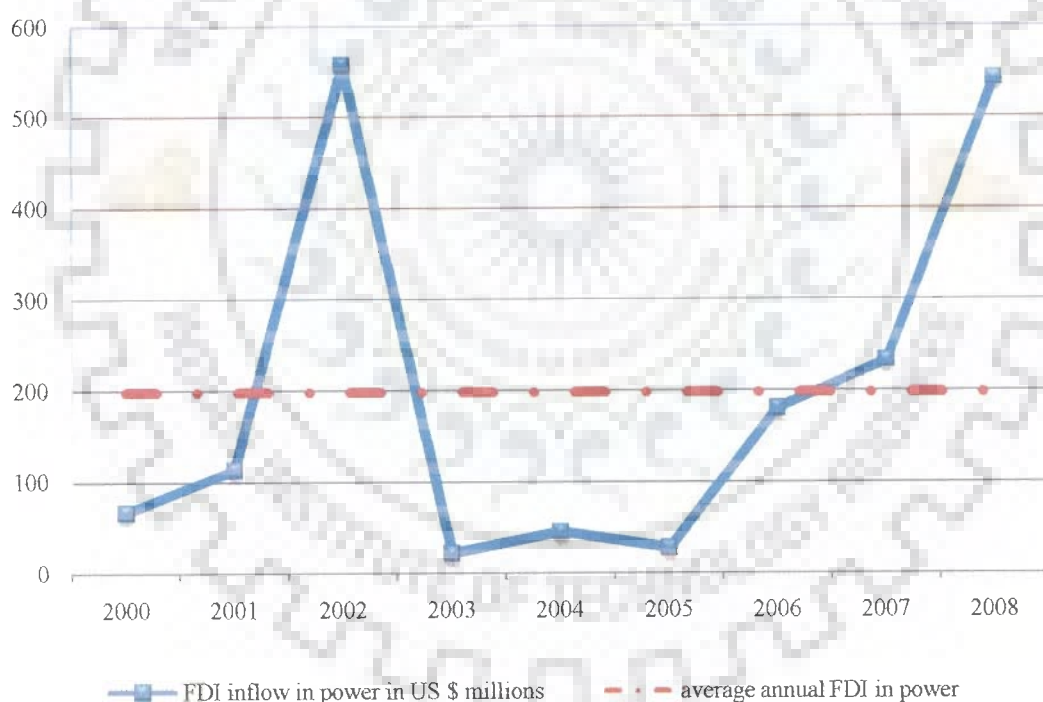
	2001	2002	2003	2004	2005	2006
<b>Flow in Power</b>	213	147	207	396	350	NA
<b>Total FDI</b>	46800	52700	53500	60600	72400	69500
<b>% of Power sector</b>	0.45	0.27	0.38	0.65	0.48	NA

Source: Power, Bureau of Statistics China; Total FDI, UNCTAD-WIR, database 2001-07

Countries across the globe have been competing hard to attract FDI in their electricity sector mainly to fill the gap arising due to lack of enough public funds in the sector, which otherwise is very cost-extensive for the transition and developing economies. The other important intention behind attracting private capital is to have access to advanced technology. Likewise, the Indian Government in recent years has been struggling to restructure the power industry, unbundling the sector separating generation, transmission and distribution to make each of the activities attractive and competitive for private equity participation. The main intention of the Government behind leveraging private funds, whether domestic or foreign, in this sector is to achieve financial solvency so as to be able to meet the goal of “**electricity for all by 2012**”. In the last couple of years private participation improved in certain segments of the power sector- generation, merchant plants,

renewable energy, hydro-energy, distribution and also some participations was also witnessed in the transmission. However, still looking at the other world economies the private participation in this sector is very low and FDI is almost negligible. During the period 2000 - 2008 India could fetch on an average only US \$ 198 million in its electricity sector which is just 3.2% of the annual investment requirement of the electricity sector during 10<sup>th</sup> FYP and 1.4% of the annual investment needs of the 11<sup>th</sup> FYP<sup>5</sup>. According to the industry experts and analysts, the volume of FDI in India's power sector will fall short of the Government's target even in the near future. Academicians and researchers identify several factors for this undesired phenomenon.

**Figure 3.4.5: FDI inflow in the Indian Power Sector during 2000-2008**



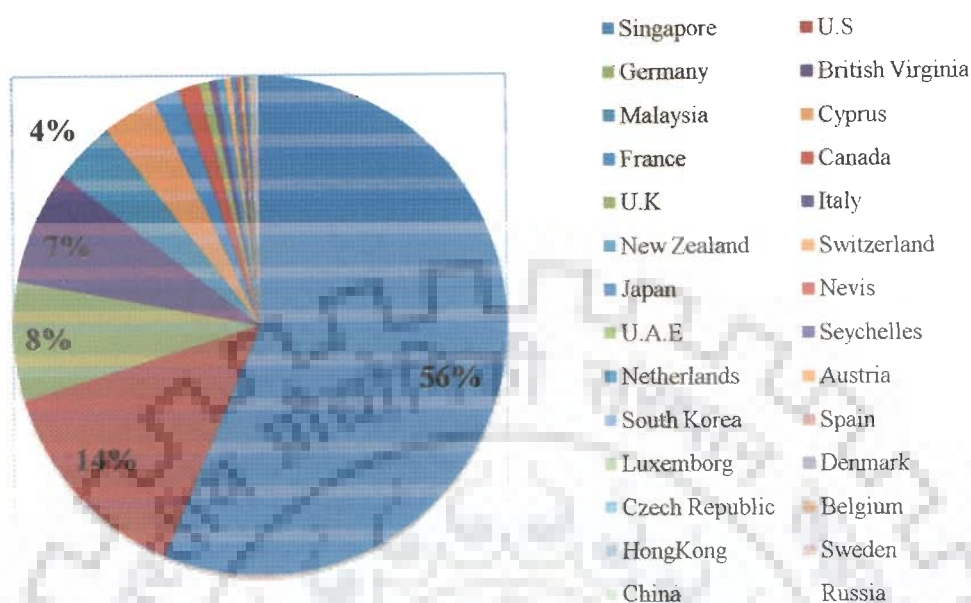
Source: Calculation based upon the data provided by the DIPP, Ministry of Commerce, India

**Table 3.4.5: FDI inflow in power sector from country of origin during  
(April 2000 - September 2008)**

S.no	Country of origin	Amount of FDI in US \$ millions
1.	Singapore	269.65
2.	U.S	65.92
3.	Germany	37.1
4.	British Virginia	35.61
5.	Malaysia	19.2802
6.	Cyprus	17.35
7.	France	8.2802
8.	Canada	6.476
9.	U.K	3.172
10.	Italy	2.544
11.	New Zealand	2.37
12.	Switzerland	1.982
13.	Japan	1.71
14.	Nevis	1.15
15.	U.A.E	1.05
16.	Seychelles	1.02
17.	Netherlands	0.7702
18.	Austria	0.7047
19.	South Korea	0.62
20.	Spain	0.49
21.	Luxemborg	0.34
22.	Denmark	0.20
23.	Czech Republic	0.132
24.	Belgium	0.12
25.	HongKong	0.09
26.	Sweden	0.04
27.	China	0.02
28.	Russia	0.01

Source: Calculation based upon the data provided by the DIPP, Ministry of Commerce, India

**Figure 3.4.6: FDI inflow in Indian Power sector from country of origin as percentage of total**



Source: Calculations based upon the data provided by the DIPP, Ministry of Commerce, India

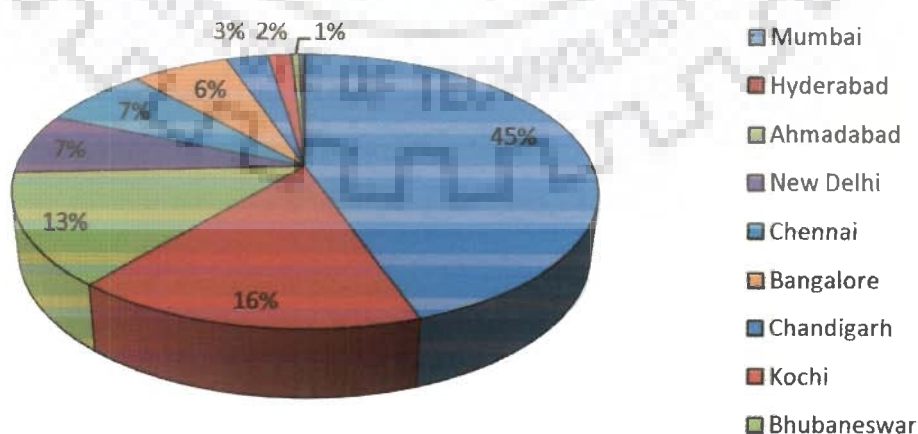
**Table 3.4.6: FDI inflow in Power Sector: Region of investment during April 2000 - September 2008 (Actual flows)**

S.no	Region of Investment	Amount of FDI in US \$
1.	Mumbai	720.60
2.	Hyderabad	264.44
3.	Ahmadabad	212.10
4.	New Delhi	114.701
5.	Chennai	114.69
6.	Bangalore	103.66
7.	Chandigarh	44.64
8.	Kochi	25.16
9.	Bhubaneswar	7.99
10.	Kolkatta	4.55
11.	Bhopal	1.79
12.	Panaji	0.232

Source: Calculations based upon the data provided by the DIPP, Ministry of Commerce, India

It will be appropriate here to review the pattern of FDI inflow into the country in the power sector. Annexure provides the details of FDI inflow into the Indian Power sector during 2000-2008.<sup>6</sup> The analysis reveals that the average annual flow to the power sector is around US \$ 198 million (Figure 3.4.5). Table 3.4.5 and Figure 3.4.6 provide the details of the country of origin of FDI in terms of amount of flow and percentage share of the total. The figures reveal that the major FDI in this sector has been made by Singapore firms in three main regions of the country namely- Hyderabad, Mumbai and New Delhi. This represents 50% of the overall FDI in the sector. Surprisingly these are Institutional investors indulging in equity participation in the domestic power companies. The analysis further points the heavy regional imbalance in the MNCs preferences for the region of investment, Mumbai based power firms take the lion's share of investment (Table 3.4.6) Mumbai takes the leads with 45% of the investment followed by Hyderabad and Ahmadabad with 16% and 13% share respectively (Figure 3.4.7). A very interesting trend revealed here is that there is a greater inclination for investment in the peninsular India as against Northern and North-East India. Only two northern cities namely- New Delhi and Chandigarh find mention in the investment data.

**Figure 3.4.7: FDI inflow in Power Sector: Region of investment during April 2000 - September 2008 (Actual flows)**



Source: Calculations based upon the data provided by the DIPP, Ministry of Commerce, India

Over the last one and half decade India is competing with other emerging economies to attract more FDI in its power utilities, with a variety of tax and investment incentives. In recent years the Government of India allowed 100% FDI in the power sector under automatic route (nuclear power being the only exception) and introduced lucrative policy measures to attract major foreign investors into this sector. Also, the recent WIR 2007 and 2008, both rank India as the second most preferred destination for inward FDI by major Transnational Corporations (TNCs), next only to China. However, despite these two most favorable developments, India has failed to attract significant amount of FDI in the important sector like power. FDI in India in power sector is below the potential (Singh, 2007). The analysis of the secondary data reveals that FDI inflows into the Indian power sector as compared to that in China are very lean and also there is also lot of regional imbalance in the flow of FDI. In order to fetch more foreign investment it is important to identify the hindrances which are obstructing the desired level of FDI in the sector. In the next part an effort is made to assess the strengths and weaknesses of the Indian investing environment in comparison to those of a few other economies.

### **3.4.3 FDI ENABLING ENVIRONMENT: A CROSS-COUNTRY ANALYSIS**

This chapter focuses on providing a comparative assessment of the investment environment related to FDI in a few developing economies. As already discussed in the preceding chapters, FDI today has become the most opted funding instrument for financing industrial and service activities, especially in the developing economies. It is also realized that many of the economies are striving hard to leverage this funding type for the purpose of developing infrastructure facilities (WIR, 2008). However, only a few have succeeded in fetching an appreciable amount to infrastructure development, and many are still struggling to raise funds through this equity type. It is important to understand host country's specific investment and business environment and the facilities provided which are effective in attracting huge FDI to these countries especially in the infrastructure sector.

UNCTAD (2001 survey) puts forth an argument that countries which enter the race of FDI attraction are bound to cross three stages in their policy

development or reform process. The first generation of reform is the stage when countries slowly and gradually open their erstwhile closed economies by adopting pro-liberalization policies. The early 1990s liberalization era in India represents this stage. The second generation of reforms refers to the stage when countries initiate promotional activities by establishing exclusive investment promotional agencies to build the brand for the country as the attractive investment destination. In this stage countries initiate a variety of incentives ranging from tax holidays to subsidies to duty exemptions etc. In the third stage of reforms countries focus on attracting particular investor types to develop sectors of strategic importance. During this stage countries concentrate on developing specific regions for specific activities for particular investors. Developed nations are in this stage of FDI lifecycle where they are competing to have the best. India's current stage of reform process may be said to reflect the second generation of investment reforms.

There are certain studies which measure FDI policy framework on two scales – one, quantitative, and the other qualitative. The qualitative approach towards FDI policy eventually aims to attract higher FDI inflow for the economy while the quantitative approach counts the value added to per person by the incoming FDI. The first set of reforms is mainly addressed as “FDI enabling” reforms, while the second set is referred to as “Innovation-enabling” reforms [49]. In the following section we will trace the development of economic policy regarding FDI, in a few developing nation namely- China, Brazil and Mexico along with India. The focus will be on the policies specific to infrastructure development. The choice of these economies is based on following considerations. China is chosen as it has a lot of similarities with India due to almost overlapping economic and development history, and also because they both share the same geopolitical situation for their being big Asian economies. Brazil and Chile are taken as study case because these two are developing economies and have been really successful in attracting a great amount of FDI in their infrastructure sector. It is constructive to trace the policy development in India in the background of developments in these economies which will assist us in evaluating the reform stage in India in the global setting.

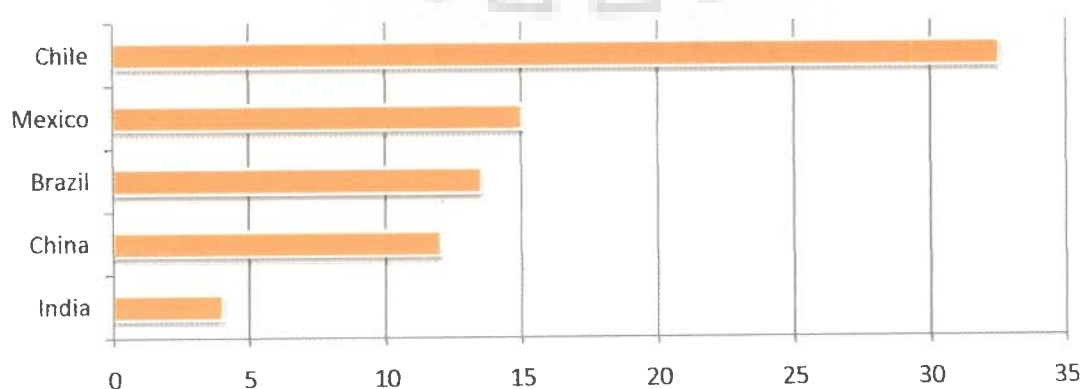
It is interesting here to examine the FDI-related ranking of these countries at the global level before examining the policy environment. The various attributes



for investment rankings discussed here are the ones used by UNCTAD to produce the overall investment ranking of the countries. The first trait investigated is the Transnationalization Index<sup>7</sup> (Figure 3.4.8). It is found that while Chile has the highest level of transnationalization among these nations, India ranks very low in terms of inward FDI contribution. Even the average transnational index for the developing economies is around 23.

Table 3.4.7 provides the details of the number of TNCs operating in these countries. The larger figure is representative of the more conducive and attractive environment for TNCs operation in the countries<sup>8</sup>. The figures for Chinese economy are very astonishing, for the number of foreign affiliates operating in the various sectors of the country is almost 146 times more than that of foreign firms in India. The figures are contrary to the present system of governance in China, where almost all the asset belongs to the Government. However, the reasons for the low figure for Chile could be ascertained due to the saturation of the FDI phenomena in the country<sup>9</sup>. It is instructive here to have an insight into the number of FDI projects in all the three sectors- primary, manufacturing and services of these economies (Figure 3.4.9). The number for China and India on an average has been on the rise as compared to that for other economies under review. This rise is indicative of growing conducive and enabling environment as compared to the situation in earlier years when these economies had more rigid and closed economy. However, the number of foreign affiliates operating in India is very low as compared to that in other nations. This suggests that the country still lacks conducive environment for foreign firm's operation (Table 3.4.8).

**Figure 3.4.8: Transnationality Index- India, China, Mexico, Brazil and Chile**



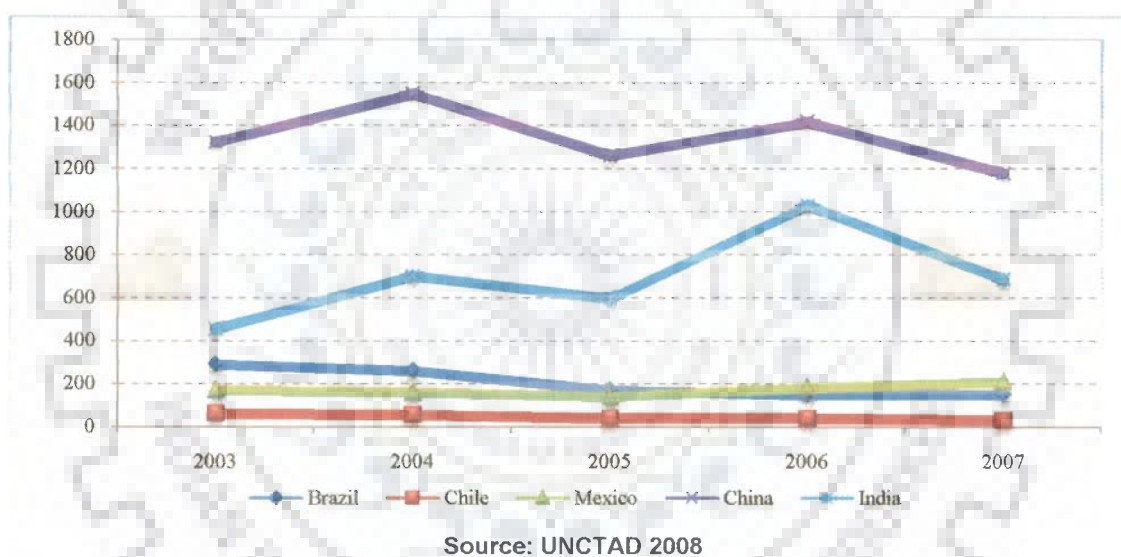
Source: World Investment Report, 2008

**Table 3.4.7: Number of Foreign Affiliates –  
India, China, Brazil, Mexico and Chile**

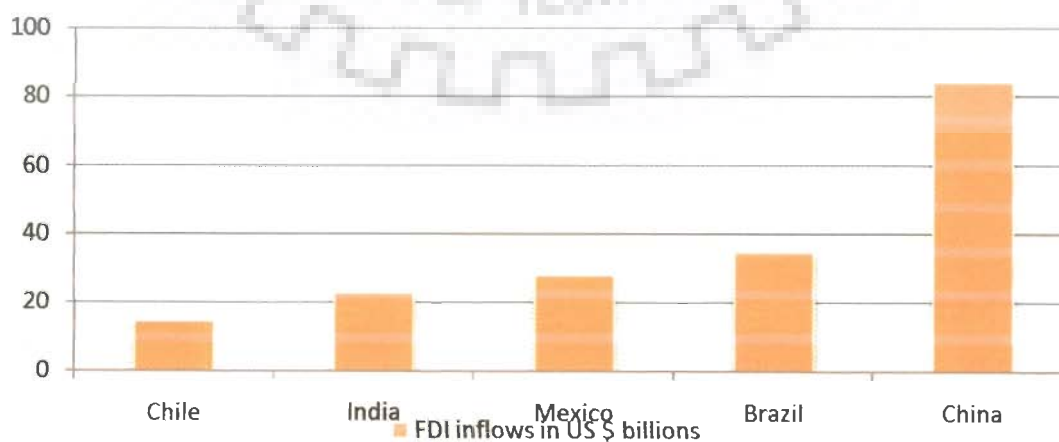
S.No	Host Country	Number of Foreign Affiliates
1.	China	280000
2.	Mexico	25708
3.	Brazil	3712
4.	India	1923
5.	Chile	839

Source: World Investment Report, 2008

**Figure 3.4.9: Number of Greenfield projects-  
Brazil, Chile, Mexico, China and India**



**Figure 3.4.10: FDI inflows in the year 2007-  
India, China, Brazil, Chile and Mexico and India**



Source: UNCTAD 2008

In the case of developing economies all the major reforms related to the liberalization of market and economy have mainly occurred in three major stages – Stage I: slowly and gradually opening the sectors for foreign investment with cap and restrictions on maximum limit to capital investment; Stage II: Enabling the environment providing various incentives in the form of preferential treatment; Stage III: encouraging pro-FDI policies targeting development of specific domestic sectors.

When researchers across the world compare the FDI reforms in countries, it is observed that more or less economies follow the same growth trajectory, the difference being only in the period and duration of reforms. Mostly, the developing economies follow each others' footsteps in framing the policies lucrative enough to attract FDI to overall economy or to a particular sector. The factor which significantly affects the inflow of foreign investment is a set of enabling business environment, which consists of variety of variables as highlighted by the literature discussed in Chapter 2. The ultimate aim of all the investors is to earn maximum profit on the capital invested.

Realizing this, it is arguable that it is not worthwhile to trace the evolution of FDI policy when the objective is to find the determinants of FDI. The researcher, therefore, has confined herself to the study of factors rather than that of reforms and policy. The factors considered in the study are the one's as examined by the WEF survey while establishing the country's attractiveness for investments in infrastructure for Latin American economies. It is believed that the weightage which these factors achieve under various economies' regime is the result of policy reforms or policy deterioration in this economy. In order to attract more foreign equity into infrastructure the effort of the economies should be to maximize their score on these factors<sup>10</sup>.

## **INVESTMENT ENVIRONMENT**

- 1. Legal framework**
- 2. Macro-economic environment**
- 3. Political risk**
- 4. Institutional environment**
- 5. Market size**

6. Degree of customer orientation
7. Financial markets sophistication
8. Time required to start a business

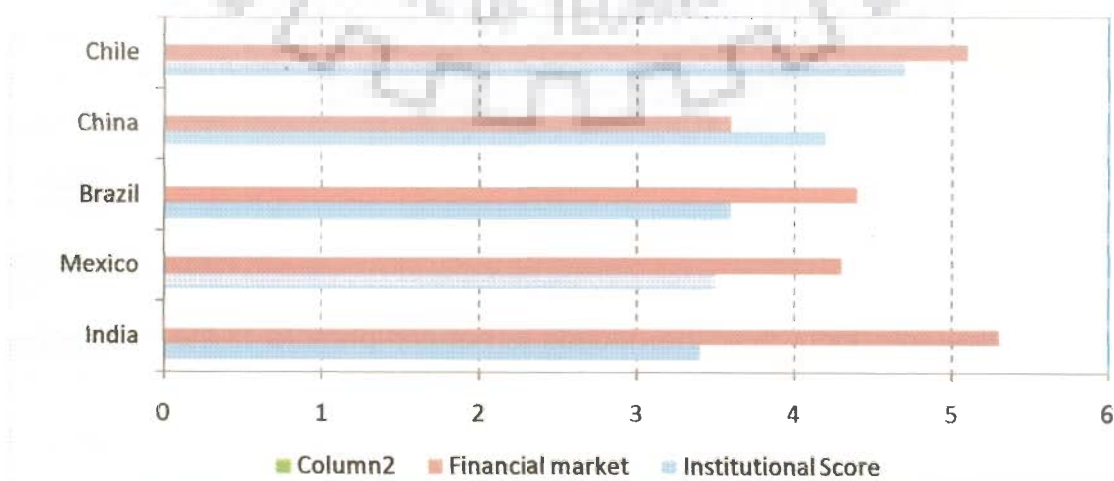
In order to examine the effectiveness of these factors, the researcher studied their value as established by the Global Competitiveness Survey 2008, compared it with the FDI inflows into the infrastructure sector of these economies, and also considered the overall investment ranking of these economies. This review will identify the weak spots of the economies which need to be fixed to improve the investment environment. The researcher's objective of studying these existing secondary data is to examine if the weak spots as highlighted by the GCR and WIR indicators are also the same as indicated by the primary survey results.

**Table 3.4.8: Country rankings for performance in market size, legal and political environment**

S.no	Country	Market size	Legal framework	Political environment	Buyer sophistication
1.	Brazil	10	98	101	56
2	Chile	47	30	26	47
3	Mexico	11	111	94	55
4	India	5	42	55	45
5	China	2	30	46	21

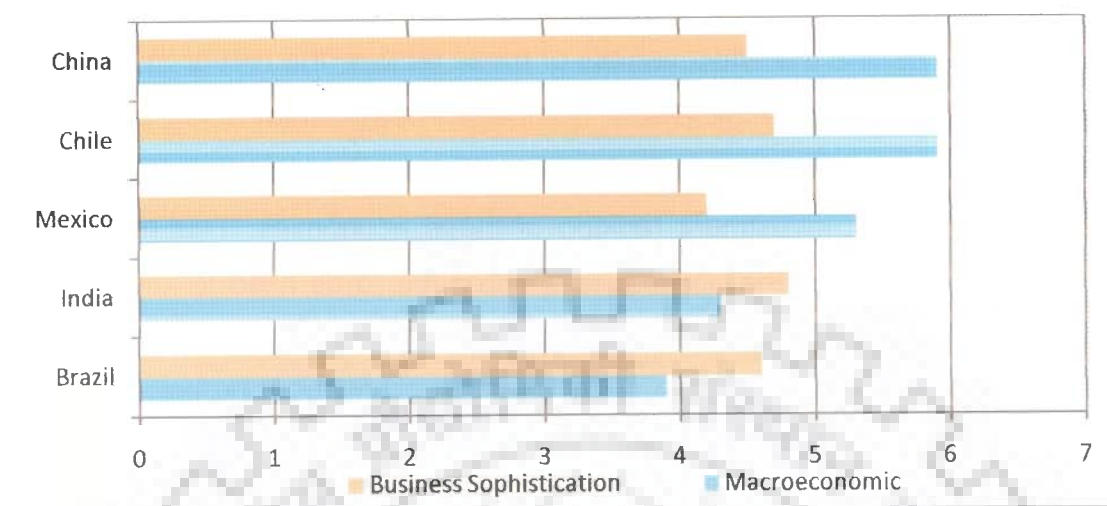
Source: Global Competitiveness Report, 2008)

**Figure 3.4.11: Institutional and Financial Environment**



Source: Global Competitiveness Report, 2008

**Figure 3.4.12: Macroeconomic Environment and level of Business Sophistication**



Source: Global Competitiveness Report, 2008

## CHINA

China has been the largest recipient of FDI amongst all the developing nations of the world since 1993 (Figure 3.4.10). It has also been ranked as the most favored investment destination by the TNCs all over the world, consecutively for the last few years. On analyzing the factors discussed above, it is evident that, among the developing economies<sup>11</sup> discussed in the WIR China scores high. The major strength of China is in its big market size which is the second largest in world. The other strong areas of Chinese economy are its macro-economic stability and its business sophistication, in terms of good supply side chain and high cluster development, which provides competitive environment for industry operation. The major grey areas for the economy are the lack of judicial independence, poor access to finances, and a number of procedures required to start a business (China's rank is 108).

## INDIA

FDI inflow into India over the decade is not comparable to the FDI inflow into China and other peer nations. However, in the last few years India is seemingly becoming the favorite choice of investors, and it has also been able to fetch increased inflows into a few sectors like telecommunications and recently in real estate too. Despite the increased inclination of investors towards Indian

market, India is not able to attract significantly comparable FDI into its economy. The major weak spots for India are inefficient government bureaucracy, lack of infrastructure, procedural requirement for starting a business in India in terms of number of approvals, macro-economic instability in terms of high inflation and high Government debt. The most attractive feature of Indian economy is its big market size which is fifth largest in the world. The other strong focus for the economy is access to financing through local equity participation in which India ranks 8<sup>th</sup> out of 134 economies. However, despite this India's overall ranking in the competitiveness index has fallen. India ranked 42 among 122 economies in the year 2006-07, and this fell to 50 in the year 2008-09 among 134 economies. This conveys a strong apprehension about the increased future flow of FDI into the economy as compared to that into other competing economies.

## **BRAZIL**

Brazil has always been a major contestant for foreign investment inflow among the Latin American economies. The FDI stock in the infrastructure sector for the country has been high as compared to that for India. In Brazil as much as 25.7% of total FDI was in the infrastructure sector<sup>12</sup>. The bright spots for the economy are political stability, big market size, high domestic market competition, high financial market sophistication, and high business sophistication. However, there are some areas which are weak; e.g burden of Government regulations and tax regulations has increased over years which may have probably resulted in decreased FDI inflow.

## **CHILE**

Chile is one of the very first developing economies of the world to have adopted privatization in infrastructure facilities extensively during the late eighties and early nineties. It is also observed that appreciable stock of infrastructure was built, utilizing FDI as a source of financing. The FDI stock that was absorbed by the infrastructure sector was about 24.6% of the overall FDI in the year 2000. The strong features of Chilean economy are political stability, good institutional environment, financial market sophistication, few trade barriers, high transparency

in policy-making environment and high availability of local supply chain. The major areas of concern are restrictive labour laws and inefficient bureaucracy.

### 3.4.4 CONCLUSION

This analysis, based on the data taken from WIR 2008 and Global Competitiveness Report 2008 sheds light on the important factors which play a significant role in attracting investment to any economy. This analysis and the literature review, discussed in Chapter 2, provide the base for selecting variables for primary data survey. This discussion highlights that the extent of TNCs involvement in country is very low as compared to that in the peer nations. However, globally researchers portray India as one of the most favorite destinations of FDI, and still there are lots of policy and environment gaps which need to be fixed in order to be able to attract an appreciable amount of FDI to the infrastructure development.

### ENDNOTES

<sup>1</sup> As per the information retrieved by the researcher from the Department of Industrial Planning and Promotion, GOI, FDI in Indian road sector as a separate record has been maintained since the year 2007 only, and on further investigation the researcher was informed that before this period there was no FDI. International firms which were operating in the sector were operating within EPC framework.

<sup>2</sup> According to the statement made by Mr. Didar Singh, member finance, NHAI in the article titled "Plan to raise \$ 10 billion for road sector through FDI" in the 18th June 2009, issue of The Indian Express.

<sup>3</sup> The data are calculated from World Bank PPI database for various countries. The data as compiled by World Bank include the medium sized and large road sector projects and not small projects due to their non availability because of lack of proper publicity and information. The date was retrieved on 20th August, 2009.

<sup>4</sup> As UNCTAD survey 2008 mentions that investments in infrastructure sector especially by transnational corporations in developing economies are mainly guided by access to huge market and to benefit from the opening of the otherwise closed economies and liberalized investment environment in the infrastructure sector.

<sup>5</sup> According to the DIPP database of the Department of Commerce India, during the period April 2000- September 2008, Indian electricity sector received US \$ 1786.6 million, the researcher found the annual average by taking the average over a 9 year period.

<sup>6</sup> The FDI data as provided by DIPP do also contains the amount invested in the equipment manufacturing industry related to power sector.

<sup>7</sup> Transnationalization index measures the extent to which a country's economy is transnationalized. It is calculated by taking the average of four values- FDI inflows as a percentage of gross fixed capital formation for the past three years 2003-2005; FDI inward stocks as a percentage of GDP in 2005; value added to foreign affiliates as a percentage of GDP in 2005; and employment of foreign affiliates as a percentage of total employment in 2005. It represents both the actual FDI stock as well as the value addition in term of employment created.

<sup>8</sup> While consolidating this data the information available for the countries was for different years. Because of this limitation there is a lack of uniformity in the years of observations; for Brazil, Chile and India it is 2007, for China is 2005 and for Mexico is 2002. Also, the number of firms mentioned represents the foreign affiliates operating in all the sectors of a particular economy.

<sup>9</sup> These are researcher's views in the light of heavy FDI inflows in the country during the late 80s and early 90s due to lack of proper competition for FDI attraction by many other developing economies and Chile becoming the leader in the FDI reform process during that period.

<sup>10</sup> The researcher, based on her review of literature, made few modifications in the factors- institutional factor, market factor, customer orientation as a measure of willingness to pay and time required to start business were added to capture the business environment and matters relating to policy making, corruption etc.

<sup>11</sup> The GCR 08 discusses the investment environment for 134 countries across the world out of which 34 are developing economies and the overall ranking is based on the scoring around twelve pillars. Scoring on these twelve pillars is further based on a number of factors for which individual scoring is done.

<sup>12</sup> Infrastructure sector in WIR, 2008, includes electricity, gas, water, communication, transport and storage.





**CHAPTER 4**

As already discussed in the preceding chapters, a questionnaire was developed to capture the views and perspective of the respondents, in order to find somewhat precise answers to following important questions

- What are the main drivers of the investment to infrastructure sector in the Indian economy?
- What is the perception of the respondents with respect to the existing country level environment of investment in infrastructure sector?
- What are the investors really searching for?

The choice of questions was made with an intention to achieve the main objectives, as described in the problem background, to give the recommendations to Indian Government regarding what factors it should highlight in order to attract more foreign investment into the infrastructure building. Attempt was made to analyze the main issues which were grouped under a few important headings that measure the institutions, policies and factors responsible for either attracting or deterring the private investment in this sector. The choices of the major headings were based on filtering of the determinants, as narrated under the literature study; the major headings are listed below:

- **Macroeconomic and Market Environment** – Under this variable an attempt was made to capture the effect that various macroeconomic and market factors have on the inflow of FDI into the infrastructure projects in India. Earlier studies have highlighted that macro-economic environment of any economy are an eye-opener to the private investors, in particular foreign investors. In this context, the variables considered are those which can assess the economic growth trend and fiscal strength of the Government. The main factors considered are- inflation, exchange rate, GDP, GDP growth rate, public debt, ROI, purchasing power parity etc.
- **Business Environment** – It is observed from the literature review that investors take into consideration the business operating environment which is related to an award of and operation of infrastructure projects in a country. In this concern, the questions under the business variable are framed in such a manner so that it is possible to assess India's business enabling environment for FDI in the infrastructure sector. It aims at examining the quality and

capacity of the Government agencies in interacting with the foreign investors in the case of infrastructure projects.

- **Corruption Environment-** Much of the international debates on the business transparency issues have prominently highlighted that higher levels of corruption in the economies have been one major cause of the lower level of international investor's participation in that economy. The variables grouped under this head aims to assess the extent of corruption prevalent in the Indian working environment and its impact on the investment decisions.
- **Investment Environment** – In the last decade, it is observed that there has been a growing competition among the developing economies to attract the foreign investment by offering a variety of investment incentives. The purpose of this section is to assess the overall effectiveness of the investment environment, as existing in India, in creating an impact on the FDI investment decisions in the infrastructure sector. Various factors as examined are investment promotion institutions, labour policies, taxes, existing infrastructure facilities, incentives etc.
- **Institution and Regulatory Environment-** Several researchers have stressed the importance of law, rules and regulations of the host country in affecting the foreign inflows. The institutional framework a country provides for the operation of private firms – domestic and foreign, plays an important role in shaping the investment decisions of the potential investors. By investigating this variable the quality of the existing institutional, regulatory and legal framework in the Indian infrastructure sector is examined. The main aim is to identify the existing bottlenecks in the system which are discouraging FDI inflows into the sector in the country.
- **Risk-Related Variables** – Infrastructure projects are exposed to a variety of risks owing to their characteristic, particularly, long gestation period and heavy capital cost. Many of the studies reviewed in the literature agree that the type and degree of risk present in any economy greatly affects the destination-choice of an investor. By examining the nature and extent of the major risks associated with the infrastructure projects in India, the attempt is to identify the main deterrents to FDI inflows into the sector.
- **Financial Market Environment** – It is highlighted in the earlier chapters that infrastructure projects are capital extensive and debt forms an appreciable part

of the project cost. In such a scenario, the health of the financial market of the host economy becomes an important indicator of the investor's choice of location. The purpose of studying the financial market environment is to identify that "what is the capacity of the domestic capital market in attracting FDI to the infrastructure sector in India?"

In order to identify the grey areas and highlight the gap between the existing and desired environment, the questionnaire was e-mailed and handed in person to four sets of respondent. As mentioned, the scope of the research work is limited to three main sectors of infrastructure namely – Power, Roads and Railways. Three broad categories of respondent identified are executives and professionals from the firms operating and working in the power, roads and railways sectors. One important consideration here was that due to the shortage of foreign infrastructure operators in India the responses were also collected from the private firms which have received FDI. Apart from this, it was realized that legal consultants, bureaucrats and academicians associated with this sector also hold strong perception about the existing environment in India, so a fourth group was considered which consisted of management and legal consultants, policy advisers/bureaucrats in the various concerned ministries and departments and academicians in reputed Indian and international institutes. In the following part, information generated by the responses of the respondents were compiled and quantified so as to seek a conceptual understanding of the drivers and factors impacting the investor's decisions in the different category of the infrastructure sectors and to capture the policy advocacy of the think-tanks and advisers operating in the infrastructure sector in India.

#### **4.1 Main drivers of investment in the infrastructure sector in India**

In order to understand the perception of the respondents related to the drivers of investment in the infrastructure sector in India, the respondents from four different categories were asked to identify the important factors from amongst the eight factors suggested to them (Part A of the questionnaire). After due compilation of the responses, the relevant information in this regard is presented in Table 4.2. On casual assessment of the table, it is revealed that majority of the

respondents in all categories identified following five as the most preferred reasons for the investment flowing into the infrastructure sectors.

- Existence of big market
- Overall investment climate is investor friendly
- Macro-economic stability is an attractive factor
- Effective institutional framework and
- Favorable business environment

Assessment shown in Table 4.2 is based on the simple numerical summation of the number of respondents answering in favour of a particular driver. From a comparative view of the ranks assigned to each of the variables under different categories it is evident that there exists more or less an agreement among the respondents regarding the rank of the above mentioned drivers. The only exception in this regard is the category of the professionals in the railways sector who view “macro-economic stability” “overall investment climate” and “favorable business environment” in India as the top most factors for attracting investment into the infrastructure sector. These variables, as driver of investment, do not rank first in any of the other categories. It is really strange to see the behavior of the respondents in this category to be very different from the rest of the respondents’ category when their strength is lowest as compared to the number of respondents in other category. One probable reason for this difference may be the background of the respondents, as respondents in this category were mainly executives operating in the Government public sector railway undertakings. This limitation emerged due to the absence of private foreign operators in the railways sector in India and no FDI has directly come into the railways operation, as discussed earlier, whatever FDI is there is one which has come in the railway’s equipment manufacturing companies. A precise account of the five top ranking reasons under each category, for private firms to invest into infrastructure sector in India, is summarily specified as follows:

**Table 4.1 Respondents Category for main drivers of investment in infrastructure sector**

Respondent Category	MAIN DRIVERS OF INVESTMENT IN INFRASTRUCTURE SECTOR				
	I	II	III	IV	V
<b>POWER (19)</b>	Market Factors	Overall Investment Climate Is Investor-Friendly	Macro-Economic Stability	Effective Institutional Framework	Favourable Business Environment
<b>ROADS (29)</b>	-Do-	•-Do- •Macro-Economic Stability	Effective Institutional Framework	Favourable Business Environment	Efficient Risk Coverage
<b>RAILWAYS (08)</b>	<ul style="list-style-type: none"> <li>• Macro-Economic Stability</li> <li>• Overall Investment Climate Is Investor Friendly</li> <li>• Favourable Business Environment</li> </ul>	Market Factors	Effective Institutional Framework		
<b>OTHERS (28)</b>	Market Factors	Macro-Economic Stability	Overall Investment Climate Is Investor Friendly	Effective Institutional Framework	<ul style="list-style-type: none"> <li>• Favourable Business Environment</li> <li>• Financial Institutions Stability</li> </ul>
<b>TOTAL (84)</b>	Market Factors	Macro-Economic Stability	Overall Investment Climate Is Investor Friendly	Effective Institutional Framework	Favourable Business Environment

Note: Figures in parentheses indicate the number of respondents

With the exception of railways sector increasing “*market size and market opportunities*” have been undisputedly voted as the top most reason for investment coming in the various sectors of infrastructure. However, for the second position there is some disagreement between the executives operating in the power sector, they are of view that second important reason for investment flowing in power sector is the existence of favourable investment climate. The difference in the opinion of the power, roads and others category is not very significant as compared to the perspective of the railways professionals (Table 4.2). It is not difficult here to rationalize the variance in the perception pattern of the executives in the power sector. In the last decade, power sector is the only sector to have witnessed number of policy reforms namely –establishment of institutes like CERC, SERCs, Electricity Act 2003, Electricity Act 2005 Electricity

Reforms 2006 etc. All these reforms have resulted in easing the policy and investment environment related to private sector investment in the power sector.

One substantial variation seen is in the preference of the executives working in the road sector. This category of respondents has expressed their agreement for the existence of efficient risk-coverage mechanism in India as an important indicator of increasing investment flowing into the road sector in the country. This can be supported well with the argument that GOI has initiated the procurement of the road concessionaire through standard bid process. There is a standard contract document called Model Concession Agreement (MCA) which clearly delineates the roles and responsibilities of all the major actors in the project and defines the risk allocation methodology as well as lays down exit rules. Few of the respondents highlighted the factors which were missed in the questionnaire these are:

- High rate of returns in India is one lucrative factor for attracting investment.
- India being a fast growing and developing economy offers great market opportunities.
- Ongoing reforms in the power sector such as open access, power exchanges etc.

However, while framing the questions these narrow and detailed reasons were already assumed to be covered under broad category for instance "India is a fast growing and developing economy" evidently is a sub head of Market variable in the part B of the questionnaire (Questionnaire is appended at the back).

**Table 4.2 Major Reasons for the Company to invest in the Infrastructure Sector (India)**

DRIVERS	NO. OF RESPONDENTS HOLDING DIFFERENT VIEWS REGARDING THE SIGNIFICANCE OF DRIVERS				
	Total	Power	Roads	Railways	Others
	Base				
	84	19	29	08	28
1. Market Factors	<u>72</u> (86%)	<u>17</u> (89% D)	<u>27</u> (93% D)	4 (50%)	<u>24</u> (86% D)
2. Macro-economic stability	49 (58%)	10 (53%)	18 (62%)	<u>5</u> (63%)	16 (57%)
3. Favourable Business environment	19 (23%)	3 (16%)	7 (24%)	<u>5</u> (63% BE)	4 (14%)
4. Corruption free environment	1 (1%)	-	-	-	1 (4%)
5. Overall investment climate investor friendly	47 (56%)	13 (68%)	18 (62%)	<u>5</u> (63%)	11 (39%)
6. Effective institutional framework	27 (32%)	7 (37%)	10 (34%)	1 (13%)	9 (32%)
7. Efficient risk-coverage mechanism	6 (7%)	1 (5%)	4 (14%)	-	1 (4%)
8. Financial institutions stability	8 (10%)	1 (5%)	2 (7%)	1 (13%)	4 (14%)
9. Others	4 (5%)	1 (5%)	1 (3%)	1 (13%)	1 (4%)
No Answer	3 (4%)	-	-	-	3 (11%)
<b>Sigma</b>	<b>236</b> (281%)	<b>53</b> (279%)	<b>87</b> (300%)	<b>22</b> (275%)	<b>74</b> (264%)

**Note:** Columns tested at (5% risk level)- B/C/D/E; As most of the respondents have identified more than one factor as important so the total number increases the base value. Figures in parentheses refers to percentages (of the corresponding category total figures)



## 4.2 MARKET AND MACRO-ECONOMIC VARIABLES IMPACTING THE FDI INFLOWS

The perception of respondents was collected on five point Likert scale (variation from “strongly agree” to “strongly disagree”; 5 = strongly agree, 4 = Agree, 3= Neutral, 2 = Disagree and 1 = strongly disagree). The respondents were asked to rate the level at which they agree or disagree with the variables. All of the respondents answered to all the ten variables in the group except in six instances where there was no answer. The information generated by their responses to various aspects of the market and macro-economic variables is presented in the Table 4.3. An attempt is also made to identify the percentage of response received to top 2 Boxes in likert scale in case of all the ten variables. The intention behind this is to identify the share of the respondents who are in agreement to the variables stated in the questionnaire.

A casual look at the values of mean attained by various variables under this group clearly suggest that variable MME7 has been undisputedly ranked at top by all the categories of respondents. The mean value achieved by this variable is between 4.5 and 4.7 for all the categories except for railways where it is 4.1. The trend conveys that consistent growth rate of any nation is an important determinant of FDI to the infrastructure sector in the country. On further interpretation of the results it was found that there is unanimity of views among all the categories regarding the variable MME6 which ranks second in the choice of the respondents. This highlights that GDP which is used in past studies as proxy to market size is an important determinant of FDI in infrastructure sector in India. A detailed look at the quantitative analysis further disclose that five most accepted variable by all the categories of respondents as indicated in figure 4.1 and figure 4.2 are MME7, MME6, MME8, MME1 and MME4, except in case of railways where variable MME5 figures instead of MME8. The mean for all these variables is more than or equal to 4, except for MME5 (3.3).

**Table 4.3: MME-Market and Macro-economic variable impacting the FDI inflows**

Variable	Description	Sectors	Top 2 Box	Bottom 2 Box	Mean	Standard deviation
MME1	The <b>macroeconomic stability</b> of any country bears a positive relationship with the amount of FDI in the infrastructure sector in that country.	Power	18	01 (5%)	4.6	0.8
		Roads	26	Nil	4.4	0.7
		Railways	06	Nil	4.0	0.8
		Others	25	01 (4%)	4.5	0.8
		Total	75	02 (2%)	4.4	0.7
MME2	The high variability (fluctuations) in <b>inflation</b> , as prevalent in India has a negative effect on FDI in the infrastructure sector (as it distorts the informational content of relative prices and indicates about macroeconomic instability).	Power	08	05 (26%)	3.3	1.1
		Roads	13	08 (28%)	3.3	1.1
		Railways	05	01 (13%)	3.8	1.0
		Others	11	05 (18%)	3.3	0.9
		Total	37	19 (23%)	3.3	1.0
MME3	Heavy <b>Government debt</b> as seen in the case of India acts as a deterrent in attracting FDI to the infrastructure sector	Power	03	10 (53%)	2.5	1.1
		Roads	04	13 (45%)	2.6	0.9
		Railways	02	04 (50%)	2.8	1.3
		Others	09	10 (36%)	3.0	1.2
		Total	18	37 (44%)	2.7	1.1
MME4	<b>High variability rate</b> in the value of <b>host country's currency</b> discourages FDI in the infrastructure projects, due to foreign exchange risk.	Power	14	03 (16%)	4.1	1.1
		Roads	19	02 (7%)	3.8	0.9
		Railways	05	01 (13%)	4	1.2
		Others	19	02 (7%)	4	1.1
		Total	57	08 (10%)	4	1
MME5	This is true in case of India too	Power	13	02 (11%)	3.9 C	1.0
		Roads	09	06 (21%)	3.2	1.0
		Railways	05	01 (13%)	3.9	1.1
		Others	07	09 (32%)	2.9	1.1
		Total	34	18 (21%)	3.3	1.1

Table 4.3 (Contd.):

MME6	Market size (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India.	Power	18	Nil	4.7	0.6
		Roads	27	02 (7%)	4.6	0.9
		Railways	06	02 (25%BE)	4.0	1.6
		Others	25	Nil	4.7	0.6
		Total	76	04 (5%)	4.6	0.9
MME7	The consistency in the growth rate (measured by the GDP growth rate) is an important indicator of the future market growth and hence a precursor to higher levels of FDI in a country like India.	Power	19	Nil	<u>4.9</u>	0.3
		Roads	29	Nil	<u>4.7</u>	0.5
		Railways	06	02 (25%BC E)	<u>4.1</u>	1.6
		Others	26	Nil	<u>4.7</u>	0.6
		Total	80	02 (2%)	<u>4.7</u>	0.7
MME8	Return On Investment (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector.	Power	17	01 (5%)	4.4	1.0
		Roads	28	01 (3%)	4.6D	0.7
		Railways	05	01 (13%)	3.9	1.1
		Others	27	Nil	4.6D	0.6
		Total	77	03 (4%)	4.5	0.8
MME9	Very low per capita GDP in India will have a deterrent effect in attracting FDI in infrastructure sector	Power	08	06 (32%)	3.1	1.0
		Roads	08	09 (31%)	2.9	1.0
		Railways	03	03 (38%)	2.9	1.5
		Others	16	06 (21%)	3.5C	1.0
		Total	35	24 (29%)	3.2	1.1
MME10	Purchasing Power Parity may play a crucial role in attracting FDI in country like India, if highlighted in the right perspective by the Government	Power	08	04 (21%)	3.3	0.9
		Roads	07	06 (21%)	3.0	0.8
		Railways	03	02 (25%)	3.1	1.3
		Others	13	06 (21%)	3.4	1.1
		Total	31	18 (21%)	3.2	1.0
MME	All the 10 variables together		520		3.8	1.2

The ranks are based on the mean achieved by the variables under different category of responses. It was also observed that the overall mean score for these 10 variables under the group MME is 3.8 (4 indicates Agree and 3 indicates Neutral). Also, mean score of 5 variables was found more than the overall mean score. Also top to box approach applied to the data indicate that out of expected 840 base responses 520 responses were in agreement with the statements of the survey parameters drawn from the various research studies as indicated in the literature review. This was further strengthened by the fact that mean score of only one parameter (MME3 mean score = 2.7) was < 3 (Neutral).

**Fig 4.1: Pictorial view of the variables highly favoured by the total respondents**

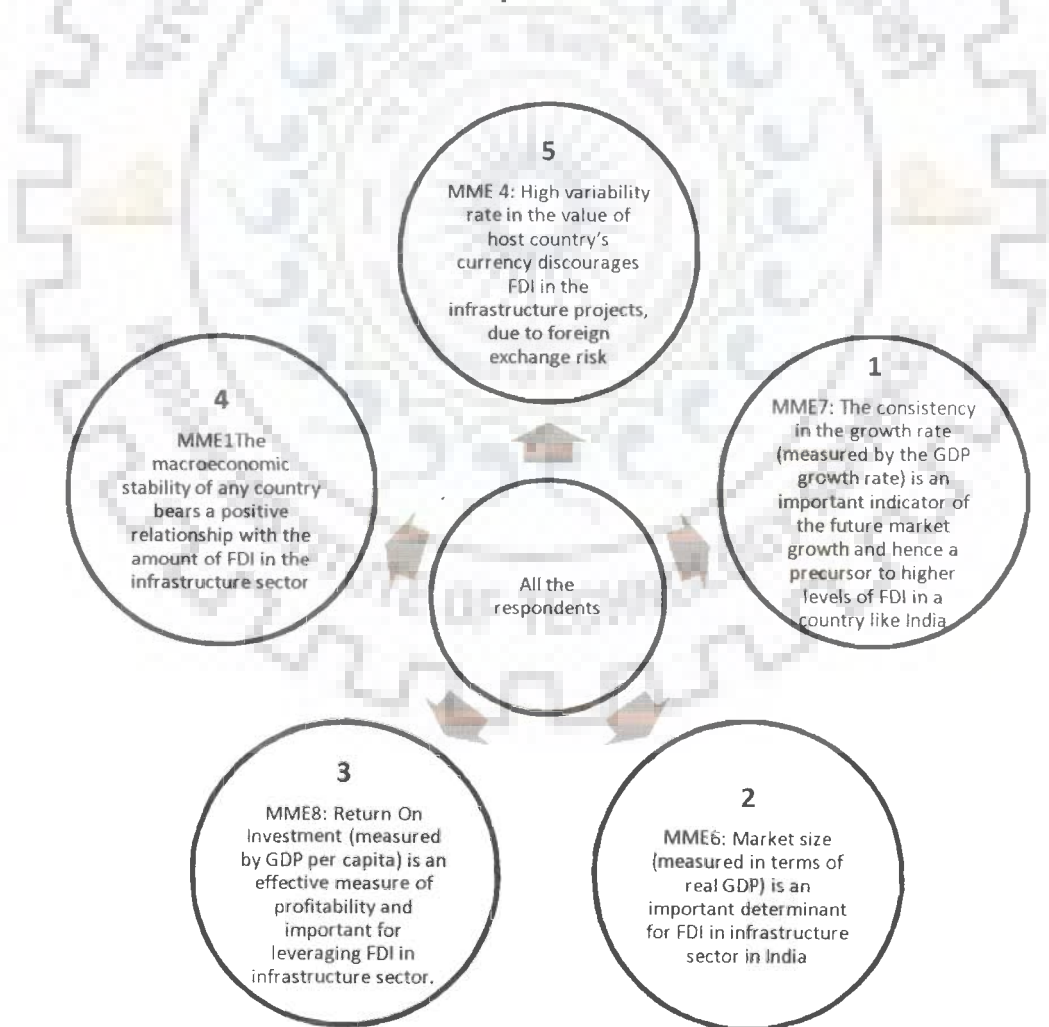


Figure 4.2: Pictorial view of the variables highly favoured by the different categories of respondents

Power	Roads	Railways	Others
<ul style="list-style-type: none"> <li>• MME 7: The consistency in the <b>growth rate</b> (measured by the GDP growth rate) is an important indicator of the future market growth and hence a precursor to higher levels of FDI in a country</li> <li>• MME6: <b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India</li> <li>• MME1: The <b>macroeconomic stability</b> of any country bears a positive relationship with the amount of FDI in the infrastructure sector</li> <li>• MME8: <b>Return On Investment</b> (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector.</li> </ul>	<ul style="list-style-type: none"> <li>• MME7: The consistency in the <b>growth rate</b> (measured by the GDP growth rate) is an important indicator of the future market growth and hence a precursor to higher levels of FDI in a country</li> <li>• MME6 <b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India</li> <li>• MME8: <b>Return On Investment</b> (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector.</li> <li>• MME1: The <b>macroeconomic stability</b> of any country bears a positive relationship with the amount of FDI in the infrastructure sector</li> </ul>	<ul style="list-style-type: none"> <li>• MME7: The consistency in the <b>growth rate</b> (measured by the GDP growth rate) is an important indicator of the future market growth and hence a precursor to higher levels of FDI in a country</li> <li>• MME6 <b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India</li> <li>• MME4: <b>High variability rate</b> in the value of <b>host country's currency</b> discourages FDI in the infrastructure projects, due to foreign exchange risk.</li> <li>• MME1: The <b>macroeconomic stability</b> of any country bears a positive relationship with the amount of FDI in the infrastructure sector</li> </ul>	<ul style="list-style-type: none"> <li>• MME7: The consistency in the <b>growth rate</b> (measured by the GDP growth rate) is an important indicator of the future market growth and hence a precursor to higher levels of FDI in a country</li> <li>• MME6 <b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India</li> <li>• MME8: <b>Return On Investment</b> (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector.</li> <li>• MME1: The <b>macroeconomic stability</b> of any country bears a positive relationship with the amount of FDI in the infrastructure sector</li> </ul>

### 4.3 BUSINESS ENVIRONMENT IN INDIA: IMPACT ON FDI

Environment related to the operation of business in any economy has been substantially highlighted in the literature studies relating to the determinants of FDI inflows. The business operating environment relates to the ease of starting a business or project in any economy and also to the Governmental/bureaucratic

support offered in achieving technical and financial closures of projects. Thus to examine the effectiveness of business related variables in the different categories, respondents were asked ten business environment related questions. All the questions, except one, were based on simple understanding of acceptance or disagreement level of the respondents. The last question was a multiple choice question enquiring about the most difficult thing encountered by the foreign firms while starting a project in India.

The views of different categories of the respondents in relation to these variables have been presented in Table 4.4. It is observed that there exists a wide gap in the preferences of the respondents belonging to different categories. Majority of the respondents of power, road and overall category have unanimously expressed their agreement for Variable BE1 and BE2, which are ranked as first and second respectively. This ranking is based on the highest mean value attained by the variables under this group. It is realized that time and cost input of management in coordinating with the Government offices is high in India and is one major cause of dejection for the foreign investors. Also, number of procedures and approvals required to start a infrastructure project is too high and acts as an effective deterrent (BE2). It can be seen that a substantial number of total respondents (90%), all the respondents in power sector (100%) and majority of respondents in roads (93%) accept the variable BE1.

Table 4.4: BE-Business environment related variables impacting the FDI inflows

Variable	Description	Sectors	Top 2 Box	Bottom 2 Box	Mean	Standard deviation
BE1	Time and cost input of management in co-ordinating with the Government offices high and acts as the major business constraint, leading to "loss of foreign investors' confidence.	Power	19	Nil	4.7D	0.5
		Roads	27	Nil	4.6	0.6
		Railways	05	Nil	4.1	1.0
		Others	25	01 (1%)	4.5	0.8
		Total	76	01 (1%)	4.6	0.7
BE2	Number of procedures /approval required before starting a infrastructure project in India are too many and too complex to be perceived by any foreign entity and act as an effective deterrent towards investment in this sector.	Power	18	Nil	4.5	0.6
		Roads	26	01 (3%)	4.5	0.8
		Railways	05	02 (25%B)	3.8	1.6
		Others	25	01 (4%)	4.6D	0.8
		Total	74	04 (5%)	4.5	0.9
BE3	Process of financial closure is too long in India and is one of the factors responsible for cost escalation in the infrastructure projects, which has a negative effect on the foreign firm's investment decision.	Power	16	01 (5%)	4.3	0.9
		Roads	04	Nil	4.3	0.7
		Railways	02	Nil	4.6	0.7
		Others	22	02 (7%)	4.3	1.0
		Total	70	03 (4%)	4.3	0.8
BE4	Most of the infrastructure projects fall within the preview of more than one State Government with an involvement of Central Government agencies in some or the other form.	Power	14	Nil	4.2	0.8
		Roads	20	03 (10%)	3.9	1.1
		Railways	06	01 (13%)	3.9	1.4
		Others	21	Nil	4.1	0.8
		Total	61	04 (5%)	4	1.0
BE5	This involvement as stated in question no. 4 leads to the multiple and conflicting roles of different Government agencies and eventually has an adverse impact on investment decision of the foreign firm.	Power	14	01 (5%)	4.1	0.9
		Roads	19	01 (3%)	3.9	1.0
		Railways	05	01 (13%)	4.0	1.5
		Others	22	01 (4%)	4.2	0.8
		Total	60	04 (5%)	4.0	1.0

Table 4.4 (Contd.)

BE6	The major implementation problems are encountered at the state level, as project implementation takes place at the State level. This particular aspect undermines the FDI promotion efforts of the Government.	Power	17	Nil	4.4C	0.7
		Roads	21	02 (7%)	3.9	0.9
		Railways	05	02 (25%)	3.8	1.6
		Others	20	Nil	4.0	0.8
		Total	63	04 (5%)	4.1	0.9
BE7	The attitude of Government officials in India towards foreign entities is quite lackadaisical (inefficient and cumbersome bureaucracies).	Power	11	03 (16%)	3.6	1.2
		Roads	16	04 (14%)	3.7	1.0
		Railways	05	02 (25%)	3.5	1.4
		Others	17	06 (21%)	3.6	1.1
		Total	49	15 (18%)	3.6	1.1
BE8	Existence of different political parties at the Centre and State results in different priorities, regarding the location of the infrastructure projects. This renders project unviable and/or delays its implementation causing frustration to the foreign investor.	Power	13	03 (16%)	3.7	1.0
		Roads	19	Nil	3.9	0.8
		Railways	08	Nil	4.5 E	0.5
		Others	15	05 (18%C)	3.6	1.2
		Total	55	08 (10%)	3.8	1.0
BE9	The overall investment climate in India is "investor friendly" and conducive for carrying out business	Power	13	01 (5%)	3.7	0.7
		Roads	17	04 (14%)	3.5	0.9
		Railways	05	01 (13%)	3.5	0.8
		Others	22	02 (7%)	3.8	0.7
		Total	57	08 (10%)	3.6	0.8
BE	All the 09 variables together		565 (75%)		4.1	1.0

There is a difference in priorities regarding the ranking of variables in Railways and Others category. Details of four most favoured variables among different categories are provided in figure 4.3 and figure 4.4. It is evident that the perception of respondents belonging to the railways category is quite different from rest of the categories. Respondents in the railways sector felt that process of financial closure is very long in India and is one important reason for cost-escalation (BE3) and as such it acts as the most deterrent factor towards FDI inflows. This variable also appears in the list of the most agreed variables of the



rest of the categories but ranks usually at the third or fourth place. One substantial change seen in the railways categories is the appearance of the variable BE8 which otherwise do not figure in the top four agreed variables of the other categories. The above analysis makes it evident that variables significantly impacting the FDI inflows in this group are – BE1, BE2, BE3, BE6 and BE5 the mean value attained by these variables under different categories is more than 4.

The average mean attained by the Business group variables as a total is 4.1 and standard deviation is 1.0. This conveys that substantial number of respondents (75%) agree to all the variables as stated under this group (Table 4.4).

The second part of the question in this group was posed to enquire about the most difficult thing faced by the foreign investors while interacting with the Government offices in India. Out of the five choices the two most agreed variables by the total respondents are “lack of accountability” (76% of respondents) and “lack of right skills and capacity” (63% of respondents). These two variables have been highlighted as the greatest deficiency of the Indian bureaucratic system. The split detail within different categories is presented in the table below (BE10).

**BE10: The two most difficult things faced by any foreign firms while interacting with Government offices in India**

Power	Roads	Railways	Others	Total
Lack of transparency (15)	Lack of right skills and capacity (22)	Lack of accountability (06)	Lack of accountability (23)	Lack of accountability (64; 76%)
Lack of accountability (14)	Lack of accountability (21)	Lack of Corporate Governance (05)	Lack of right skills and capacity (16)	Lack of right skills and capacity (53; 63%)

**Note:** Figures in parentheses depict the number of respondents in agreement with the variable

Figure 4.3 and Figure 4.4 elaborate the four most agreed business variable under different categories that affect the FDI inflow in the infrastructure sector in India.

**Figure 4.3: Pictorial view of the variables highly favoured by the total respondents**



**Figure 4.4: Pictorial view of the business variables highly favoured by the different categories of respondents**

Power	Roads	Railways	Others
<ul style="list-style-type: none"> <li>• BE1: Time and cost input of management in co-ordinating with the Government offices is high and acts as the major business constraint, leading to "loss of foreign investors' confidence</li> <li>• BE2: Number of procedures /approval required before starting a infrastructure project in India are too many and too complex to be perceived by any foreign entity and act as an effective deterrent towards investment in this sector</li> <li>• BE6: The major implementation problems are encountered at the state level, as project implementation takes place at the State level. This particular aspect undermines the FDI promotion efforts of the Government</li> <li>• BE3: Process of financial closure is too long in India and is one of the factors responsible for cost escalation in the infrastructure projects, which has a negative effect on the foreign firm's investment decision</li> </ul>	<ul style="list-style-type: none"> <li>• BE1: Time and cost input of management in co-ordinating with the Government offices is high and acts as the major business constraint, leading to "loss of foreign investors' confidence</li> <li>• BE2: Number of procedures /approval required before starting a infrastructure project in India are too many and too complex to be perceived by any foreign entity and act as an effective deterrent towards investment in this sector</li> <li>• BE3: Process of financial closure is too long in India and is one of the factors responsible for cost escalation in the infrastructure projects, which has a negative effect on the foreign firm's investment decision</li> <li>• BE6: The major implementation problems are encountered at the state level, as project implementation takes place at the State level. This particular aspect undermines the FDI promotion efforts of the Government</li> </ul>	<ul style="list-style-type: none"> <li>• BE3: Process of financial closure is too long in India and is one of the factors responsible for cost escalation in the infrastructure projects, which has a negative effect on the foreign firm's investment decision</li> <li>• BE8: Existence of different political parties at the Centre and State results in different priorities, regarding the location of the infrastructure projects. This renders project unviable and/or delays its implementation causing frustration to the foreign investor</li> <li>• BE1: Time and cost input of management in co-ordinating with the Government offices is high and acts as the major business constraint, leading to "loss of foreign investors' confidence.</li> <li>• BE5: This involvement as stated in question no. 4 leads to the multiple and conflicting roles of different Government agencies and eventually has an adverse impact on investment decision of the foreign firm.</li> </ul>	<ul style="list-style-type: none"> <li>• BE2: Number of procedures /approval required before starting a infrastructure project in India are too many and too complex to be perceived by any foreign entity and act as an effective deterrent towards investment in this sector</li> <li>• BE1: Time and cost input of management in co-ordinating with the Government offices is high and acts as the major business constraint, leading to "loss of foreign investors' confidence</li> <li>• BE3: Process of financial closure is too long in India and is one of the factors responsible for cost escalation in the infrastructure projects, which has a negative effect on the foreign firm's investment decision.</li> <li>• BE5: This involvement as stated in question no. 4 leads to the multiple and conflicting roles of different Government agencies and eventually has an adverse impact on investment decision of the foreign firm.</li> </ul>

#### 4.4 IMPACT OF EXTENT OF CORRUPTION ON FDI INFLOWS

The purpose of examining this variable was to understand that what form of corruption acts as greatest impediment towards FDI in infrastructure sector in India. Apart from this during analysis of secondary data on flow of FDI in power and road sector in chapter 3 it was observed that major FDI destinations were one located in the southern part of the country. The common debates in the think tank has often highlighted that working conditions in southern part of the country are easy due to less corrupt bureaucracy. It was important to understand the significance of this perception among the community therefore respondents were asked to express their level of agreement related to the variables specified in the Table 4.5.

A vast majority of the respondents about 79% are of the view that “corruption is one major constraint” impeding FDI in infrastructure sector. As it is evident that any infrastructure projects before construction and operation requires number of approvals and there are multiple institutions involved both at the Central and State level. This leads to frequent interaction with the Government agencies which are otherwise labeled as cumbersome and involves lot of red tapism. The information generated by the responses is compiled and presented in the Table 4.5. An inspection of this information would bring out that all the categories of respondents unanimously agree with the variable CE1 (average mean for all the variables is more than 4) except respondents from road sector, average mean in this case is 3.8 (3= neutral and 4= agree). Regarding North versus South perception of working environment majority of respondents’ preference was to remain neutral to the variable except the respondents from railways as almost half of the respondents have shown inclination towards the acceptance level and others preferred to remain neutral. Ironically, the answer to the succeeding question which was asked to understand the difference in level of transparency in business operations in Northern and Southern India, majority of the respondents agreed to the variable. This agreement reflects that the one major reason for FDI pouring in the Southern States of the Country is the existence of clean working conditions (the average mean for the whole set of respondents is 4.3).

Table 4.5: CE Corruption Environment related variables impacting the investment

Variable	Description	Sectors	Top 2 Box	Bottom 2 Box	Mean	Standard deviation
CE1	Corruption in India is perceived as one of the major investment constraints in Infrastructure projects, as these projects involve multiple agencies and interaction with these <b>Government agencies</b> is quite frequent.	Power	18 (95%)	Nil	4.5	0.6
		Roads	20 (69%)	04 (14%)	3.8	1.0
		Railways	07 (88%)	Nil	4.4	0.7
		Others	21 (75%)	02 (7%)	4.2	1.1
		Total	66 (79%)	06 (7%)	4.1	1.0
CE2	There is a clear divide in <b>North versus South</b> perception of "work-friendly" environment.	Power	10 (53%)	04 (21%)	3.4	1.2
		Roads	12 (41%)	09 (31%)	3.3	1.2
		Railways	04 (50%)	Nil	3.9E	1.0
		Others	06 (21%)	10 (36%)	2.9	1.2
		Total	32 (38%)	23 (27%)	3.2	1.2
CE3	South Indian States have <b>clean working conditions</b> as compared to, many of the otherwise "resourceful and facilities starving", North Indian States. This is one strong reason for more foreign investment pouring in infrastructure projects in southern region of the country.	Power	08 (42%)	04 (21%)	4.3	0.9
		Roads	12 (41%)	10 (34%)	4.3	0.7
		Railways	03 (38%)	01 (13%)	4.6	0.7
		Others	08 (29%)	10 (36%)	4.3	1.0
		Total	31 (37%)	25 (30%)	4.3	0.8

Table 4.6: Respondents perception regarding the form of Corruption

Forms of Corruption	No. of respondents holding different views regarding the forms of corruption				
	Total	Power	Roads	Railways	Others
	Base				
	84	19	29	08	28
1. Bribery	77 (92%)	18 (95%)	28 (97%)	07 (88%)	24 (86%)
2. Extortion money	5 (6%)	-	1 (3%)	1 (13%)	3 (11%)
3. Fraud	27 (32%)	6 (32%)	7 (24%)	1 (13%)	13 (46%)

**Table 4.7: Respondents perception regarding the most corrupt stage in the project life cycle**

During Which Of The Following Stages Corruption is Most Prevalent In The Infrastructure Projects In India?	No. of respondents holding different views regarding the variable				
	Total	Power	Roads	Railways	Others
	Base				
	84	19	29	08	28
<b>1. Pre-qualification</b>	32 (38%)	08 (42%)	12 (41%)	01 (13%)	11 (39%)
<b>2. Project execution</b>	<b>65</b> <b>(77%)</b>	<b>13</b> <b>(68%)</b>	<b>23</b> <b>(79%)</b>	<b>07</b> <b>(88%)</b>	<b>22</b> <b>(79%)</b>
<b>3. Dispute resolution</b>	43 (51%)	11 (58%)	16 (55%)	04 (50%)	12 (43%)

Respondents were also asked to indicate their views regarding the different forms of corruption practiced in the country. A vast majority of them (92%) is of the view that “bribery” is the most practiced and contrary to the earlier response, interaction with few of the respondents communicated that it is easy for the domestic private firms to accomplish their task in the government department by greasing the hands of the bureaucrat and other lower level employees. It was also revealed to the researcher that this form of corruption has almost become an unstructured practice which is likely to be covered before project execution in almost all the projects. This is also one big reason cited for the choice of foreign investors to invest in Indian infrastructure projects with equity in domestic company and to shy away from individual greenfield projects. The next variable was posed to enquire that at what stage of the project life cycle, is corruption most prevalent. The analysis of the responses as disclosed in the Table 4.7 reveals that 77% of the total respondents are of the view that at the project execution stage corruption is most prevalent. On enquiry from few of the respondents from the road sector it was gathered that during project execution stage there are lot of post-bid adjustments and manipulations which results in increased red-tapism and bribery. As firms are usually amidst the project construction stage and any delays or stagnation at this stage results in cost escalation which can eventually result in great loss to the firms, to avoid this firms indulge in the unethical practice of bribery. There is also a slight acceptance of the respondents (51%) to the question that there is substantial corruption at the dispute resolution stage.

## 4.5 Investment Environment

The purpose of this section is to assess the overall effectiveness of the investment environment as existing in India, in creating impact on the FDI investment decisions in the infrastructure sector. Various factors as examined are Investment promotion institutions, labour policies, taxes, existing infrastructure facilities, incentives etc. Several prior scholastic studies have highlighted the importance of country-level environment for private investment in infrastructure sector. There are also studies conducted by the international development agencies which suggest that project promoters and developers use country-level analysis for making investment decisions in any particular economy. Based on these conclusions this section of the research posed several questions to the Respondents to investigate for the effect of various policy measures like incentives, dual taxation treaties, Government's spending, labour laws and regulations on the investment decisions of the foreign investors.

Table 4.8 summarizes the findings of the survey questions related to investment environment. The results highlighted that the type and degree of investment incentives the country provides for the foreign enterprises, plays an extremely important role in shaping the investment decisions. Among the various incentives offered by the Government concessions and tax holidays feature prominently in investor's decision making and enhance the attractiveness of the country as an important investment destination. The other important incentive which most of the investor's take into account is the Viability Gap Funding scheme. The scheme provides an element of Central Government funding upto 20% and can go upto 40% in special cases. The significant thing happening in this case is that Government acts as guarantor for 90% of the debt raised for the project. In this sense, an investor is more inclined to invest in projects which have VGF as an element of funding.

The variable that features as second prominent choice of respondents is the Government's spending rate in the sector. Potential investor's take into account the amount of public expenditure meant for infrastructure spending in a particular year. This acts as proxy for the commitment level of Government towards the development of infrastructure sector. Apart from the variables acting as drivers the respondents also identified two most deterrent factors in reducing the investment

environment competitiveness of the country. The results highlighted that labour laws, rules and regulations applicable in India are too complex and rigid. International literature has stressed that simple and flexible laws and rules acts as efficiency enhancers in increasing the foreign investments in any economy. Apart from this, good infrastructure availability is other deterrent factor for attracting FDI. Good infrastructure is one of the primary requirements for the growth of any economy. Efficient road connectivity and rail-road connectivity has been identified as the two most unmet infrastructure needs in India which affect the growth of economy and in turn affect the investment in other infrastructure sectors. Even according to one of the studies a well-developed infrastructure, in particular transport and telecommunications are key determinant in attracting FDI (Borensztein et al. 1998).

**Table 4.8: Investment environment impact on investment decision**

Variable	Description	Sectors	Top 2 Box	Bottom 2 Box	Mean	Standard deviation
IE1	The present <b>investment scenario</b> in the country is quite "investor-friendly" for FDI in the infrastructure sector.	Power	16 (84%)	01 (5%)	3.9D	0.7
		Roads	20 (69%)	03 (10%)	3.6	0.8
		Railways	04 (50%)	02 (25%E)	3.3	0.9
		Others	20 (71%)	Nil	3.9D	0.7
		Total	60 (71%)	06 (7%)	3.7	0.8
IE2	The <b>Investment commission and Foreign investment Promotion board</b> are affective in building the brand image of the country (India) for infrastructure investment.	Power	07 (37%)	08 (42%)	2.7	1.2
		Roads	11 (38%)	11 (38%)	3.0	1.0
		Railways	02 (25%)	02 (25%)	3.1	1.0
		Others	13 (46%)	06 (21%)	3.3	1.0
		Total	33 (39%)	27 (32%)	3.1	1.1
IE3	Increase in <b>domestic credit</b> to the local infrastructure firms enhances the confidence of foreign investors in this sector and as such leave a positive impact on the investment decisions of the foreign firms.	Power	16 (84%)	01 (5%)	4.1	0.8
		Roads	23 (79%)	01 (3%)	4.0	0.8
		Railways	07 (88%)	01 (13%)	4.1	1.0
		Others	20 (71%)	01 (4%)	4.1	0.9
		Total	66 (79%)	04 (5%)	4.1	0.8



Table 4.8 (cont'd)

IE 4	Labour laws, rules, regulations and procedures are too complex and difficult to be followed especially by foreign investors, which discourage the investment from this source.	Power	15 (79%)	03 (16%)	4.2	1.1
		Roads	25D (86%)	01 (3%)	4.3D	0.8
		Railways	04 (50%)	01 (13%)	3.6	1.1
		Others	21 (75%)	03 (11%)	4.1	1.0
		Total	65 (77%)	08 (10%)	4.2	1.0
IE 5	The existence of <b>double-taxation avoidance treaty</b> between host and home country plays important role in attracting FDI in infrastructure sector in India (India has DTAA, Double Taxation Avoidance Agreement with 69 countries).	Power	12 (63%)	05 (26%)	3.7	1.2
		Roads	20 (69%)	03 (10%)	3.9	1.0
		Railways	05 (63%)	02 (25%)	3.6	1.5
		Others	21 (75%)	02 (7%)	4.0	0.9
		Total	58 (69%)	12 (14%)	3.9	1.0
IE 6	The ease of <b>conversion or transfer of currency</b> in India is a favourable feature towards attracting FDI in infrastructure sector as revenues generated are in local currency.	Power	15 (79%)	01 (5%)	3.9	0.8
		Roads	25 (86%)	Nil	4.0	0.5
		Railways	06 (75%)	01 (13%)	3.9	1.0
		Others	21 (75%)	01 (4%)	4.0	0.8
		Total	67 (80%)	03 (4%)	4.0	0.7
IE 7	In case of projects implemented via Special Purpose Vehicle, <b>dividends</b> are being taxed twice first at the level of the project-specific SPVs and then at the holding company level. This factor discouraging foreign investors.	Power	10 (53%)	04 (21%)	3.4	1.2
		Roads	15 (52%)	05 (17%)	3.5	0.9
		Railways	02 (25%)	03 (38%)	3.0	1.4
		Others	10 (36%)	06 (21%)	3.3	1.1
		Total	37 (44%)	18 (21%)	3.4	1.1
IE 8	<b>Global sourcing</b> (as prevalent in India) for the procurement of capital and revenue inputs enhances the attractiveness of the infrastructure projects for FDI	Power	12 (63%)	01 (5%)	4.0C E	1.0
		Roads	11 (38%)	04 (14%)	3.3	0.8
		Railways	05 (63%)	02 (25%)	3.8	1.3
		Others	10 (36%)	05 (18%)	3.4	1.0
		Total	38 (45%)	12 (14%)	3.5	1.0

Table 4.8 (cont'd)

IE 9	For implementing any infrastructure project, the existing supporting infrastructure (communication, transportation and accessibility to resources) is important factor to decide upon the foreign investment in this sector. In India the existing supporting infrastructure is very poor.	Power	16 (84%)	01 (5%)	4.2	1.0
		Roads	23 (79%)	Nil	4.1	0.7
		Railways	06 (75%)	01 (13%)	3.9	1.0
		Others	23 (82%)	01 (4%)	4.0	0.7
		Total	68 (81%)	03 (4%)	4.1	0.8
IE10	Policy incentives play important role in attracting FDI to the Infrastructure projects	Power	19 (100%)	Nil	4.7	0.5
		Roads	28 (97%)	Nil	4.8	0.5
		Railways	07 (88%)	01 (13%)	4.5	1.1
		Others	27 (97%)	Nil	4.6	0.6
		Total	81 (96%)	01 (1%)	4.7	0.6
IE11	Increase in the <b>Government spending</b> on infrastructure development increases the future prospects of FDI in the sector in any economy	Power	17 (89%)	Nil	4.4	0.7
		Roads	23 (79%)	Nil	4.1	0.7
		Railways	07 (88%)	Nil	4.0	0.9
		Others	25 (89%)	01 (13%)	4.4	0.8
		Total	72 (86%)	02 (2%)	4.3	0.8
IE12	Decrease in <b>Government spending</b> in the infrastructure segment in India has negative effect on FDI flow to the sector.	Power	06 (32%)	06 (32%)	3.1	0.9
		Roads	08 (28%)	07 (24%)	3.0	0.7
		Railways	04 (50%)	03 (38%)	3.3	1.5
		Others	17 (61%)	03 (11%)	3.6 BC	0.9
		Total	35 (42%)	19 (23%)	3.3	0.9
IE13	Identifying and nurturing long-term relationship with competent and trustworthy <b>domestic partner</b> is quite difficult in case of joint ventures in India.	Power	10 (53%)	05 (26%)	3.4	1.2
		Roads	13 (45%)	08 (28%)	3.3	1.2
		Railways	05 (63%)	01 (13%)	3.8	1.4
		Others	13 (46%) <sup>1</sup>	05 (18%)	3.6	1.1
		Total	41 (49%)	19 (23%)	3.5	1.2

**IE14: Two most lucrative incentives effective in attracting FDI to infrastructure development in India**

Power	Roads	Railways	Others	Total
Concessions and tax holidays (17; 89%)	Concessions and tax holidays (24; 83%)	Concessions and tax holidays (05; 63%)	Concessions and tax holidays (21; 75%)	Concessions and tax holidays (67; 80%)
Viability Gap Funding scheme (12; 63%)	Viability Gap Funding scheme (24; 83%)	Viability Gap Funding scheme (05; 63%)	Viability Gap Funding scheme (21; 75%)	Viability Gap Funding scheme (62; 74%)

Note: Figures in parentheses depict the number of respondents in agreement with the variable

**IE15: Top two deficiencies in infrastructure availability hindering the FDI inflow in infrastructure projects**

Power	Roads	Railways	Others	Total
Efficient road connectivity (15; 79%)	Efficient road connectivity (27; 93%)	Efficient road connectivity (04; 50%)	Efficient road connectivity (22; 79%)	Efficient road connectivity (68; 81%)
Connectivity to sources of fuel (13; 68%)	Rail- road connectivity (19; 66%)	Rail-road connectivity (03; 38%)	Water availability (14; 50%)	Rail- road connectivity (45; 54%)

Note: Figures in parentheses depict the number of respondents in agreement with the variable

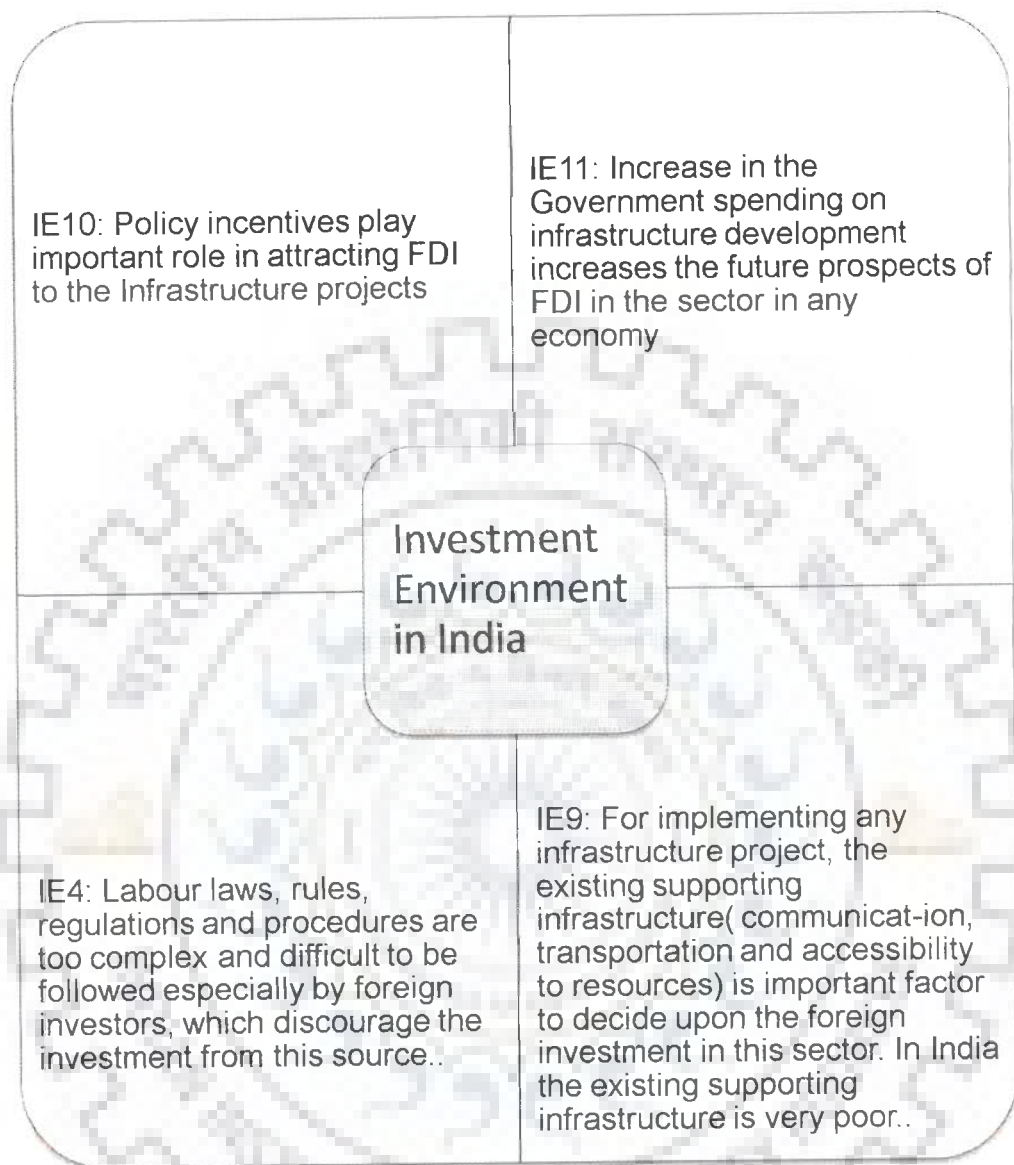
The analysis of responses across the three different sectors in discussion gives different sectoral perspective about the factors that influence investor's decision regarding the investment in the sector. In all categories policy incentives (IE10) acts as the most significant pull factor for FDI. In the rest top three positions there is lack of consensus among the sectors regarding the choice of variables. The respondents from power sector highlighted that major problems are encountered at the State level which are actually responsible for the implementation of projects. This further highlights the importance of the micro environment at the State departments and offices which feature in the investor's list of determinants. The bureaucrat's acceptability towards foreign sector involvement and their willingness and enthusiastic participation in implementation activities is significantly regarded by the foreign investors and can leverage the dynamism of India's working environment leading to better growth. This particular aspect is also highly favoured by the respondents of the road sector. Figure 4.5

discloses in detail the elements playing vital role in effecting the investment decisions in the three sectors.

**Figure 4.5: Pictorial view of the investment variables highly favoured by the different categories of respondents**

POWER	ROADS	RAILWAYS	OTHERS
<ul style="list-style-type: none"> <li>• IE10: Policy incentives play important role in attracting FDI to the Infrastructure projects</li> <li>• IE11: Increase in the Government spending on infrastructure development increases the future prospects of FDI in the sector in any economy</li> <li>• IE6: The ease of conversion or transfer of currency in India is a favourable feature towards attracting FDI in infrastructure sector as revenues generated are in local currency</li> <li>• IE3: Increase in domestic credit to the local infrastructure firms enhances the confidence of foreign investors in this sector and as such leave a positive impact on the investment decisions of the foreign firms</li> </ul>	<ul style="list-style-type: none"> <li>• IE10: Policy incentives play important role in attracting FDI to the Infrastructure projects</li> <li>• IE4: Labour laws, rules, regulations and procedures are too complex and difficult to be followed especially by foreign investors, which discourage the investment from this source</li> <li>• IE11: Increase in the Government spending on infrastructure development increases the future prospects of FDI in the sector in any economy</li> <li>• IE6: The ease of conversion or transfer of currency in India is a favourable feature towards attracting FDI in infrastructure sector as revenues generated are in local currency</li> </ul>	<ul style="list-style-type: none"> <li>• IE10: Policy incentives play important role in attracting FDI to the Infrastructure projects</li> <li>• IE8: Global sourcing (as prevalent in India) for the procurement of capital and revenue inputs enhances the attractiveness of the infrastructure projects for FDI</li> <li>• IE11: Increase in the Government spending on infrastructure development increases the future prospects of FDI in the sector in any economy.</li> <li>• IE5: The existence of double-taxation avoidance treaty between host and home country plays important role in attracting FDI in infrastructure sector in India (India has DTAA, Double Taxation Avoidance Agreement with 69 countries)...</li> </ul>	<ul style="list-style-type: none"> <li>• IE10: Policy incentives play important role in attracting FDI to the Infrastructure projects</li> <li>• IE11: Increase in the Government spending on infrastructure development increases the future prospects of FDI in the sector in any economy</li> <li>• IE3: Increase in domestic credit to the local infrastructure firms enhances the confidence of foreign investors in this sector and as such leave a positive impact on the investment decisions of the foreign firms.</li> <li>• IE5: The existence of double-taxation avoidance treaty between host and home country plays important role in attracting FDI in infrastructure sector in India (India has DTAA, Double Taxation Avoidance Agreement with 69 countries).</li> </ul>

**Figure 4.6: Pictorial view of the Investment variables highly favoured by the different categories of respondents**



#### 4.6 INSTITUTIONS AND IMPACT ON FDI INFLOWS

Numerous theories are there to explain FDI behavior with the application of institutional theory (Trevino et al, 2002) from the strategic management literature. These theories lay importance on the systems and institutions enveloping any sector or organizations that influence the decision-making process of the firms. In this study an attempt is made to examine the affect of institutional variables as present in India on the FDI inflow in the infrastructure sector. The respondents were asked about 20 questions to identify and examine the shortcomings in India's institutional environment that are impeding the country's competitiveness and FDI growth in the sector in the country. Almost 95% of the

total respondents agreed that sensitive and reliable institutional and regulatory environment (IRE1) is crucial to support an economy's effort to effectively compete for FDI in the infrastructure sector in an integrated global economy. There was also 100% agreement over the significance of the transparent and independent institutions (IRE2) in making the country's regulatory environment competitive. Further the results point to the respondent's notable inclination towards the institution of Special Purpose Vehicles (IRE11). About 71% of the survey responses agreed that projects which are bid through SPVs are highly attractive to the foreign as well as domestic private investors as these facilitates the approval of various clearances required for the execution of the projects. It is viewed as an important indicator of Government's readiness to encourage private investment. The other institutional obstacle highlighted by the respondents in all the categories is the number of statutory and non-statutory clearances required to reach financial closure in infrastructure projects in India (IRE10). For instance, according to the database maintained by the Investment Commission of India, there are as many as 24 approvals required to achieve techno-economic and environmental clearances and as many as 21 Central and State level departments and agencies are involved for according clearances/sanctions for setting up a Thermal Power Project in India. These are the obstacles which are derived from the era when India was functioning more as a closed economy. One important drivers of the investment suggested by the results is the process of standardizing the project procurement documents (IRE6). Most of the respondents (82%) are of the view that document standardization leads to transparency and fairness in the bureaucratic systems and processes.

In globalized world economy institutional factors play crucial role in influencing international investors in distinguishing one economy from other as the choice of investment destination. The analysis of present section highlights that India's potential for increased competitiveness is high but there are some institutional hindrances which obstruct the country's path to improved competitiveness. The survey examination (Table 4.9) propose following as the major institutional obstacles<sup>1</sup>

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<sup>1</sup> Those variable are identified as obstacles for which the total respondents scoring is more than 50% in top-to-bottom

- A. The regulatory regime in the country operating in the infrastructure sector is not really functioning as an autonomous institution as they have not been able to dissociate themselves completely from the political influence (IRE3).
- B. It is difficult to be able to get the user charges recovered from the end-users, the institutional arrangement is not much effective in this regard (IRE8 and IRE9)
- C. The existence of independent judiciary in the country is an effective instrument for getting rules and laws implemented but the ease with which all or any stakeholder can file a suit or petition, can add heavily to the cost of investment and as such is a major cause of concern to the investors (IRE12 and IRE13).
- D. The institutional arrangement lacks the effectiveness to avoid conflict among the stakeholders and also in case of conflict resolution the degree of application and speed of rulings is very low<sup>2</sup> (IRE16 and IRE17).

The cross-sectoral analysis gives somewhat different sequence of the variables highly favored by the different categories respondents. Figure 4.7 and 4.8 provides the detail of the variables preferred by the respondents. The two variables that top the list of power, roads and other sector categories are same as that in the total respondents' category i.e IRE1 and IRE2. In case of the railways though IRE2 tops the list but railway sector respondent's view about the second and fourth most favored variable is different it is IRE4 and IRE6 respectively. The variable IRE10 appears as third most favorable for the power and other category respondents while at the fourth place lot of turbulence and disagreement is seen regarding the variable choice among the different categories.

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<sup>2</sup> The statement is cited as the explanation elaborated by one of the respondent from the road sector firm.

**Table 4.9: Respondents perception regarding the institutional and regulatory environment**

Variable	Description	Sectors	Top 2 Box	Bottom 2 Box	Mean	Standard deviation
IRE1	FDI in the infrastructure sector is sensitive to the quality of the <b>institutional and regulatory set-up</b> in any country	Power	19 (100%)	Nil	4.8	0.4
		Roads	28 (97%)	01 (3%)	4.7	0.5
		Railways	07 (88%)	Nil	4.4	1.1
		Others	26 (93%)	02 (7%)	4.8	0.6
		Total	80 (95%)	03 (4%)	4.7	0.6
IRE2	Transparent and <b>independent regulatory institutions</b> in the individual sector encourage the foreign investment in that sector in any country	Power	19 (100%)	Nil	4.9	0.3
		Roads	29 (100%)	Nil	4.8	0.4
		Railways	08 (100%)	Nil	5.0	0.0
		Others	28 (100%)	Nil	4.7	0.5
		Total	84 (100%)	Nil	4.8	0.4
IRE 3	The <b>regulatory regime</b> (in power sector) in India is very stable and regulatory authorities /institutions work in an autonomous manner (without any political control and influence)	Power	06 (32%)	09 (47%)	2.7	1.2
		Roads	09 (31%)	08 (28%)	2.9	1.0
		Railways	02 (25%)	04 (50%)	2.6	1.4
		Others	10 (36%)	11 (39%)	2.8	1.2
		Total	27 (32%)	32 (38%)	2.8	1.1
IRE 4	Having single <b>regulatory authority</b> for the entire country, as against the present practice of Central and State regulatory institutions (as in case of power sector), will definitely enhance the future investment prospects in the sector in India.	Power	08 (42%)	03 (16%)	3.6	1.3
		Roads	18 (62%)	04 (14%)	3.6	1.0
		Railways	08 (100% BCE)	Nil	4.5CE	0.5
		Others	12 (43%)	08 (29%)	3.2	1.3
		Total	46 (55%)	15 (18%)	3.6	1.2
IRE 5	The absence of <b>regulatory body</b> for Road sector in India discourages investment in sector	Power	05 (26%)	03 (16%)	3.2	1.0
		Roads	16 (55%)	07 (24%)	3.5	1.1
		Railways	04 (50%)	02 (25%)	3.3	1.3
		Others	14 (50%)	04 (14%)	3.4	0.9
		Total	39 (46%)	16 (19%)	3.4	1.0



Table 4.9 (cont'd)

IRE 6	Preparation of <b>standard documents</b> such as Model Concession Agreement (highways), Pre-bid qualification methodology and procurement process (power sector) are effective in encouraging FDI in the infrastructure sector in India	Power	15 (79%)	Nil	4.4	0.8
		Roads	25 (86%)	01 (3%)	4.3	0.9
		Railways	07 (88%)	01 (13%)	4.5	1.1
		Others	22 (79%)	02 (7%)	4.2	1.1
		Total	69 (82%)	04 (5%)	4.3	1.0
IRE 7	The institutional framework as discussed in these standard documents is effective in making the <b>competition</b> fair and transparent	Power	09 (47%)	05 (26%)	3.2	1.2
		Roads	14 (48%)	06 (21%)	3.3	1.0
		Railways	06 (75%)	01 (13%)	4.3	1.2
		Others	13 (46%)	07 (25%)	3.4	1.1
		Total	42 (50%)	19 (23%)	3.4	1.1
IRE 8	Recovery of <b>user-charges</b> is one of the biggest hurdles in making any infrastructure project viable.	Power	14 (74%)	02 (11%)	4.1	1.2
		Roads	23 (79%)	05 (17%)	4.0	1.3
		Railways	04 (50%)	01 (13%)	3.6	1.1
		Others	24 (86%)	02 (7%)	4.3	1.0
		Total	65 (77%)	10 (12%)	4.1	1.1
IRE 9	Institutional framework in India provides effective security mechanism for the recovery of <b>user-charges</b> in infrastructure projects	Power	05 (26%)	08 (42%)	2.8	0.8
		Roads	12 (41%)	12 (41%)	2.9	1.0
		Railways	03 (38%)	03 (38%)	2.9	1.2
		Others	08 (29%)	15 (54%)	2.6	1.1
		Total	28 (33%)	38 (45%)	2.8	1.0
IRE10	Approvals/ clearances required to reach <b>financial closure</b> in infrastructure projects are very cumbersome and require interaction with number of Government offices, giving rise to red-tapism.	Power	19 (100%)	Nil	4.7C	0.5
		Roads	20 (69%)	04 (14%)	4.0	1.1
		Railways	07 (88%)	Nil	4.5	0.8
		Others	25 (89%)	01 (4%)	4.4	0.8
		Total	71 (85%)	05 (6%)	4.3	0.9

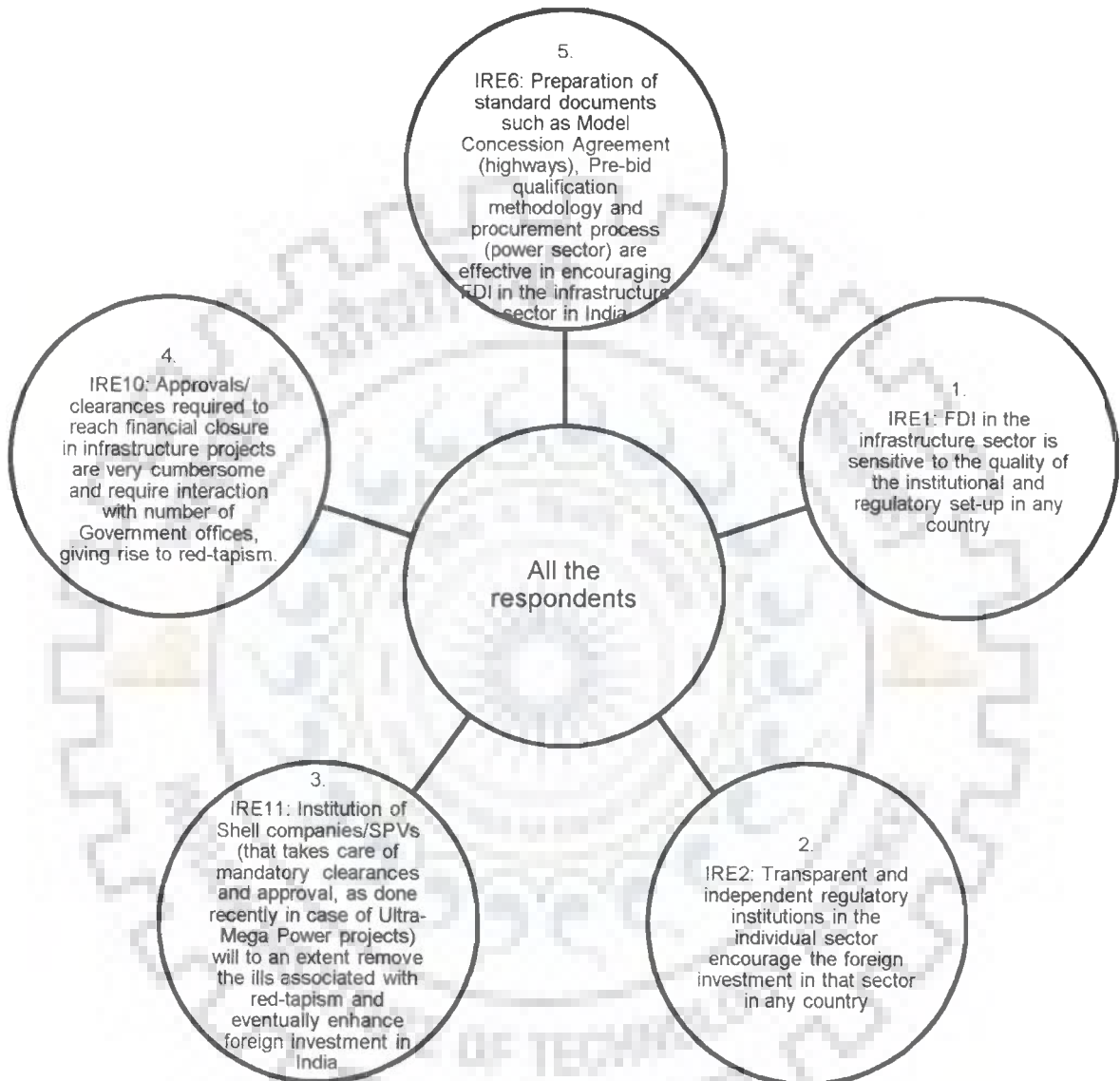
Table 4.9 (cont'd)

IRE11	Institution of Shell companies/SPVs (that takes care of mandatory clearances and approval, as done recently in case of Ultra-Mega Power projects) will to an extent remove the ills associated with red-tapism and eventually enhance foreign investment in India	Power	18 (95%)	Nil	4.5	0.6
		Roads	26 (90%)	01 (3%)	4.3	0.8
		Railways	06 (75%)	01 (13%)	4.0	1.1
		Others	21 (75%)	02 (7%)	4.1	1.0
		Total	71 (85%)	04 (5%)	4.3	0.8
IRE12	Effective rule of Law (reliable and stable legal institutions), is an important factor in India, responsible for attracting FDI in the infrastructure sector	Power	15 (79%)	02 (11%)	3.9	0.9
		Roads	22 (76%)	01 (3%)	4.0	0.8
		Railways	06 (75%)	02 (25%)	3.9	1.2
		Others	20 (71%)	01 (4%)	3.9	0.9
		Total	63 (75%)	06 (7%)	3.9	0.9
IRE13	Easy accessibility of the judicial system by any and every interest group deters FDI in the sector in India (as compared to China).	Power	09 (47%)	03 (16%)	3.4	1.0
		Roads	15 (52%)	04 (14%)	3.5	0.9
		Railways	06 (75%)	02 (25%)	4.0	1.3
		Others	14 (50%)	08 (29%)	3.3	1.3
		Total	44 (52%)	17 (20%)	3.5	1.1
IRE 14	Making the projects tradable/freely transferable (allowing the project developer to exit, at any stage), would increase the likelihood of the FDI in the sector in India	Power	13 (68%)	04 (21%)	3.7	1.1
		Roads	20 (69%)	04 (14%)	3.8E	1.1
		Railways	03 (38%)	02 (25%)	3.0	1.4
		Others	11 (39%)	10 (36%)	3.2	1.1
		Total	47 (56%)	20 (24%)	3.5	1.2
IRE 15	The laws governing various infrastructure sectors in India do not permit the participation of the project developers in the tariff-determination, which discourages the FDI in the sector, in the country.	Power	11 (58%)	03 (16%)	3.6	1.0
		Roads	18 (62%)	03 (10%)	3.6	0.8
		Railways	04 (50%)	03 (38%)	3.3	1.2
		Others	12 (43%)	06 (21%)	3.4	1.1
		Total	45 (54%)	15 (18%)	3.5	1.0

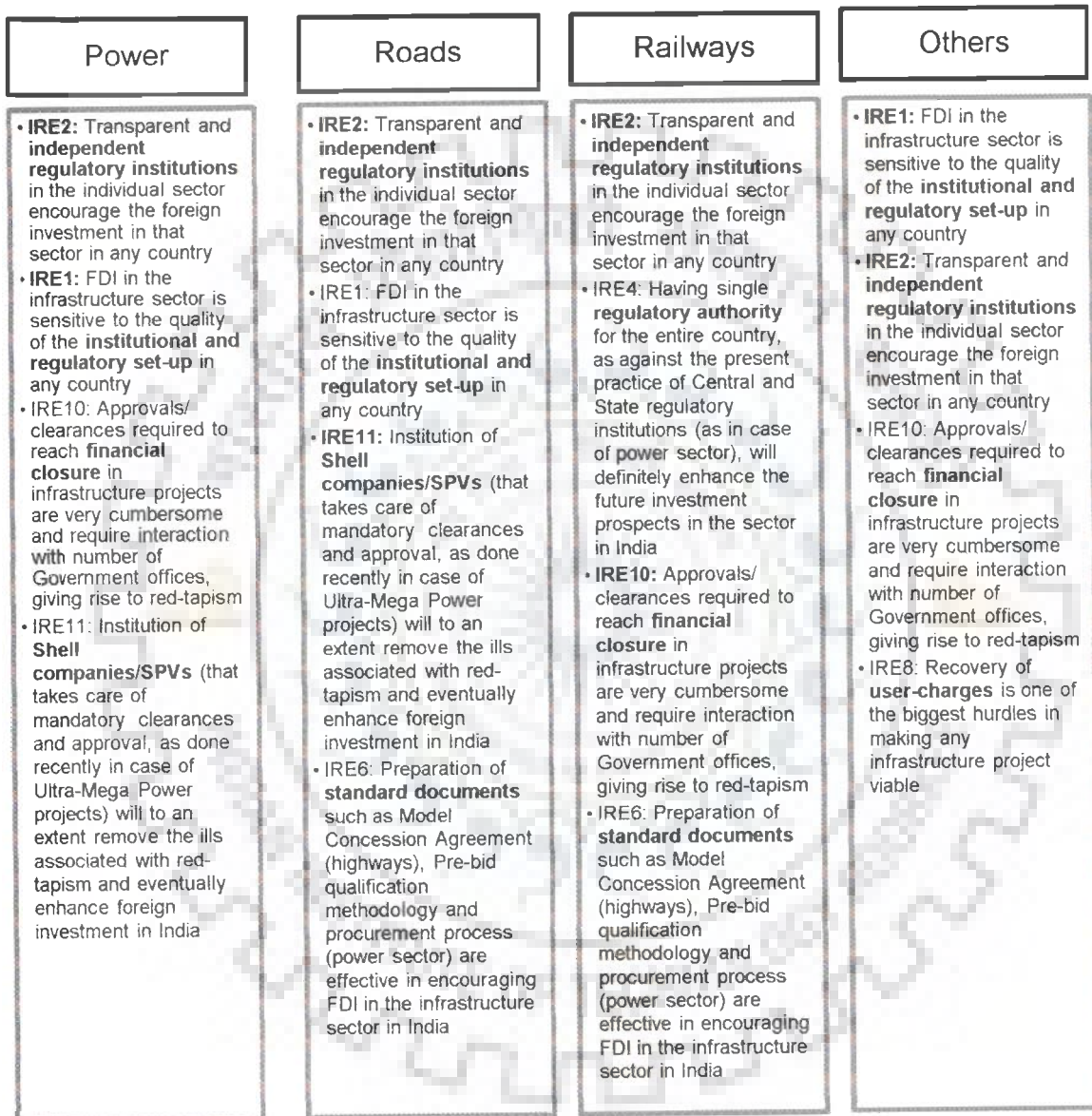
Table 4.9 (cont'd)

IRE16	Institutional framework, in infrastructure projects in India, is effective and avoids all possible conflict between stakeholders	Power	4 (21%)	12 (63%)	2.6	1.0
		Roads	07 (24%)	12 (41%)	2.7	1.0
		Railways	01 (13%)	04 (50%)	2.4	1.1
		Others	04 (14%)	17 (61%)	2.4	1.1
		Total	16 (19%)	45 (54%)	2.5	1.0
IRE17	In event of disputes-arising, the conflict-resolution mechanism is effective in India	Power	05 (26%)	11 (58%)	2.5	1.3
		Roads	05 (17%)	17 (59%)	2.4	0.9
		Railways	01 (13%)	05 (63%)	2.5	1.2
		Others	04 (14%)	19 (68%)	2.2	1.0
		Total	15 (18%)	52 (62%)	2.4	1.1
IRE18	The risk allocation mechanism, as provided in the <b>standard project documents</b> –MCA (model concession agreement in case of roads), PPA (power purchase agreement in case of power sector) is effective in India.	Power	07 (37%)	09 (47%)	2.8	1.2
		Roads	07 (24%)	13 (45%)	2.7	1.0
		Railways	03 (38%)	02 (25%)	3.3	1.0
		Others	08 (29%)	14 (50%)	2.8	1.1
		Total	25 (30%)	38 (45%)	2.8	1.1
IRE19	Association of the <b>multilateral agencies</b> in the infrastructure projects in developing countries in one way or the other facilitates FDI.	Power	16 (84%)	Nil	4.2	0.7
		Roads	23 (79%)	Nil	4.0	0.7
		Railways	05 (63%)	01 (13%)	3.7	1.0
		Others	20 (71%)	Nil	4.2	0.8
		Total	64 (76%)	01 (1%)	4.1	0.7
IRE20	Association of <b>multi-lateral agencies</b> in the infrastructure projects in India is quite prevalent, which facilitates the FDI in the sector	Power	08 (42%)	05 (26%E)	3.2	1.0
		Roads	15 (52%)	04 (14%)	3.4	0.8
		Railways	04 (50%)	01 (13%)	3.4	0.8
		Others	17 (61%)	01 (4%)	3.9B	0.9
		Total	44 (52%)	11 (13%)	3.5	0.9

**Figure 4.7: Pictorial view of the Institutional and Regulatory variables highly favoured by the total respondents**



**Figure 4.8: Pictorial view of the investment variables highly favored by the different categories of respondents**



#### 4.7 Risk related factors affecting FDI inflow in infrastructure in India

Substantial amount of literature studies have highlighted that infrastructure structure projects are associated with the variety of risks and degree of risk varies with the stage of development of economies. In case of developing and transition economies risk factor and its affect is likely to be on the other higher side. In order to measure the magnitude of the risk associated with the Indian economy respondents were asked questions on the risks which are specifically associated with the infrastructure projects. These risks as identified are one highlighted by the World Bank literature, namely – Commercial risk, Legal risk, Political risk, Development risk and Operation risk. The perception of different categories of respondents varies much for this variable. According to interpretation of responses majority of respondents found political risk to be the major deterrent towards attracting investment in the country for infrastructure projects. However, for the majority of power and roads sector respondents' commercial risks are the major cause of concern and for the railways respondents the degree of legal risk of country is key factor to investment decision. Table 4.10 provides the details of the top two risks having greater implications on investment decision. One major reason for this difference in viewpoint can be that in power and road sector significant amount of projects are there which are operating with private participation and have received FDI in some or other part of the project chain while in case of railways no such commercial operation is there with the involvement of private or foreign operator.

Respondents also highlighted that commercial and political risks are one which the investor would prefer to hedge before they make investment in infrastructure projects in India (Table 4.11). The likely reason for being wary about commercial risk is that in case of India historically it is observed that implementation of effective user-charges for infrastructure related services have been out of context due to vote bank politics of India and secondly the fear of sudden changes in policy or rolling back of policies is another crucial matter for investors.

**Table 4.10: Risks having greater implications**

Power	Roads	Railways	Others	Total
<b>Commercial risk (16; 84% D)</b>	Commercial risk (24; 83%)	Legal risk (05; 63%)	Political risk (21; 75%)	Commercial risk (63; 75%)
<b>Political risk (14; 74%)</b>	Political risk; Development risk (19; 66%)	Construction completion risk (06; 75%)	Commercial risk (20; 71%)	Political risk (57; 68%)

**Table 4.11: Risks likely to be hedged by foreign firms before making investments**

Power	Roads	Railways	Others	Total
Commercial risk (14; 74% D)	Commercial risk (20; 69%)	Political risk (04; 50%)	Commercial risk (18; 64%)	Commercial risk (56; 67%)
Political risk (10; 53%)	Development risk (14; 48%)	Commercial risk (04; 50%)	Political risk (13; 46%)	Political risk (37; 44%)

In case of political risk top two risks as identified by the substantial number of respondents are risks related to policy changes and sovereign risk (Table 4.12). The other risk identified as having a crucial effect is the cancellation of concession risk, especially in the case of roads and railways. Policy risk relates to changes in the infrastructure policy priority, Government yielding to pressures from the interest groups, who oppose private participation in infrastructure development, price setting policy. The degree of political risk of a country is a key factor in making the investment decision. A potential investor will not readily invest in a country having high risk associated with change of policies, as infrastructure projects involve heavy sunk cost and have long gestation period. Any sudden and unexpected change in the policy can be very deterrent to the project, and if any economy falls in the high risk zone investors become less keen to invest in that country.

Sovereign risk as identified from previous studies is risk arising from the host government's breach or repudiation of a contract, non performance or other actions or inactions by a sub national host Government and/or contractual counterparties. This was the case experienced in the Enron- Dabhol project the

company was forced to make exit as federal Government was reluctant in upholding the commitments made by the federal government in case of breach of contract by the State Government. However, there are many other controversies attached to the Enron- Dabhol debacle in India.

Cancellation of concession risk is one of the outcomes of the policy risk. However, this kind of risk has been more associated with the Chinese economy as it is a socialist economy and Government can withdraw the policy at its convenience. In case of India roads and railways sector respondents have expressed concern for this particular variable.

**Table 4.12: The most deterrent political risks for foreign investment in infrastructure projects in India**

Power	Roads	Railways	Others	Total
Sovereign risk (13; 68% D)	<b>Sovereign risk; Policy risk</b> (22; 76%)	Policy risk (07; 88%)	Policy risk (19; 68%)	Policy risk (60; 71%)
Policy risk (12; 63%)	Cancellation of concession risk (19; 66%)	Sovereign risk; Cancellation of concession risk (03; 38%)	Sovereign risk (18; 64%)	Sovereign risk (56; 67%)

**Table 4.13: The most deterrent commercial risks for foreign investment in infrastructure projects in India**

Power	Roads	Railways	Others	Total
Customer base and prospects forecasting risk (58; 69% D)	Customer base and prospects forecasting risk (20; 69%)	Customer base and prospects forecasting risk (04; 50%)	Customer base and prospects forecasting risk (19; 68%)	Customer base and prospects forecasting risk (58; 69%)
Foreign exchange – Devaluation risk (12; 63%)	Foreign exchange – Devaluation risk; Interest rate risk (15; 52%)	Foreign exchange – Devaluation risk (03; 38%)	Interest rate risk (18; 64%)	Interest rate risk (44; 52%)



In case of commercial risk- associated with inflation, foreign exchange, interest rate, currency inconvertibility, demand forecasting and technological risk, the respondents felt that customer base forecasting risk and interest rate risk are two most important commercial risks which matter significantly to the stakeholders (Table 4.13). Customer base prospects is one critical issue because based on it demand for the services is assessed, most of the respondents felt that in India assessment of the demand for the services is very poor and inaccurate. Interest rate risk is important, because any fluctuations in the lending rate will cost investors dearly. The other risk identified is foreign-exchange devaluation risk i.e the risk of losses due to unfavourable movements of the exchange rate (such as the impact of a local currency devaluation on projects earning revenues in local currency but paying expenses and debt service in foreign currency). This is of utmost importance for the foreign investors who invest in equity in foreign currency but earn profit in domestic currency and would like to repatriate the earnings to their home country.

The survey also aimed at capturing the outlook of the respondents on the issues related to the legal framework in the country (Table 4.14). Respondents identified that in India the most disappointing thing is that there are enough laws but getting laws enforced is a big concern. Secondly, it was highlighted that the dispute redressal mechanism in the country is not very effective and as such pose a great threat to the investors. Due to the ineffectiveness of the redressal mechanism there is a common fear that it leads to the escalation of the project cost.

Project development is one of the most crucial stages in the life cycle of the infrastructure projects as it involves many approvals and clearances from different government departments and agencies. Respondents were asked question to identify the development risk which is most critical for the infrastructure projects. Land acquisition and environmental risk appeared to be most significant concern to the respondents (Table 4.15). Land acquisition risk arises from the government's non committal attitude towards acquiring entire land for the project on behalf of the developer. Land acquisition becomes a problem when private players have to procure land on their own by negotiations with the locals. These kinds of deals are very expensive and eventually add to the cost of the project. Apart from this, often land owners decline to sell the land. Environmental risks are

one related to the approvals of the environmental clearances, this involves number of agencies and departments which leads to complexities. In an event of no-clearance, the project will experience unnecessary delays.

Respondents were further asked questions related to the operating risks in India. The types of risk associated with the operation of infrastructure projects in India are – demand related risk, cost-escalation risk, management risk and force-majeure risk. The survey result suggests that the cost-escalation and demand risk are the major operational risks which bother the investors. Both in the road and the power sector, if there is a huge gap in the expected demand and the realized demand, it will severely affect the return on equity and in worst case may also not be able to recover the project cost (Table 4.16). Escalation in the cost of input resources which may be structural material, equipment cost, logistics cost, supply material cost, fuel cost, human resource cost have a very unyielding impact on the overall project outcomes.

**Table 4.14: The most deterrent Legal risks for foreign investment in the infrastructure projects in India**

Power	Roads	Railways	Others	Total
Dispute redressal risk (12; 63%)	Law enforcement risk (23;79%)	Dispute redressal risk (05; 63%)	Law enforcement risk (17; 61%)	Law enforcement risk (54; 64%)
Law enforcement risk (10;53% D)	Dispute redressal risk (16; 55%)	Law enforcement risk (04; 50%)	Dispute redressal risk (16; 57%)	Dispute redressal risk (49; 58%)

Apart from these projects related risks, respondents were asked questions on the risk arising due to the volatile nature of the stock market prices of the resources used in building the infrastructure projects. However, respondents reply to this particular variable was not very positive, except the railway sector respondents who felt that the fluctuations in the global stock market influence the investment strategies of the international investors. The results to some extent conveyed their non-understanding about the subject (Table 4.17).

**Table 4.15: The most deterrent development risks for foreign investment in the infrastructure projects in India**

Power	Roads	Railways	Others	Total
Land acquisition risk (18; 95%)	Land acquisition risk (26; 90%)	Land acquisition risk (07; 88%)	Land acquisition risk (24;86%)	Land acquisition risk (75; 89%)
Environmental clearance risk (13; 68%)	Environmental clearance risk (21; 72%)	Rehabilitation risk (04; 50%)	Environmental clearance risk (17; 61%)	Environmental clearance risk (53; 63%)

**Table 4.16: The most deterrent Operating risks for foreign investment in infrastructure projects in India**

Power	Roads	Railways	Others	Total
Cost escalation risk (16; 84%)	Demand risk (23; 79%)	Cost escalation risk (04; 50%)	Demand risk (20; 71%)	Cost escalation risk (60; 71%)
Demand risk (12; 63%)	Cost escalation risk (20; 69%)	Force-majeure risk (03; 38%)	Cost escalation risk (20; 71%)	Demand risk (56; 67%)

#### 4.8 Financial Environment

Efficiency and degree of development of the domestic financial system in host country is an important indicator of the competitiveness of any economy. According to studies conducted by the World Economic Forum, financial market enablers play significant role in triggering infrastructure investment in any country. In most of the infrastructure projects, the debt to equity ratio is approximately 70:30 and these projects involve heavy sunk cost, and the gestation period is also very high. However, the rate of return in most of these projects is significant. In such a backdrop, a well developed financial market enables the project developers to find the investors who have deep understanding of the risks associated with the infrastructure projects.

As underlined in the above discussion sophisticated financial market is an indicator of the soundness and creditworthiness of a growing economy. Hence, based on the review of literature, researcher made an effort to probe the few important variables related to the financial market which are key to attract foreign

investment into the infrastructure projects in India. Majority of the respondents agreed that existence of strong domestic financial market is an important indicator of the trustworthiness and credibility of the host country. About 85% of the total respondents accepted that the degree of stability in the domestic financial market to great extent represents the amount of capital-risk associated with the economy. The view of the respondents in different sectors is almost similar and more than 80% of the respondents in the different categories hold the same perspective. The respondents (87%) also conveyed that host country's credit-worthiness index, as calculated by different International agencies, is an important reference data for the foreign investors to judge the financial health of the host economy.

**Table 4.17: Survey results on global price volatility and industry related risk**

Variable	Description	Sectors	Top 2 Box	Bottom 2 Box	Mean	Standard deviation
RE8	The perception of <b>industry-related risk</b> measured by the volatility of their stock market prices relative to world stock market prices influence international investment strategies in a particular industry.	Power	06 (32%)	06 (32%E)	3.1	1.2
		Roads	09 (31%)	05 (17%)	3.1	0.8
		Railways	05 (63%)	Nil	4.0	0.9
		Others	16 (57%)	01 (4%)	3.8	0.8
		Total	36 (43%)	12 (14%)	3.4	1.0
RE9	The industries pertaining to the infrastructure sector in India, are also prone to this kind of risk	Power	06 (32%)	05 (26%)	3.0	1.1
		Roads	07 (24%)	04 (14%)	3.1	0.8
		Railways	04 (50%)	01 (13%)	3.8	1.2
		Others	10 (36%)	03 (11%)	3.4	0.8
		Total	27 (32%)	13 (5%)	3.2	0.9
RE10	Risk associated with <b>global price volatility</b> (petroleum products and other) influence the investment decision especially in the electricity sector in India	Power	11 (58%)	04 (21%)	3.4	1.1
		Roads	09 (31%)	03 (10%)	3.3	0.9
		Railways	03 (38%)	01 (13%)	3.5	1.1
		Others	16 (57%)	02 (7%)	3.6	0.8
		Total	39 (46%)	10 (12%)	3.4	0.9

Table 4.18: Respondents perception regarding the financial market enablers

Variable	Description	Sectors	Top 2 Box	Top 2 Bottom	Mean	Standard deviation
FE1	Existence of strong <b>domestic financial (capital) market</b> is important in minimizing risks associated with currency volatility, in case of foreign capital and also to have access to long-term local currency finance in case of infrastructure projects	Power	17 (89%)	01 (5%)	4.4	0.8
		Roads	24 (83%)	Nil	4.4	0.7
		Railways	07 (88%)	01 (13%)	4.3	1.0
		Others	23 (82%)	01 (4%)	4.2	0.9
		Total	71 (85%)	03 (4%)	4.3	0.8
FE2	Country's <b>credit rating index</b> as measured by certain agencies, affects the FDI decision pertaining to infrastructure sector in that country.	Power	19 (100%)	Nil	4.4	0.5
		Roads	26 (90%)	Nil	4.3	0.7
		Railways	06 (75%)	Nil	4.3	0.9
		Others	22 (79%)	Nil	4.3	0.8
		Total	73 (87%)	Nil	4.3	0.7
FE3	There is an easy <b>access to local capital market</b> in India and this is an important facilitator of FDI in infrastructure sector in the country	Power	07 (37%)	08 (42%)	3.0	1.2
		Roads	11 (38%)	05 (17%)	3.2	0.9
		Railways	05 (63%)	02 (25%)	3.5	1.1
		Others	12 (43%)	06 (21%)	3.3	1.1
		Total	35 (42%)	21 (25%)	3.2	1.0
FE4	Quality of <b>financial regulatory system</b> is good in India and acts as a pull factor for FDI.	Power	08 (42%)	05 (26%)	3.3	1.1
		Roads	04 (14%)	10 (34%)	2.8	0.8
		Railways	05 (63%)	03 (38%)	3.4	1.5
		Others	18 (64%)	4 (14%)	3.6	0.8
		Total	35 (42%)	22 (26%)	3.2	1.0

Table 4.18 (cont'd)

FE 5	The <b>local-bond market</b> in India is quite developed to facilitate long term financing in local currency.	Power	02 (11%)	12 (63%,D)	2.1	1.1
		Roads	04 (14%)	17 (59%,D)	2.3	1.1
		Railways	03 (38%)	01 (13%)	3.4	1.0
		Others	03 (11%)	16 (57%D)	2.3	0.9
		<b>Total</b>	<b>12 (14%)</b>	<b>46 (55%)</b>	<b>2.3</b>	<b>1.0</b>
FE 6	The <b>swap-market</b> in India is quite developed, to facilitate long term financing in local currency, at cheaper rates.	Power	02 (11%)	13 (68%)	1.7	1.1
		Roads	03 (10%)	21 (72%D)	1.8	1.1
		Railways	04 (50%)	2 (25%)	3.1	1.1
		Others	nil	19 (68%)	2.0	0.8
		<b>Total</b>	<b>09 (11%)</b>	<b>55 (65%)</b>	<b>2.0</b>	<b>1.1</b>
FE 7	<b>Time and cost</b> required for raising the funds in India is quite high as compared to other economies.	Power	15 (79%)	02 (11%)	3.8	1.0
		Roads	18 (62%)	03 (10%)	3.7	0.9
		Railways	05 (63%)	01 (13%)	3.9	1.1
		Others	19 (68%)	2 (7%)	3.9	0.9
		<b>Total</b>	<b>57 (68%)</b>	<b>8 (10%)</b>	<b>3.8</b>	<b>1.1</b>
FE 8	Allowing the entry of <b>financial investors</b> as equity stakeholders in infrastructure projects, will introduce a longer-term financing element and enhance the FDI prospects.	Power	14 (74%)	1 (5%)	3.9	0.8
		Roads	23 (79%)	3 (13%)	4.0	0.9
		Railways	06 (75%)	1 (13%)	4.0	1.1
		Others	23 (82%)	1 (4%)	4.1	0.8
		<b>Total</b>	<b>66 (79%)</b>	<b>6 (7%)</b>	<b>4.0</b>	<b>0.8</b>
FE 9	Allowing special concessions on <b>external commercial borrowings</b> (in case of infrastructure projects) will have a positive impact on FDI in the infrastructure projects in India	Power	10 (53%)	01 (5%)	3.7	0.9
		Roads	21 (72%)	01 (3%)	3.8	0.7
		Railways	06 (75%)	1 (13%)	3.9	1.4
		Others	17 (61%)	2 (7%)	3.7	0.9
		<b>Total</b>	<b>54 (64%)</b>	<b>5 (6%)</b>	<b>3.8</b>	<b>0.9</b>

Table 4.18 (cont'd)

FE 10A	Existence of a well developed risk-mitigating instruments/insurance market for infrastructure projects enhances the investment prospects in this sector in any country.	Power	19 (100%)	Nil	4.5	0.5
		Roads	28 (97%)	Nil	4.5	0.5
		Railways	07 (88%)	01 (13%)	4.3	1.0
		Others	26 (93%)	Nil	4.4	0.6
		Total	80 (95%)	1 (1%)	4.4	0.6
FE10B	In India such kind of insurance market is well developed	Power	nil	14 (74% D)	1.8	0.8
		Roads	nil	21 (72%)	1.8	0.8
		Railways	03 (38%)	2 (25%)	3.1	1.2
		Others	nil	18 (64%)	2.1	0.8
		Total	03 (04%)	55 (65%)	2.0	0.9

The other important findings of the survey responses on the financial market enablers in India are as follows

- Majority of respondents in the different categories are of the view that the local bond market in India is not well developed so as to enable the easy raising of corporate debt in this sector (FE5). Local bond market is seen as the most lucrative source of financing long-term projects in local currency to avoid the risk associated with the foreign debt market.
- Swap market in India is not at all developed. The importance of swap market for the foreign investors is that it enables them to exchange the debts raised in their domestic and host country to lower the interest liabilities (FE6).
- The other common point of agreement among the respondents is that the time and cost required to raise the funds in India is very high. Processing time and cost for funds, loans and debt is one of the crucial factors to attract the foreign investment, as significant delays in it may lead to escalation in the project cost (FE7).
- Majority of the respondents also agreed that to increase the credibility of the projects there should be a provision to encourage the participation of the financial institutions as equity holders so that the risk associated with the bad debt is covered (FE8).

- Further, there was a general response that if Government provides incentives related to the external commercial borrowings, specifically for infrastructure projects, it will enhance the foreign investor's participation (FE9).
- Respondents also hold a strong view that the foreign investors also shy from investing in these projects as there are not enough risk mitigating instruments available in the Indian financial market. It is discussed earlier that infrastructure projects involve variety of risks as such presence of good risk-mitigating mechanisms may further increase the worth of a promising market. Host country's preparedness to bear and accommodate the financial risk is very important consideration for the investors (FE10).

Regarding the access to local capital market and the quality of financial regulatory system in the country respondents had different views. Majority respondents from the railways and others categories had a positive opinion regarding the quality of Indian Financial Regulatory System, while regarding ease of access to local market only respondents from railways were hopeful.

#### **4.8 CONCLUSION**

The findings of this conceptual quantitative analysis are very significant in terms of highlighting the sectoral shortcomings as well as strengths which either undermines or enhances, at few instances, the investment in the sector. Nevertheless, respondents displayed guarded optimism, and also it could be advocated from the responses that accelerated investment is contingent upon improvements in the number of key areas and processes that can bring about transparency in the whole investment procedure. The assessments of the responses highlight the issues that need to be borne in mind and deliberated upon to enhance the sectoral growth. Broadly speaking, respondents from all the categories more or less shared the similar concerns and priorities about the infrastructure investment environment. Beside the general uniformity of the responses certain notable sector specific concerns have emerged. In the following section a brief summary of the sector specific preferences are discussed.

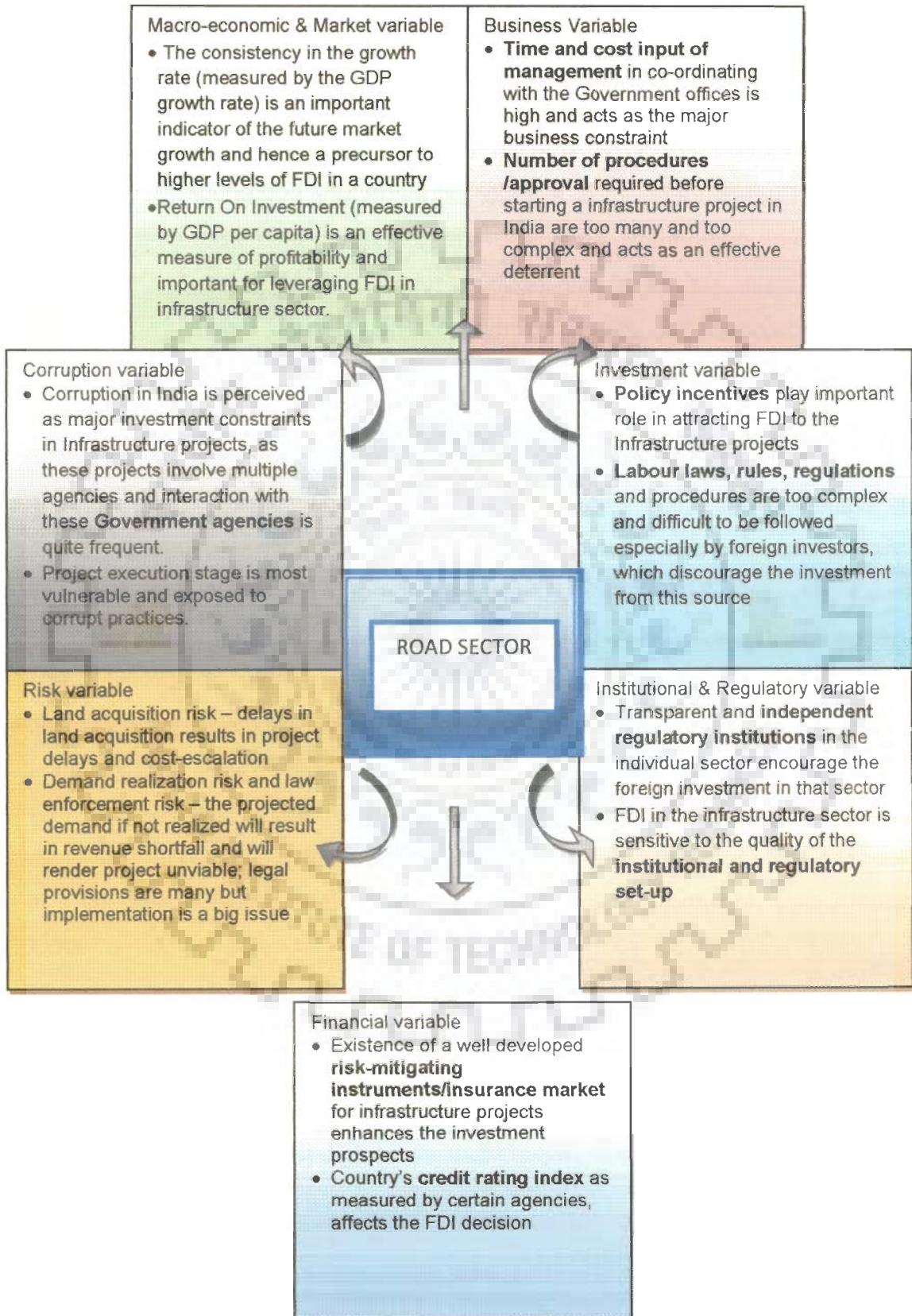


## Roads

Private participation in the road sector in India has picked up after 2000, when the GoI started developing the majority of its highway projects on a BOT (toll/annuity) basis. These projects are characterized by their expansive size, long time-lines (long recovery period), heavy dependence on demand realization and user charge recovery. The respondents in this sector have expressed their sensitivity to the risks arising due to the aforesaid characteristics. To facilitate effective use of the private sector participation, the Government has put in place Standard Documents which cover the risk associated with the development of any highway project. Respondents have expressed their enthusiasm about the standardization of the contract documents, but still despite the framing of MCA the response of the global community to the projects is not very encouraging<sup>1</sup>. Land acquisition, and time and cost input required for getting the project clearances have been highlighted to be very cumbersome in the case of India as multiple agencies are involved in it. Respondents have shown great inclination towards institution of Shell Companies for the major projects, which will be responsible for taking all the required approvals for the project execution before financial closure.

Major key issues under different variables as highlighted by the road sector respondents are further exhibited in Figure 4.9

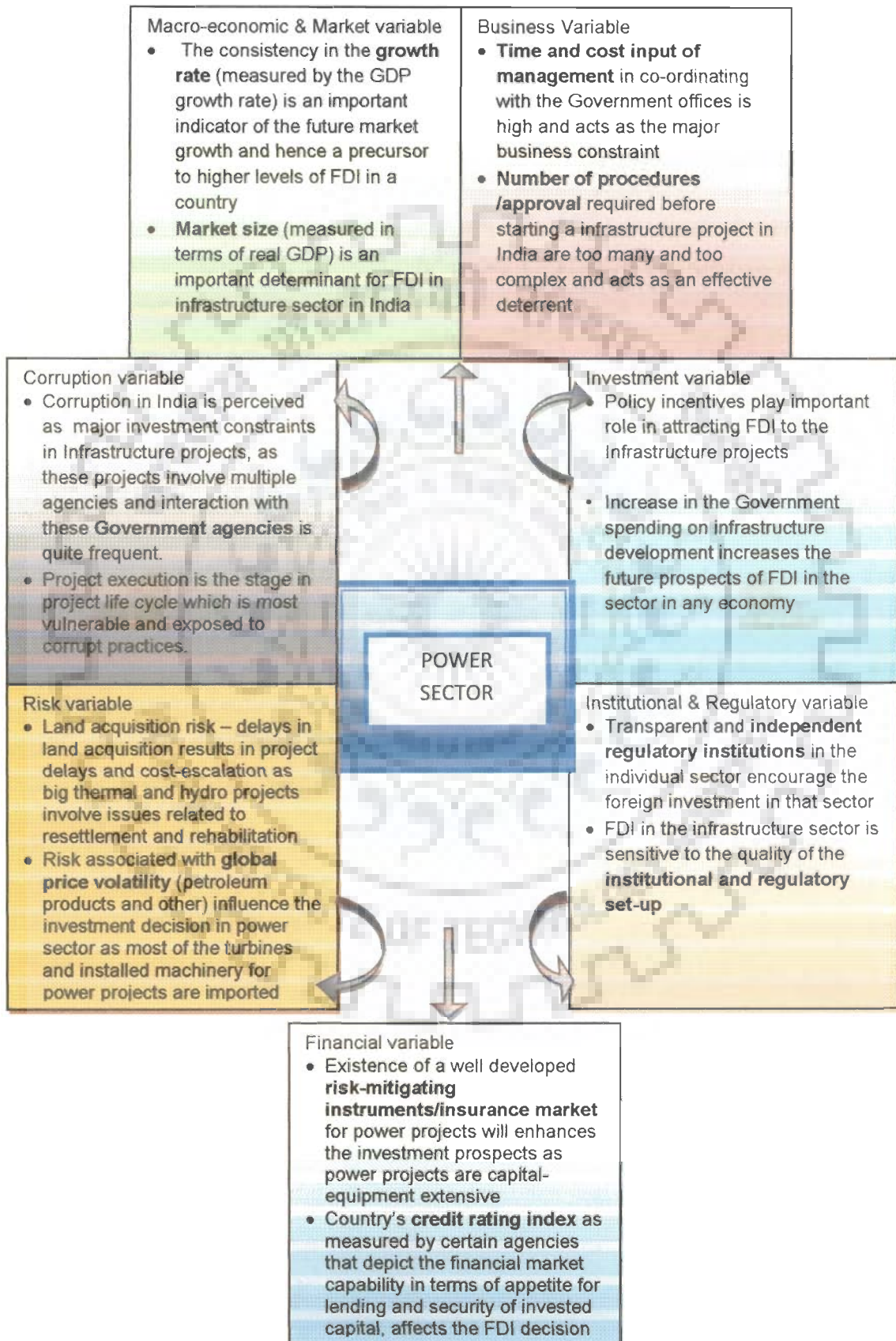
**Figure 4.9: Road sector major specific variables as highlighted by the primary analysis**



## Power

Respondents from the power sector shared many similarities with the respondents from the roads sector. However, certain variations were noticed probably due to sector characteristics. On a positive note, respondents have displayed their confidence in the ongoing reform process in the sector. Nonetheless, certain concerns specific to the sector are highlighted by the respondents. Fuel-connectivity is a major infrastructure bottleneck faced by the power generation companies. As most of the generation plants are coal based or gas based. Timely access to the input resource is a major issue. One of the respondents from a major power providing company –NCC Ltd. highlighted that arrangement for procuring fuel resource is typically between the power company and the concerned fuel provider. The project provider or sponsor, which is mainly the Central or State Government, is basically free from the risk associated with the timely availability of the fuel. Electricity is not a commodity, which can be stored in the case of expected fuel shortage in future and released when demand is there. There are clauses in the Power Purchase Agreement (PPA) which force penalties on the generating company in case the electricity is not supplied as per the contract. Apart from this, the power projects involve number of approvals and clearances which is highlighted by the respondents as very time-consuming and tedious. In case of foreign investors the ease of filling approvals and procuring clearance is very important measure to achieve the “Value of investment” as unnecessary delays is expected to run in escalating the project cost. This is an important policy challenge for India, if it has to lure foreign investment, as it is getting tough competition from China where the investor has to bother about nothing but consolidating his part of funding. The major issues as highlighted by the responses are summarized in figure 4.10.

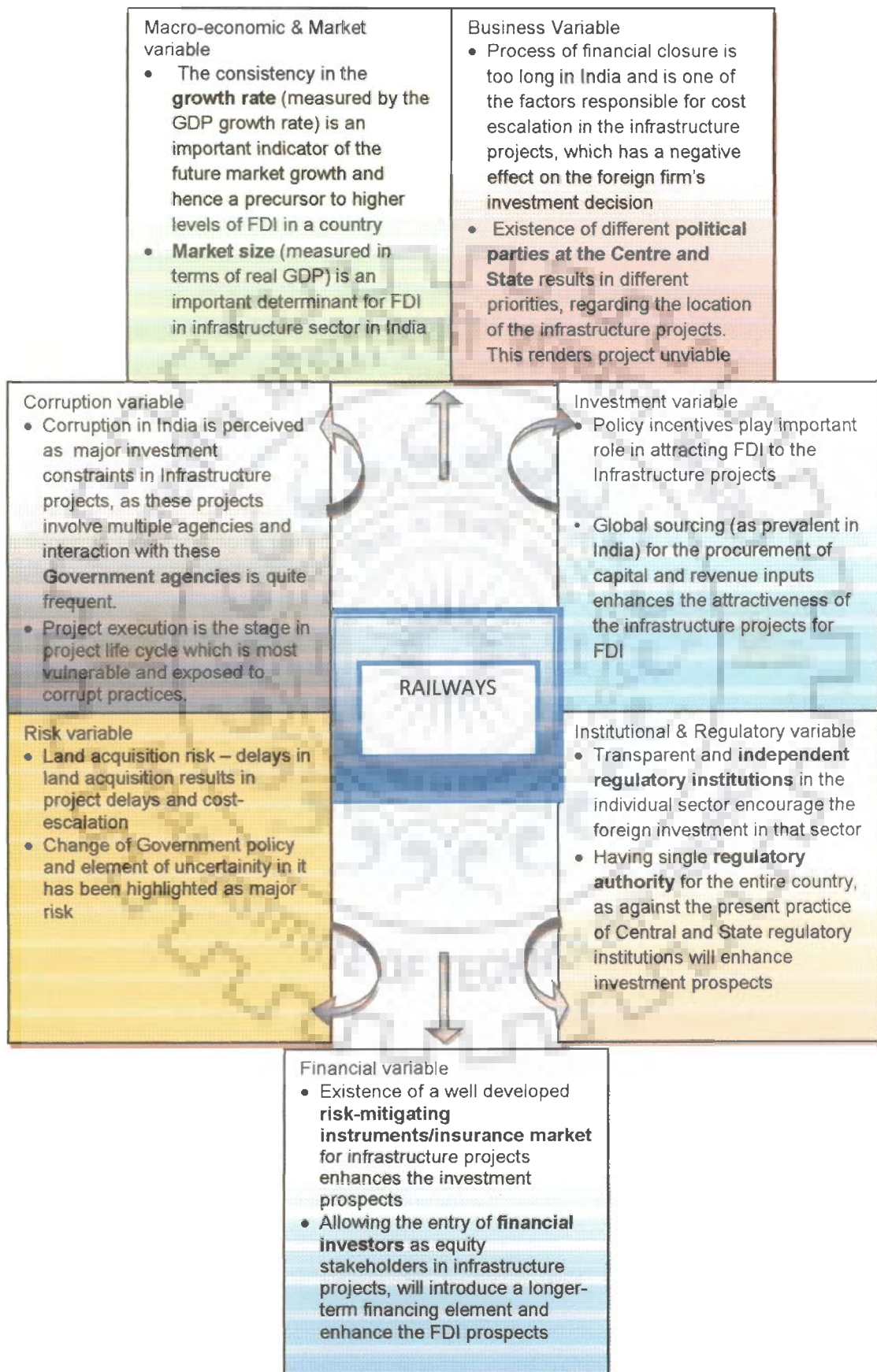
**Figure 4.10: Power sector specific variables as highlighted by the primary analysis**



## **RAILWAYS**

It was a difficult task to interpret the responses of railway sector respondents in the absence of any significant private participation in the sector<sup>2</sup>. However, researcher based her interpretation on the wisdom and understanding of the railways sector as gathered from various newspaper articles and Gol's publications like India Infrastructure Report 2009. Responses of the railway sector executives had little variance from the response of other two sectors, probably the executives shared their experience in the projects implemented by the Government as partner in SPVs. The major findings are summarized in the Figure 4.11. Railway respondents hold different perception regarding the type of risk most crucial for the sector, the respondents highlighted the risk in change of the Government policies for example rolling back of certain policy tend to have great implication over the project life. Government has initiated policy to involve private sector in development of world-class railways and in developing dedicated freight corridor. In both these activities land acquisition is one important and crucial element. However, respondents have advocated that land acquisition is the major hurdle in the railway sector projects. Till now, entire railways infrastructure in the country is maintained and run by the single entity – Ministry of Railways. If Government is serious in actively inducting private funding in railway development, then the most important policy reform needed will be the land reforms. As land is a concurrent subject and both Central and State have powers to make provisions related to land reform. Building railway network is a very elaborate process and railway corridors cover number of States. As such ineffectiveness of provisions in one State may be cause of contention for the entire project irrespective of the fact that the Central or other State Government displayed great fervor for the project.

**Figure 4.11: Railway sector specific variables as highlighted by the primary analysis**



The findings of this chapter are based on the qualitative assessment of the survey responses and some of the findings especially sector specific are advocated relying on one to one discussions which the researcher had with the sectoral experts and the executives working in the individual sectors. The major research findings based on the empirical assessment of the survey responses using advanced statistical technique is conducted in the following chapter.

### Endnotes

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<sup>1</sup> In 2008 NHAI was able to receive bids only for 22 of the 60 projects up for international competitive bidding and of which only 7 projects have been awarded. Even for 22 projects majority of the firms which qualified were domestic firms and have tied with the international firms to fulfill technical eligibility criteria (information as shared with the researcher by NHAI).

<sup>2</sup> As of now in private participation Ministry of Railways is following the provision of Railways Act 1989, according to which the most suitable railway project for private sector participation will be Government railway project i.e project in which Gol owns major part of the project. Hence, at present there are no complete private sector projects in the country. The only exceptions are two port connectivity project -Mundra Port and Dhamra Port, implemented as purely private projects (for more details please refer to India Infrastructure Report 2009). Most of the projects in rail-port connectivity are implemented through SPVs



**CHAPTER 5**



## 5.1 APPROACH

It is described in chapter 4 that a questionnaire was developed to empirically identify the determinants which can broadly be suggested as policy variables to fetch more foreign investment into the infrastructure sector in India (as defined in the scope, infrastructure for this study will comprise of roads, power and railways). While the questionnaire was developed with the help of valuable inputs from experts and information fetched from review of literature, responses were taken from experienced professionals in three sectors working in foreign multinationals operating in India and from professionals working in the private infrastructure firms which have some experience with the foreign multinational firms or have received FDI from the foreign firms in their infrastructure activities. Apart from this, efforts were made to capture the perspective of the think tanks, bureaucrats and academicians working in this area. As already described, questionnaire was focused to identify the extent of relationship (if any) between the variables as described under 7 broad heads namely - macro-economic environment, business environment, corruption environment, investment environment, institutional and regulatory environment, risk environment and financial environment.

This is one of the studies of its kind which focuses on identifying the factors which can be made effective in attracting more FDI in the infrastructure sector specifically roads, power and railways<sup>1</sup>. As an expected outcome of the study, survey results have provided new insights which may be looked by the federal and State Governments as priority measures to attract foreign investors as equity partners in the infrastructure projects in country. The most significant achievement of this whole exercise is the building of the sector-centric factors apart from identifying the overall important determinants for the infrastructure industry. In Chapter 4 a descriptive analysis of the individual sections based on Mean, Standard Deviation and Top Two Box and Top Two Bottom approach, is already done to capture the cross-sectorial and cross-disciplinary view of the respondents. With this analysis, researcher was able to separately capture the perspective of the respondents from different categories regarding the prevailing strength and weaknesses in the Indian economic, business and policy environment concerning

infrastructure development. In Chapter 4 researcher has also provided the description of the variables selected for questionnaire.

As described in chapter 1 that the experience, maturity and understanding of the subject were the key criteria for identification of the respondents. Researcher has sent the questionnaire to almost 357<sup>2</sup> people through emails, personal visits and also developed a HTML page on internet to have online-submission of the questionnaire response, it is attached as Annexure. Out of 357, researcher received 84 responses the structure of these 84 respondents is as follows

- Power sector respondents : 19 numbers
- Road sector respondents : 29 numbers
- Railway sector respondents : 08 numbers
- Others (bureaucrats, legal experts, consultants and academicians) : 28

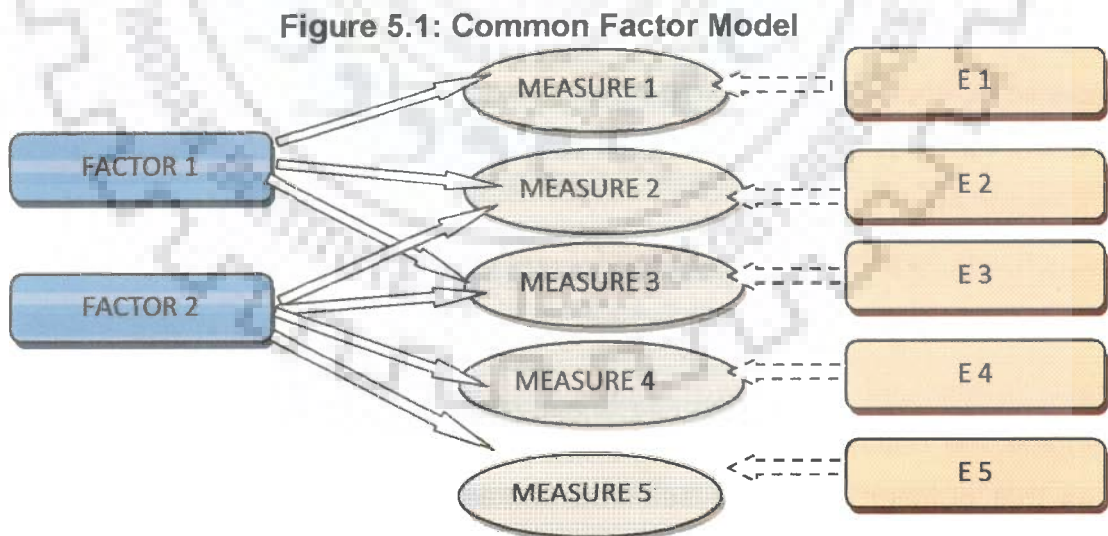
The survey questionnaire consisted of two major sections. Section A was focused to know about the impact of broad variables as defined in the Chapter 4 on the investment decision of the foreign firms. The analysis of this part is already described in detail in chapter 4 as this section was not based on likert scale therefore no typical statistical technique was applied, only top 2 boxes, bottom 2 boxes, mean and standard deviation was applied to arrive at the results. Section B of the questionnaire was based on likert scale (5-1, 5 equivalent to strongly agree and 1 equivalent to strongly disagree) where researcher asked questions ranging from 10-20 in each of the 7 parts of the section, to have a comprehensive feedback on the environment as prevalent in each of the questioned variable.

The approach for analysis of the responses is discussed in detail in the Chapter 1, as suggested statistical technique of factor analysis is employed to analyze the primary data. Due to small sample size researcher preferred to do the factor analysis in two stages. In stage1, factor analysis was run on individual sections of the Part B and factors were identified for the individual section. These factors identified from individual sections were then combined and factor analysis was run on the combined factors and final factors were identified. In the following section, a brief review of the factor analysis is done as a background study to interpret the results.

## 5.2 METHODOLOGY (FACTOR ANALYSIS)

### 5.2.1 Introduction

The main applications of factor analytic techniques are: (1) to reduce the number of variables and (2) to detect structure in the relationships between variables, that is to classify variables. Factor analysis is a process which examines how underlying constructs influence the responses on a number of measured variables. Factor analysis assumes that the manifest (observed) variables are linear combinations of some underlying latent (unobservable) factors. It is used in exploratory research to reduce the larger number of variables-set to smaller number of factors. It is based on an assumption that there exist certain latent factors which contribute to the maximum variance among the observed variables and these underlying hidden factors are much smaller in number than the number of observed variables. To elaborate it further, according to *DeCostre* (1998) [32] “factor analysis model proposes that each observed response (measure 1 through measure 5) is influenced partially by underlying common factors (factor 1 and factor 2) and partially by underlying unique factors (E1 through E5), refer figure 5.1. The strength of the link between each factor and each measure varies, such that a given factor influences some measures more than others”.



Source: DeCostre, 1998

“Factor analysis does not tell the meaning of the factors. It is purely a statistical technique indicating, which and to what degree variables relate to an underlying and undefined variable. The substantive meaning given to a factor is typically based on the researcher’s careful examination of what the high loading

variable measures" [75]. Further, it is advocated that "Factors must be called something other than the name of a particular observed variable. The reason for this is that Factors are latent aggregates of observed variables and the factor name should represent the aggregate and not be confused with a specific measured variable. The rotation process indicates the simplest solution among a potentially infinite number of solutions that are equally compatible with the observed correlations" [75].

### 5.2.2 Factor Analysis Process

Factor analysis is performed by observing the co-relation between the measured (observed variables). Variables which highly correlate to each other are (either positively or negatively) assumed to be influenced by the same factors and those that are uncorrelated are likely to be influenced by different factors [32]. The following section focuses on how to conduct factor analysis.

The background study on factor analysis suggested the following steps in extracting the factors or to reduce the variables. The correlation matrix for the variables is constructed to find the nature and extent of correlation between each variable. Inspection of the correlation matrix may show that there are positive relationships within some sets of variables and there may be negative within some, also the intensity of relationship is higher between some subsets as compared to others. The next step involves extraction of the initial factor, there are number of methods available to extract variables, from these Principal Component (PC) Factor Analysis is usually employed. Before conducting factor extraction or reduction, it is required to carryout  $KMO^3$  and Bartlett's test of sphericity.

Once these tests are within acceptable limits, PC factor analysis is done to extract smaller set of underlying factors. There are number of methods to determine the optimal number of factors or components. The *Kaiser criterion*<sup>4</sup> states that number of factors selected should be equal to the number of the Eigenvalues<sup>5</sup> of the correlation matrix that are greater than one. The Scree test<sup>6</sup> states that one should plot the eigenvalues of the correlation matrix in descending order, and then use a number of factors equal to the number of eigenvalues that occur prior to the last major drop in eigenvalue magnitude or when graph tends to level off. The factors thus obtained are rotated to obtain a factor solution that is equal to that obtained in the initial extraction but which has the simplest

interpretation<sup>7</sup>. The factor loading<sup>8</sup> on the variables is observed and factors are finally extracted, these factors identified are tested for reliability test of being the right combination for this Cronbach's alpha<sup>9</sup> test is conducted. The factors are then interpreted to provide the best explanation for the variables influenced by that factor. Based on above discussions, researcher adopted the following methodology to identify and interpret the factors in the questionnaire study.

- SPSS software was used to conduct factor analysis. Cut-off value of 0.00001 for determinant of correlation was taken as acceptable to carry KMO and Bartlett's test of Sphericity, necessary to carry before PC factor analysis. KMO value greater than 0.5 and Bartlett's value less than 0.05 is taken as acceptable.
- Eigen value = or >1 is taken as cut off for extracting the number of factors and is validated by the Scree plot. Rotated Component Matrix was drawn using Varimax method to minimize the number of variables that have high loadings on each factor.
- Factor Loading of 0.3 or more is taken as significant cut-off value.
- Variables having a factor loading of 0.7 or more were selected<sup>10</sup>.
- Latent variables which had a factor loading of 0.5 or above on one factor and 0.3 or more on another factor were also selected.

The above methodology has been used as a guiding principle and not as cut-off approach to overcome practical difficulties in the factor-analysis. As discussed in section 5.1 that due to small sample size, the researcher preferred to do the factor analysis in two stages. In stage 1 factor analysis was run on the individual sections of the Part B and factors were identified for the individual sections. These factors identified from the individual sections were then combined and factor analysis was run on the combined factors and final factors were identified.

### **5.3 FACTOR ANALYSIS OF PART B OF THE QUESTIONNAIRE**

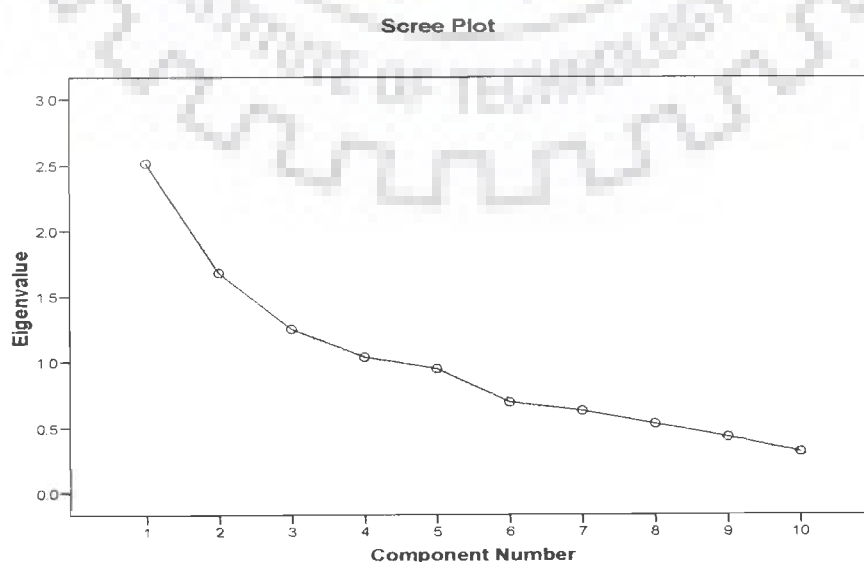
#### **5.3.1 Section MME: Macroeconomic and Market Environment – Variables MME1 to MME10**

Factor analysis of the 10 variables was carried out using SPSS software to capture the effect of various macroeconomic and market factors on the flow of FDI

in the infrastructure projects in India. The main factors considered are- Inflation, exchange rate, GDP, GDP growth rate, public debt, ROI, purchasing power parity etc.

The mean of almost all the variables in this section was greater than 3 except the variable 3 and respondent rate was also high there were 3 responses missed for variable MME5 and 1 each for variable MME1, MME6 and MME10. None of the variables were dropped as no multi-collinearity observed among the variables, coefficient of correlation for none of the two variables was more than 0.5. The Correlation Matrix of the 10 variables showed determinant as 0.154 which is greater than 0.00001 and acceptable to carryout *KMO* and *Bartlett's Test of Sphericity*, as a pre-requisite before performing factor analysis. In Bartlett's test the significance value was 0.000 which is below 0.05 and acceptable. *KMO* value was 0.615 which was greater than 0.5 and hence acceptable to conduct Principal Component Factor Analysis. The number of factors was determined by using the cut-off eigenvalue = or > 1 and also cross-validated by Scree plot as depicted in Figure 5.2. Rotated Component Matrix was drawn using Varimax method, which minimizes the number of variables that have high loadings on each factor. A factor loading of 0.3 or more was used as significant cut-off value. The matrix has 4 components as shown in Table 5.1.

**Figure 5.2: Scree Plot for Factor Analysis of Variables MME1 to MME10**



**Table 5.1: Rotated Component Matrix with 4 Components for Factor Analysis of Variables MME1 to MME10**

	Component			
	1	2	3	4
MME7	.809			
MME1	.646			
MME6	.592	.519		
MME4		.817		
MME8		.707		
MME5			.778	
MME2			.738	
MME10	.459		.526	
MME3				.826
MME9				.681

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 8 iterations.

Based on the results of the Rotated Component Matrix and further on the analysis of Component Transformation Matrix variable MME6, MME4 and MME8 is the combination that best represents the section. The variables for the component (named as F1) identified for final analysis are shown in Table 5.2 with factor loadings in descending order. Variable MME6 which is an independent variable is chosen although its factor loading is less than the cut-off value of 0.7 because of the reason that minimum of three variables are needed to interpret a factor and this factor appears to be of great importance.

The variables of this group focus on the profit maximization measures observed in an economy. Market size if more will result in more demand of the service and eventually adds to the revenue generation. If rate of return is high in an economy it will result in more cash surplus for the firm and similarly if currency rate are stable in economy it will not result in fluctuation of repatriated profit from the host economy to home economy. To corroborate the above result Cronbach's alpha ( $\alpha$ ) value was calculated through reliability analysis for these variables, which was 0.677 that is more than 0.6 and proves that the combination is good and acceptable.

Table 5.2: Variables identified for the Factor - F1

Factor 1		
MME4	<b>High variability rate</b> in the value of <b>host country's currency</b> discourages FDI in the infrastructure projects, due to foreign exchange risk	0.817
MME8	<b>Return On Investment</b> (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector	0.707
MME6	<b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India	0.519

### 5.3.2: Section BE: Business Environment – Variables BE1 to BE9

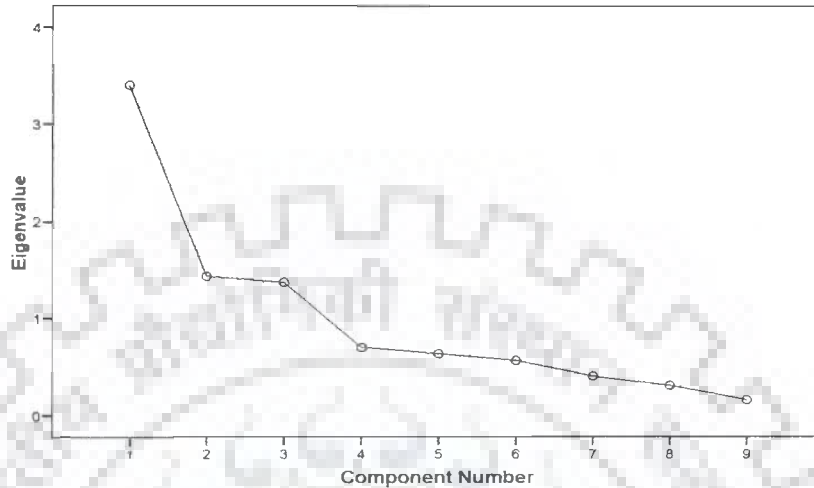
Factor analysis of the 09 variables in the business environment was carried out. The purpose of this section was to assess India's business enabling environment for FDI firms in the infrastructure sector. It aims at examining the quality and capacity of Government agencies in interacting with the foreign firms in case of infrastructure projects. The main factors considered are- Inflation, exchange rate, GDP, GDP growth rate, public debt, ROI, purchasing power parity etc.

The mean of all the variables in this section was greater than 3 it ranges from 3.63 to 4.58 and respondent rate was also 100 percent for all the variables except for 3 variables - BE1, BE5 and BE8 where one response each was missing for the variables. None of the variables were dropped as no multi-collinearity observed among the variables. The Correlation Matrix of the 09 variables showed determinant as 0.034 which is greater than 0.00001 and acceptable to carryout *KMO* and *Bartlett's Test of Sphericity*. In Bartlett's test the significance value was 0.000 which is below 0.05 and acceptable. *KMO* value was 0.736 which was greater than 0.5 and hence acceptable. The number of factors was determined by using the cut-off eigenvalue = or > 1 and also cross-validated by Scree plot as depicted in Figure 5.3. As suggested by the eigen value analysis where three variables had value greater than 1. While conducting SPSS it was specified that three components will be considered and rest dropped. Rotated Component



Matrix was drawn as defined earlier. The matrix has 3 components as shown in Table 5.3

**Figure 5.3: Scree Plot for Factor Analysis of Variables BE1 to BE9**



**Table 5.3: Rotated Component Matrix with 3 Components for Factor Analysis of Variables BE1-BE9**

	Component		
	1	2	3
BE4	.884		
BE5	.849		
BE6	.817		
BE1		.831	
BE2		.785	
BE3		.714	
BE7			.739
BE9			-.730
BE8			.709

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 5 iterations

Based on the results of the Rotated Component Matrix variable BE4, BE5 and BE6 is the combination that best represents the section. The variables for the component (Factor 2) identified for final analysis are shown in Table 5.4 with factor loadings in descending order.

Table 5.4: Variables identified for the Factor – F2

Factor - F2		
BE4	Most of the infrastructure projects fall within the preview of more than one <b>State Government</b> with an involvement of <b>Central Government agencies</b> in some or the other form	.884
BE5	This involvement as stated in question no. 4 leads to the multiple and conflicting roles of different <b>Government agencies</b> and eventually has an adverse impact on investment decision of the foreign firm	.849
BE6	The major implementation problems are encountered at the <b>state level</b> , as project implementation takes place at the State level. This particular aspect undermines the FDI promotion efforts of the Government.	.817

The aspects highlighted by these variables suggest that the clarity in roles of the federal and provincial Government is an important indicator of the effective working environment for firms operating in large sectors. To corroborate the above result Cronbach's alpha ( $\alpha$ ) value was calculated through reliability analysis for these variables, which was 0.858 that is more than 0.6 and proves that the combination is good and acceptable.

### 5.3.3: Section CE: Corruption – Variables CE1 to CE9

In this section 5 questions were asked from the respondent's out of this 3 were based on likert scale and 2 were multiple choice questions. Due to shortage of questions in this section all the three likert scale question will be considered for final analysis. The analysis of the multiple choice part was already dealt in detail in chapter 4.

### 5.3.4: Section IE: Investment Environment – IE1 to IE13

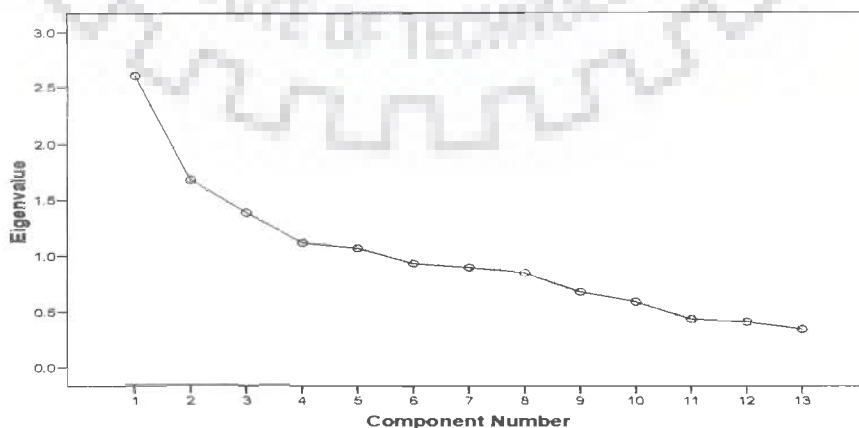
The purpose of this section is to assess the overall effectiveness of the investment environment as existing in India, in creating impact on the FDI investment decisions in the infrastructure sector. Various factors as examined are investment promotion institutions, labour policies, taxes, existing infrastructure facilities, incentives etc. This section has overall 15 questions but last two questions were a multiple choice questions therefore they could not be made the

part of factor analysis. The analysis of these two questions as carried in chapter 4 will be considered as final analysis for them.

The mean of all the variables in this section was greater than 3 it ranges from 3.06 to 4.70 and respondent rate was also 100 percent for all the variables except for 4 variables. Variables IE5, and IE6 had 1 missing response and variables IE7 and IE8 had two missing response each. None of the variables were dropped as no multi-collinearity observed among the variables. The Correlation Matrix of the 09 variables showed determinant as 0.127 which is greater than 0.00001 and acceptable to carryout *KMO* and *Bartlett's Test of Sphericity*. In Bartlett's test the significance value was 0.000 which is below 0.05 and acceptable. *KMO* value was 0.571 which was greater than 0.5 and hence acceptable. The number of factors was determined by using the cut-off eigenvalue = or > 1 and also cross-validated by Scree plot as depicted in Figure 5.4. As suggested by the eigen value analysis where five variables had value greater than 1. Based on these results Rotated Component Matrix was drawn as defined earlier. The matrix has 5 components as shown in Table 5.5.

Based on the results of the Rotated Component Matrix variable IE4, IE5, IE6, IE13 is the combination that best represents the section. The variables for the component (Factor F4) identified for final analysis are shown in Table 5.6 with factor loadings in descending order.

**Figure 5.4: Scree Plot for Factor Analysis of Variables IE1 to IE13**



**Table 5.5: Rotated Component Matrix with 3 Components for Factor Analysis of Variables IE1-IE13**

	Component				
	1	2	3	4	5
IE13	.748				
IE4	.736				
IE6	.429		.407	.406	
IE12		.882			
IE11		.649			
IE3			.850		
IE10			.558		
IE2				.662	
IE5	.410			.558	
IE1				.545	
IE9				-.407	
IE7					.866
IE8		.515			.627

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 8 iterations.

**Table 5.6: Variables identified for the Factor – F4**

Factor - F4		
IE13	Identifying and nurturing long-term relationship with competent and trustworthy <b>domestic partner</b> is quite difficult in case of joint ventures in India	.748
IE4	<b>Labour laws, rules, regulations</b> and procedures are too complex and difficult to be followed especially by foreign investors, which discourage the investment from this source.	.736
IE6	The ease of <b>conversion or transfer of currency</b> in India is a favourable feature towards attracting FDI in infrastructure sector as revenues generated are in local currency.	.429
IE5	The existence of <b>double-taxation avoidance treaty</b> between host and home country plays important role in attracting FDI in infrastructure sector in India (India has DTAA, Double Taxation Avoidance Agreement with 69 countries).	0.410

The host country factors as highlighted by these variables suggest that the policies related to foreign currency investment in country and reliability and stability extent of domestic firms operating in the sector is considered as effective measures of investor's choice of destination. To corroborate the above result Cronbach's alpha ( $\alpha$ ) value was calculated through reliability analysis for these variables, which was 0.662 which is more than to 0.5 and is acceptable.

### 5.3.5: Section IRE: Institutional and Regulatory Environment – IRE1 to IRE20

In this section the quality of the existing institutional, regulatory and legal framework in the Indian infrastructure sector is assessed. The main aim is to identify the existing bottlenecks in the system which are discouraging FDI in the sector in the country. The factor analysis of all the 20 variables was done. The mean of all the variables in this section was greater than 3, except IRE3, IRE9, IRE16, IRE17 and IRE18, it ranges from 2.38 to 4.80 and respondent rate was 100 percent for 11 variables. Variables IRE5, IRE7, IRE9, IRE10, IRE15 and IRE18 had 1 missing response, variables IRE4 and IRE20 had two missing response each and variable IRE19 had 3 missing response. None of the variables were dropped as no multi-collinearity observed among the variables. The Correlation Matrix of the 09 variables showed determinant as 0.002 which is greater than 0.00001 and acceptable to carryout *KMO* and *Bartlett's Test of Sphericity*. In Bartlett's test the significance value was 0.000 which is below 0.05 and acceptable. *KMO* value was 0.645 which was greater than 0.5 and hence acceptable. The number of factors was determined by using the cut-off eigenvalue = or > 1 and also cross-validated by Scree plot as depicted in Figure 5.5. As suggested by the eigen value analysis where six variables had value greater than 1. Based on these results Rotated Component Matrix was drawn. The matrix has 6 components as shown in Table 5.7. Based on the results of the Rotated Component Matrix variable IRE3, IRE9, IRE12, IRE16, IRE17, IRE18 is the combination that best represents the group.

Figure 5.5: Scree Plot for Factor Analysis of Variables IRE1 to IRE20.

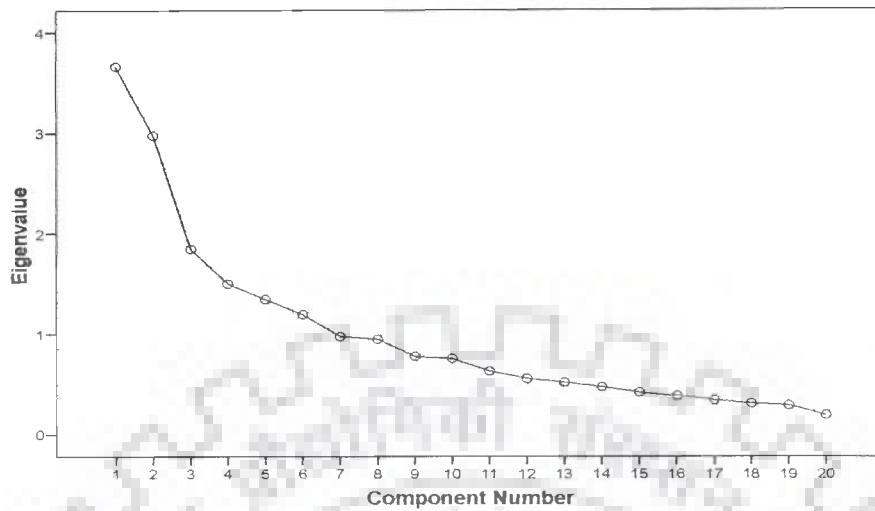


Table 5.7: Rotated Component Matrix with 3 Components for Factor Analysis of Variables IRE1-IRE20

	Component					
	1	2	3	4	5	6
IRE9	.782					
IRE3	.696					
IRE16	.643					
IRE17	.577					
IRE18	.521					
IRE12	.513					
IRE1		.742				
IRE11		.739				
IRE2		.679				
IRE10		.481				
IRE20			.818			
IRE6			.731			
IRE8			.536		-.406	
IRE19		.411	.503			
IRE7				.720		
IRE15				-.711		
IRE5					.806	
IRE4					.671	
IRE13						.683
IRE14				-.435		.682

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 13 iterations.

The combination was further validated by its Cronbach's alpha value which was 0.740, i.e, higher than 0.5, this is the best fit for reliability analysis and proves that the combination is good. The variables for the component (factor F5) identified are shown in Table 5.8 with factor loadings in descending order. However, it is realized that the many variables in this combination have mean less than 3 except IRE12. On interpreting this analysis it was found that maximum of the respondents disagreed to the statements.

**Table 5.8: Variables identified for the Factor – F5**

Factor F5		
IRE9	Institutional framework in India provides effective security mechanism for the recovery of user-charges in infrastructure projects	.782
IRE3	The regulatory regime (in power sector) in India is very stable and regulatory authorities /institutions work in an autonomous manner (without any political control and influence)	.696
IRE16	Institutional framework, in infrastructure projects in India, is effective and avoids all possible conflict between stakeholders	.643
IRE17	In event of disputes-arising, the conflict-resolution mechanism is effective in India	.577
IRE18	The risk allocation mechanism, as provided in the standard project documents –MCA (model concession agreement in case of roads), PPA (power purchase agreement in case of power sector) is effective in India.	.521
IRE12	Effective rule of Law (reliable and stable legal institutions), is an important factor in India, responsible for attracting FDI in the infrastructure sector	.513

### 5.3.6: Section RE: Risk-related variables – RE1 to RE10

The questions asked by the respondents in this section were focused to identify the major risks associated with the infrastructure projects in India, which deters FDI in the sector. There were 10 questions and variable 1 to 7 were multiple choice, analysis of these variables is already done in the chapter 4. Question no. 8, 9 and 10 were based on likert scale and since there are just three

likert scale questions in this section all these three variables RE8, RE9 and RE10 will be included in the final factor analysis as it is not feasible to conduct factor analysis for these three variables alone. Also the reliability of these variables as a group was tested by finding the Cronbach alpha value which was found to be 0.840, which proves that the combination is good.

### 5.3.7: Section FE: Financial Market Environment variables – FE1 to FE10b

The purpose of this section is to capture the capacity of domestic capital market in attracting FDI in the infrastructure sector in India. The section captured the respondents' perception on the financial market enablers through 11 variables. The mean of most of the variables in this section was greater than 3, except FE5, FE6 and FE10b, it ranges from 1.99 to 4.43. Respondent rate was 100 percent for variables FE2, FE3 and FE4, 3 responses were missing for variable FE6, 2 each for variables FE1, FE5, FE8 and FE9 and 1 response each was missing for variables FE7, FE10a and FE10b. None of the variables were dropped as no multi-collinearity observed among the variables. The Correlation Matrix of the 11 variables showed determinant as 0.052 which is greater than 0.00001 and acceptable to carryout *KMO* and *Bartlett's Test of Sphericity*. In Bartlett's test the significance value was 0.000 which is below 0.05 and acceptable. *KMO* value was 0.689 which was greater than 0.5 and hence acceptable. The number of factors was determined by using the cut-off eigenvalue = or > 1 and also cross-validated by Scree plot as depicted in Figure 5.6. As suggested by the eigen value analysis where four variables had value greater than 1. Based on these results Rotated Component Matrix was drawn. The matrix has 4 components as shown in Table 5.9.



Figure 5.6: Scree Plot for Factor Analysis of Variables IRE1 to IRE20

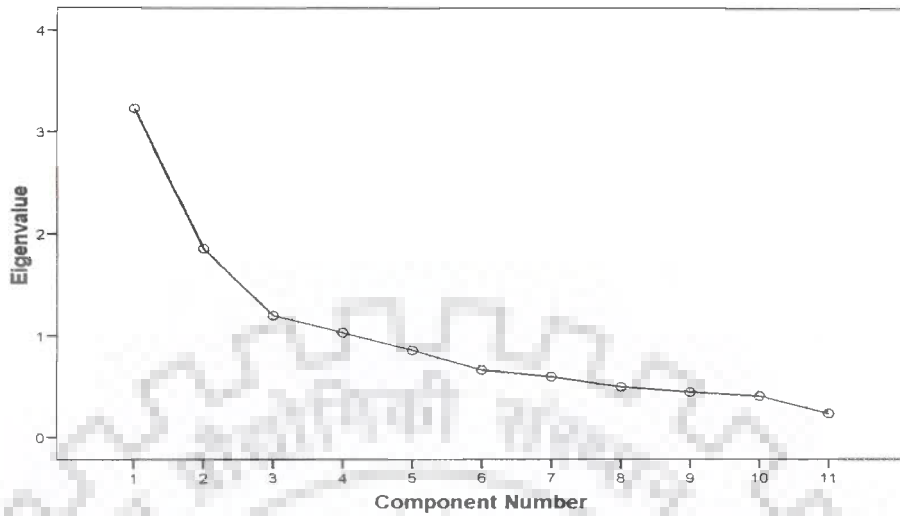


Table 5.9: Rotated Component Matrix with 3 Components for Factor Analysis of Variables FE1-FE10

	Component			
	1	2	3	4
FE6	.863			
FE5	.840			
FE10b	.742			
FE3		.712		
FE7		-.704		
FE4		.669		
FE8			.811	
FE9			.690	
FE2			.592	
FE10a				.844
FE1				.684

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 Rotation converged in 6 iterations.

Based on the results of the Rotated Component Matrix variable FE5, FE6, FE10b is the combination that best represents the group. The combination was further validated by its Cronbach's alpha value which was 0.807 i.e higher than 0.5, this is the best fit for reliability analysis and proves that the combination is

good. The variables for the component (factor F7) identified are shown in Table 5.10 with factor loadings in descending order.

**Table 5.10: Variables identified for the Factor – F7**

Factor - F7		
FE6	The <b>swap-market</b> in India is quite developed, to facilitate long term financing in local currency, at cheaper rates.	.863
FE5	The <b>local–bond market</b> in India is quite developed to facilitate long term financing in local currency	.840
FE10b	In India such kind of insurance market is well developed (reference is to part 10a: Existence of a well developed risk-mitigating instruments/insurance market for infrastructure projects enhances the investment prospects in this sector in any country).	.742

### 5.3.8 Summary of Factor Analysis Results of Individual Sections

Analysis of the individual sections of the questionnaire has resulted in the following seven “Study Factors” to be included for the combined factor analysis.

- **F1:** Economic returns and market potential defines the country’s attractiveness for investment
- **F2:** Attitude and motivation of Government authorities and role-clarity amidst the federal and provincial Government
- **F3:** Level of corruption
- **F4:** Securing competent domestic partner
- **F5:** Effective institutional framework and consistency of regulatory and judicial practices
- **F6:** Risk environment
- **F7:** Increased accessibility to domestic capital market and availability of risk mitigating instruments.

Finally, 25 variables are identified under the seven groups of the study. These variables are;

**Section MME: MME4, MME8, MME6**

**Section BE: BE4, BE5, BE6**

**Section CE: CE1, CE2, CE3**

Section IE: IE4, IE5, IE6, IE13

Section IRE: IRE3, IRE9, IRE12, IRE16, IRE17, IRE18

Section RE: RE8, RE9, RE10

Section FE: FE5, FE6, FE10b

To corroborate the results, Cronbach's alpha ( $\alpha$ ) value was calculated through reliability analysis for these variables, which was 0.79 and is greater than 0.5, hence found acceptable too.

**Table 5.11: Interpretation of the Factors identified in the Factor Analysis of the individual sections study**

S.No.	Description	Factor Loading
F1: Economic returns and market potential defines the country's attractiveness for investment		
MME4	<b>High variability rate in the value of host country's currency</b> discourages FDI in the infrastructure projects, due to foreign exchange risk	0.817
MME8	<b>Return On Investment</b> (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector	0.707
MME6	<b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India	0.519
F2: Attitude and motivation of Government authorities and role-clarity amidst the federal and provincial Government		
BE4	Most of the infrastructure projects fall within the preview of more than one <b>State Government</b> with an involvement of <b>Central Government agencies</b> in some or the other form	.884
BE5	This involvement as stated in question no. 4 leads to the multiple and conflicting roles of different <b>Government agencies</b> and eventually has an adverse impact on investment decision of the foreign firm	.849

Table 5.11 (contd.)

BE6	The major implementation problems are encountered at the state level, as project implementation takes place at the State level. This particular aspect undermines the FDI promotion efforts of the Government.	.817
F3: Level of corruption		
CE1	Corruption in India is perceived as one of the major investment constraints in Infrastructure projects, as these projects involve multiple agencies and interaction with these <b>Government agencies</b> is quite frequent	
CE2	There is a clear divide in <b>North versus South</b> perception of “work-friendly” environment.	
CE3	South Indian States have <b>clean working conditions</b> as compared to, many of the otherwise “resourceful and facilities starving”, North Indian States. This is one strong reason for more foreign investment pouring in infrastructure projects in southern region of the country	
F4: Securing competent domestic partner		
IE13	Identifying and nurturing long-term relationship with competent and trustworthy <b>domestic partner</b> is quite difficult in case of joint ventures in India	.748
IE4	<b>Labour laws, rules, regulations</b> and procedures are too complex and difficult to be followed especially by foreign investors, which discourage the investment from this source.	.736
IE6	The ease of <b>conversion or transfer of currency</b> in India is a favourable feature towards attracting FDI in infrastructure sector as revenues generated are in local currency.	.429
IE5	The existence of <b>double-taxation avoidance treaty</b> between host and home country plays important role in attracting FDI in infrastructure sector in India (India has DTAA, Double Taxation Avoidance Agreement with 69 countries).	0.410
F5: Effective institutional framework and consistency of regulatory and judicial practices		
IRE9	Institutional framework in India provides effective security mechanism for the recovery of <b>user-charges</b> in infrastructure projects	.782

Table 5.11 (contd.)

IRE3	The regulatory regime (in power sector) in India is very stable and regulatory authorities /institutions work in an autonomous manner (without any political control and influence)	.696
IRE16	Institutional framework, in infrastructure projects in India, is effective and avoids all possible <b>conflict</b> between stakeholders	.643
IRE17	In event of disputes-arising, <b>the conflict-resolution mechanism</b> is effective in India	.577
IRE18	The risk allocation mechanism, as provided in the <b>standard project documents</b> –MCA (model concession agreement in case of roads), PPA (power purchase agreement in case of power sector) is effective in India.	.521
IRE12	Effective <b>rule of Law</b> (reliable and stable legal institutions), is an important factor in India, responsible for attracting FDI in the infrastructure sector	.513
F6: Risk environment		
RE8	The perception of <b>industry-related risk</b> measured by the volatility of their stock market prices relative to world stock market prices influence international investment strategies in a particular industry.	
RE9	The industries pertaining to the infrastructure sector in India, are also prone to this kind of risk.	
RE10	Risk associated with <b>global price volatility</b> (petroleum products and other) influence the investment decision especially in the electricity sector in India	
F7: Increased accessibility to domestic capital market and availability of risk mitigating instruments.		
FE6	The <b>swap-market</b> in India is quite developed, to facilitate long term financing in local currency, at cheaper rates.	.863
FE5	The <b>local-bond market</b> in India is quite developed to facilitate long term financing in local currency	.840
FE10b	In India such kind of insurance market is well developed (reference is to part 10a: Existence of a well developed risk-mitigating instruments/insurance market for infrastructure projects enhances the investment prospects in this sector in any country).	.742

## 5.4 COMBINED FACTOR ANALYSIS

### 5.4.1 Integrated Quantitative Data Analysis and Interpretation

The analysis of the individual sections has resulted in new factors. These new variables are arrived at after summarizing the qualitative essence of the best variable combinations obtained from the factor analysis process. Five new criteria emerged from factor analysis – F1, F2, F4, F5, F7 while F3 and F6 are the same as examined in the survey<sup>11</sup>. A careful assessment of the variable combination – MME4, MME8 and MME6, identified from the factor analysis of the section MME highlights that **economic returns and market potential defines the country's attractiveness for investment**. Hence, Factor 1 is "**Economic returns and market potential**". Similarly, on careful examination of variable combinations obtained in section BE, IE, IRE and FE we arrive at Factors 2, 4, 5 and 7 respectively. Factor 3 and 6 are the same as in the sections CE and RE of initial study. Thus, the factors of the individual section as given below unambiguously represent their individual sections.

- *Economic returns and market potential* – interpretation of variables MME4, MME6 and MME8
- *Attitude and motivation of Government authorities and role-clarity amidst the federal and provincial Government* - interpretation of variables BE4, BE5, BE6
- *Level of corruption* – interpretation of variables CE1, CE2 and CE3
- *Securing competent domestic partner* - interpretation of variables IE4, IE5, IE6 and IE13
- *Effective institutional framework and consistency of regulatory and judicial practices* - interpretation of variables IRE3, IRE9, IRE12, IRE16, IRE17, and IRE18
- *Risk environment* - interpretation of variables RE8, RE9 and RE10
- *Increased accessibility to domestic capital market and availability of risk mitigating instruments* - interpretation of variables FE5, FE6, and FE10b

### 5.4.3 Combined factor analysis of the individual section's Factors

At this stage, factors of the individual 7 sections, consisting of 3, 3, 3, 4, 6, 3 and 3 variables each, are combined together. These 25 variables included in the final stage factor analysis are shown in Table 5.12.

**Table 5.12: Interpretation of the Factors identified for Combined Factor Analysis**

Variable	Description
MME4	<b>High variability rate</b> in the value of <b>host country's currency</b> discourages FDI in the infrastructure projects, due to foreign exchange risk
MME8	<b>Return On Investment</b> (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector
MME6	<b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India
BE4	Most of the infrastructure projects fall within the preview of more than one <b>State Government</b> with an involvement of <b>Central Government agencies</b> in some or the other form
BE5	This involvement as stated in question no. 4 leads to the multiple and conflicting roles of different <b>Government agencies</b> and eventually has an adverse impact on investment decision of the foreign firm
BE6	The major implementation problems are encountered at the <b>state level</b> , as project implementation takes place at the State level. This particular aspect undermines the FDI promotion efforts of the Government.
CE1	Corruption in India is perceived as one of the major investment constraints in Infrastructure projects, as these projects involve multiple agencies and interaction with these <b>Government agencies</b> is quite frequent
CE2	There is a clear divide in <b>North versus South</b> perception of "work-friendly" environment.
CE3	South Indian States have <b>clean working conditions</b> as compared to, many of the otherwise "resourceful and facilities starving", North Indian States. This is one strong reason for more foreign investment pouring in infrastructure projects in southern region of the country
IE13	Identifying and nurturing long-term relationship with competent and trustworthy <b>domestic partner</b> is quite difficult in case of joint ventures in India
IE4	<b>Labour laws, rules, regulations</b> and procedures are too complex and difficult to be followed especially by foreign investors, which discourage the investment from this source.
IE6	The ease of <b>conversion or transfer of currency</b> in India is a favourable feature towards attracting FDI in infrastructure sector as revenues generated are in local currency.
IE5	The existence of <b>double-taxation avoidance treaty</b> between host and home country plays important role in attracting FDI in infrastructure sector in India (India has DTAA, Double Taxation Avoidance Agreement with 69 countries).

Table 5.12 (contd.)

IRE9	<b>Institutional framework</b> in India provides effective security mechanism for the recovery of user-charges in infrastructure projects
IRE3	The <b>regulatory regime</b> (in power sector) in India is very stable and regulatory authorities /institutions work in an autonomous manner (without any political control and influence)
IRE16	Institutional framework, in infrastructure projects in India, is effective and avoids all possible <b>conflict</b> between stakeholders
IRE17	In event of disputes-arising, <b>the conflict-resolution mechanism</b> is effective in India
IRE18	The risk allocation mechanism, as provided in the <b>standard project documents</b> –MCA (model concession agreement in case of roads), PPA (power purchase agreement in case of power sector) is effective in India.
IRE12	Effective <b>rule of Law</b> (reliable and stable legal institutions), is an important factor in India, responsible for attracting FDI in the infrastructure sector
RE8	The perception of <b>industry-related risk</b> measured by the volatility of their stock market prices relative to world stock market prices influence international investment strategies in a particular industry.
RE9	The industries pertaining to the infrastructure sector in India, are also prone to this kind of risk.
RE10	Risk associated with <b>global price volatility</b> (petroleum products and other) influence the investment decision especially in the electricity sector in India
FE6	The <b>swap-market</b> in India is quite developed, to facilitate long term financing in local currency, at cheaper rates.
FE5	The <b>local-bond market</b> in India is quite developed to facilitate long term financing in local currency
FE10b	In India such kind of insurance market is well developed (reference is to part 10a: Existence of a well developed risk-mitigating instruments/insurance market for infrastructure projects enhances the investment prospects in this sector in any country).

The correlation matrix was prepared for factor analysis and it was observed that determinant was very low indicating multi-collinearity between the variables. Thus, 8 variables namely **CE1, IE4, IE13, IRE3, IRE12, IRE18, RE8** and **FE10b** were dropped and exercise was repeated for remaining 17 variables as shown in Table 5.13



**Table 5.13: Interpretation of the Factors identified on removing Multi-Collinearity**

S.No.	Description
MME4	<b>High variability rate</b> in the value of <b>host country's currency</b> discourages FDI in the infrastructure projects, due to foreign exchange risk
MME8	<b>Return On Investment</b> (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector
MME6	<b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India
BE4	Most of the infrastructure projects fall within the preview of more than one <b>State Government</b> with an involvement of <b>Central Government agencies</b> in some or the other form
BE5	This involvement as stated in question no. 4 leads to the multiple and conflicting roles of different <b>Government agencies</b> and eventually has an adverse impact on investment decision of the foreign firm
BE6	The major implementation problems are encountered at the <b>state level</b> , as project implementation takes place at the State level. This particular aspect undermines the FDI promotion efforts of the Government.
CE2	There is a clear divide in <b>North versus South</b> perception of "work-friendly" environment.
CE3	South Indian States have <b>clean working conditions</b> as compared to, many of the otherwise "resourceful and facilities starving", North Indian States. This is one strong reason for more foreign investment pouring in infrastructure projects in southern region of the country
IE13	Identifying and nurturing long-term relationship with competent and trustworthy <b>domestic partner</b> is quite difficult in case of joint ventures in India
IE6	The ease of <b>conversion or transfer of currency</b> in India is a favourable feature towards attracting FDI in infrastructure sector as revenues generated are in local currency.
IE5	The existence of <b>double-taxation avoidance treaty</b> between host and home country plays important role in attracting FDI in infrastructure sector in India (India has DTAA, Double Taxation Avoidance Agreement with 69 countries).
IRE9	Institutional framework in India provides effective security mechanism for the recovery of <b>user-charges</b> in infrastructure projects
IRE16	Institutional framework, in infrastructure projects in India, is effective and avoids all possible <b>conflict</b> between stakeholders

Table 5.13 (contd.)

IRE17	In event of disputes-arising, the <b>conflict-resolution mechanism</b> is effective in India
RE9	The industries pertaining to the infrastructure sector in India, are also prone to this kind of risk.
RE10	Risk associated with <b>global price volatility</b> (petroleum products and other) influence the investment decision especially in the electricity sector in India
FE6	The <b>swap-market</b> in India is quite developed, to facilitate long term financing in local currency, at cheaper rates.
FE5	The <b>local-bond market</b> in India is quite developed to facilitate long term financing in local currency

The correlation matrix for these 17 variables is shown in Table 5.14. The correlation matrix showed determinant as 0.001, which is more than 0.00001 and therefore acceptable. KMO value was 0.577, which is greater than 0.5 and acceptable. In Bartlett's test significance value was 0.00 which is below 0.05 and hence acceptable. The number of factors was determined by using the cut-off eigen value = or > 1 and also cross-validated by Scree plot as shown in Table 5.15. Rotated Component Matrix was drawn using Varimax method. A factor loading of 0.3 was used as significant cut-off value. The matrix is shown in Table 5.15

Table 5.14: Correlation Matrix for 17 Variables of final Factor Analysis

		MM E4	MM E6	M ME 8	BE 4	BE 5	BE 6	CE 2	CE 3	IE5	IE6	IRE 9	IRE1 6	IRE 17	RE 9	RE 10	FE 5	FE 6	
Correlation	MME4	1.000	.348	.448	.073	.013	.205	.004	.047	.169	.180	.280	-	-	.147	.170	.018	.057	
	MME6	.348	1.000	.482	.099	.109	.179	.293	.282	.058	.142	.120	.081	-	.283	.091	.001	.191	
	MME8	.448	.482	1.000	.007	.113	.023	.242	.254	.011	.233	.025	.133	.011	-	.200	.155	.014	.154
	BE4	.073	.099	.007	1.000	.829	.603	.098	.146	.077	.195	.115	-	-	.156	.004	.185	.142	
	BE5	.013	.109	.113	.829	1.000	.570	.229	.212	.065	.072	.047	.04	-	.189	.005	.159	.066	
	BE6	.205	.179	.023	.603	.570	1.000	.144	.264	.187	.338	.198	.19	.306	.377	.013	.018	.354	.270
	CE2	.004	.293	.242	.098	.229	.144	1.000	.752	.158	.065	.03	.03	-	.131	.083	.195	.008	
	CE3	.047	.282	.254	.146	.212	.264	.752	1.000	.012	.057	.05	.09	.112	.076	.103	.058	.199	.111
	IE5	.169	.058	.011	.077	.065	.187	.158	.002	1.000	.418	.153	.15	.064	.025	.046	.096	.088	.111
	IE6	.180	.142	.233	.195	.072	.338	.065	.017	.418	1.000	.128	.12	.115	.012	.049	.040	.074	.000
	IRE9	.280	.120	.025	.156	.047	.195	.033	.059	.153	.122	1.000	.346	.338	.022	.037	.067	.075	
	IRE16	.147	.081	.013	.185	.109	.306	.111	.11	.06	.11	.34	1.000	.556	.090	.078	.243	.143	
	IRE17	.147	.081	.013	.185	.109	.306	.111	.11	.06	.11	.34	.556	1.000	.034	.013	.327	.287	
	RE9	.147	.081	.013	.185	.109	.306	.111	.11	.06	.11	.34	.556	.090	1.000	.034	.013	.327	.287
	RE10	.170	.091	.155	.004	.005	.018	.083	.058	.096	.04	.03	.078	.013	.034	1.000	.030	.031	.006
	FE5	.018	.001	.014	.185	.159	.354	.199	.19	.08	.07	.06	.243	.324	.168	.031	1.000	.711	
	FE6	.057	.191	.154	.142	.066	.270	.008	.111	.11	.00	.07	.143	.287	.266	.006	.711	1.000	

Table 5.14 (cont'd)

Sig. (1-tailed)	MME 4																
		.001	.000	.255	.453	.031	.484	.335	.063	.052	.005	.025	.139	.091	.063	.436	.307
	MME 6	.001	.000	.186	.165	.053	.004	.005	.303	.101	.142	.232	.285	.005	.210	.497	.044
	MME 8	.000	.000	.476	.156	.418	.013	.010	.459	.017	.410	.113	.462	.034	.082	.449	.085
	BE4	.255	.186	.476	.000	.000	.187	.093	.244	.039	.150	.004	.010	.079	.484	.048	.103
	BE5	.453	.165	.156	.000	.000	.019	.027	.282	.260	.337	.028	.031	.044	.481	.079	.281
	BE6	.031	.053	.418	.000	.000	.096	.008	.045	.001	.036	.002	.000	.455	.436	.001	.000
	CE2	.484	.000	.013	.187	.016	.096	.000	.070	.286	.384	.141	.270	.118	.230	.039	.472
	CE3	.335	.000	.010	.093	.027	.000	.000	.495	.439	.297	.156	.247	.175	.302	.037	.163
	IE5	.063	.307	.459	.244	.280	.045	.075	.490	.000	.085	.283	.410	.340	.197	.217	.163
	IE6	.052	.101	.017	.037	.260	.001	.289	.430	.000	.137	.150	.457	.329	.361	.253	.493
	IRE9	.005	.142	.410	.150	.337	.038	.290	.081	.137	.000	.001	.001	.423	.372	.277	.254
	IRE1	.025	.230	.113	.005	.027	.001	.146	.153	.287	.150	.000	.000	.208	.240	.014	.100
	IRE1	.130	.280	.460	.016	.030	.000	.274	.244	.410	.450	.000	.000	.380	.450	.000	.000
	RE9	.091	.000	.034	.070	.045	.111	.173	.340	.324	.423	.208	.380	.000	.060	.000	.000
	RE10	.063	.210	.082	.484	.484	.436	.230	.301	.193	.367	.244	.454	.000	.390	.480	.000
	FE5	.436	.497	.449	.048	.079	.001	.030	.032	.217	.257	.014	.002	.066	.392	.000	.000
	FE6	.307	.044	.085	.103	.281	.000	.477	.163	.163	.493	.101	.005	.008	.480	.000	.000

a Determinant = .001

Table 5.15: Rotated Component Matrix for 17 Variables

	Component						
	1	2	3	4	5	6	7
BE5	.935						
BE4	.913						
BE6	.672						
IRE9		.779					
IRE16		.767					
IRE17		.701					
MME4			.797				
MME8			.791				
MME6			.676				
FE6				.914			
FE5				.859			
CE2					.904		
CE3					.902		
RE10						.907	
RE9						.821	
IE5							.853
IE6							.786

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 7 iterations.

After analysis of the Rotated component matrix and Correlation Matrix 7 factors are extracted using the same methodology as used in the factors identification for initial factor analysis of individual sections. The description of these variables is given in table 5.16. In this table CF stands for 'Combined Study Factor'.

Table 5.16: Interpretation of the Factors identified after Combined Factor Analysis

S.No.	Description	Factor Loading
<b>CF1: Attitude and motivation of Government authorities and role-clarity amidst the federal and provincial Government</b>		
BE4	Most of the infrastructure projects fall within the preview of more than one <b>State Government</b> with an involvement of <b>Central Government agencies</b> in some or the other form	.935
BE5	This involvement as stated in question no. 4 leads to the multiple and conflicting roles of different <b>Government agencies</b> and eventually has an adverse impact on investment decision of the foreign firm	.913
BE6	The major implementation problems are encountered at the <b>state level</b> , as project implementation takes place at the State level. This particular aspect undermines the FDI promotion efforts of the Government.	.672
<b>CF2: Extent of cost-recovery from users and effectiveness of dispute settlement procedures</b>		
IRE9	Institutional framework in India provides effective security mechanism for the recovery of <b>user-charges</b> in infrastructure projects	.779
IRE16	Institutional framework, in infrastructure projects in India, is effective and avoids all possible <b>conflict</b> between stakeholders	.767
IRE17	In event of disputes-arising, the <b>conflict-resolution mechanism</b> is effective in India	.701
<b>CF3: Competitive effective and stable exchange rate and healthy market growth</b>		
MME4	<b>High variability rate</b> in the value of <b>host country's currency</b> discourages FDI in the infrastructure projects, due to foreign exchange risk	.797
MME8	<b>Return On Investment</b> (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector	.791
MME6	<b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India	.676
<b>CF4: Finance through local debt and equity market</b>		
FE6	The <b>swap-market</b> in India is quite developed, to facilitate long term financing in local currency, at cheaper rates.	.914

Table 5.16 (contd.)

FE5	The <b>local-bond market</b> in India is quite developed to facilitate long term financing in local currency	.859
<b>CF5: Quality and dynamism of work environment</b>		
CE2	There is a clear divide in <b>North versus South</b> perception of “work-friendly” environment.	.904
CE3	South Indian States have <b>clean working conditions</b> as compared to, many of the otherwise “resourceful and facilities starving”, North Indian States. This is one strong reason for more foreign investment pouring in infrastructure projects in southern region of the country	.902
<b>CF6: Price volatility of the input resources.</b>		
RE10	Risk associated with <b>global price volatility</b> (petroleum products and other) influence the investment decision especially in the electricity sector in India	.907
RE9	The industries pertaining to the infrastructure sector in India, are also prone to this kind of risk (response to this variable is in reference to variable RE8).	.821
<b>CF7: Bilateral Agreements and currency convertibility/currency transfer risk</b>		
IE5	The existence of <b>double-taxation avoidance treaty</b> between host and home country plays important role in attracting FDI in infrastructure sector in India (India has DTAA, Double Taxation Avoidance Agreement with 69 countries).	.853
IE6	The ease of <b>conversion or transfer of currency</b> in India is a favourable feature towards attracting FDI in infrastructure sector as revenues generated are in local currency.	.786

Thus, the following ‘Combined study factors’ are identified through the combined analysis of the individual sections’ study variables:

- *CF1: Attitude and motivation of Government authorities and role-clarity amidst the federal and provincial Government*
- *CF2: Extent of cost-recovery from users and effectiveness of dispute settlement procedures*
- *CF3: Competitive effective and stable exchange rate and healthy market growth*
- *CF4: Finance through local equity and debt market*
- *CF5: Quality and dynamism of work environment*
- *CF6: Price volatility of the input resources.*

- *CF7: Bilateral Agreements and currency convertibility/currency transfer risk*

It is therefore observed that the results of combined factor analysis are comprehensive and take care of each factor identified in the individual sections' study factors. To corroborate the results, cronbach's alpha value was calculated for the variables of each factor and for each factor the value was more than 0.5 ranging from 0.858 to 0.560 this conveys that combinations are good and acceptable. Further to strengthen the results, cronbach alpha value of all the 17 variables, identified through the combined factor analysis, was calculated. It showed a value of 0.713 which is greater than 0.5 and hence acceptable.

### **5.5 TESTING UNIVERSAL APPLICABILITY OF THE COMBINED FACTOR ANALYSIS FACTORS**

For identifying the determinants for infrastructure sector in holistic manner, it is important to test the universal applicability of the factors identified in the combined factor analysis. The ANOVA (for more than two samples) were used to measure any significant difference in response of the segmented groups of respondents (at significant value  $p < 0.05$ ) for the analysis. Following segment of the respondents was analyzed to reconfirm the applicability of the final results:

- Profession – Power, Roads, Railways and Others

Oneway ANOVA analysis was applied on the segmented "Profession" at 95% confidence level on the seven factors of combined factor analysis and results are shown in Table 5.17. In ANOVA analysis, significant values for the profession profiles are .590, 0.430, 0.633, 0.004, 0.315, 0.430 and 0.471. Here all the p-values are greater than 0.05 except for the group 4 (factor CF4). This indicates that there is no significant difference between the profession profiles and different factor scores.



**Table 5.17: ANOVA analysis between Profession profiles  
(Power, Road, Railways and Others)**

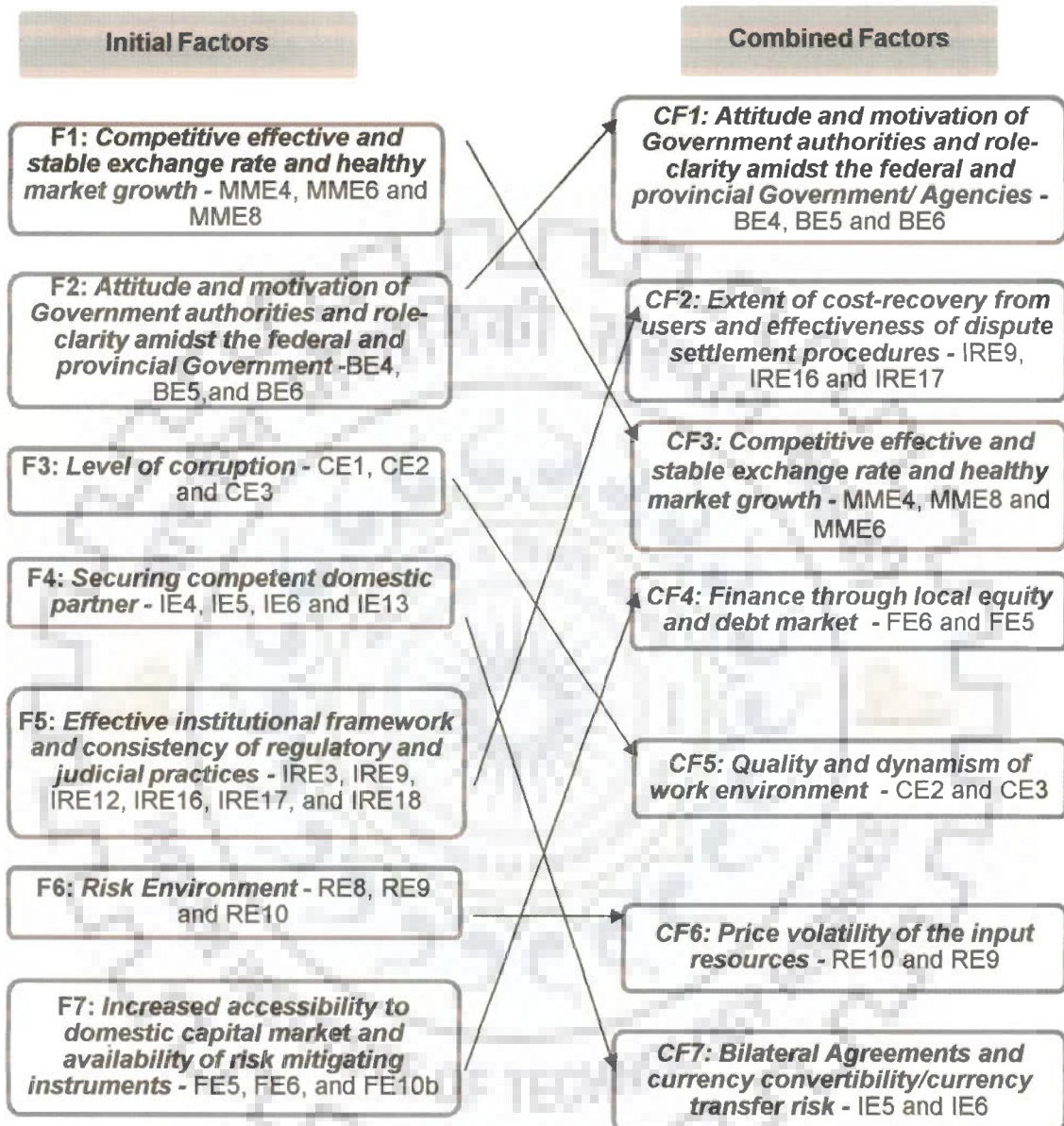
		Sum of Squares	df	Mean Square	F	Sig.
REGR factor score 1 for analysis 1	Between Groups	1.706	3	.569	.643	.590
	Within Groups	62.792	71	.884		
	Total	64.498	74			
REGR factor score 2 for analysis 1	Between Groups	2.886	3	.962	.932	.430
	Within Groups	73.282	71	1.032		
	Total	76.168	74			
REGR factor score 3 for analysis 1	Between Groups	1.891	3	.630	.576	.633
	Within Groups	77.715	71	1.095		
	Total	79.605	74			
REGR factor score 4 for analysis 1	Between Groups	13.327	3	4.442	4.944	.004
	Within Groups	63.800	71	.899		
	Total	77.127	74			
REGR factor score 5 for analysis 1	Between Groups	3.632	3	1.211	1.204	.315
	Within Groups	71.390	71	1.005		
	Total	75.022	74			
REGR factor score 6 for analysis 1	Between Groups	2.850	3	.950	.933	.430
	Within Groups	72.321	71	1.019		
	Total	75.171	74			
REGR factor score 7 for analysis 1	Between Groups	2.569	3	.856	.851	.471
	Within Groups	71.497	71	1.007		
	Total	74.066	74			

## 5.6 SUMMARY OF FACTOR ANALYSIS RESULTS AND INTERPRETATION

The results of the factor analysis presented in this chapter imply some significant conclusions. The comparison of “Individual section’s study factors: F1 to F7” and “Combined study factors: CF1 to CF7” is shown in Figure 5.7. Following interpretation may be drawn based on the comparative assessment:

- The number of individual study factor and combined study factor remain same i.e 7. However, number of variables identified is factored down from 25 to 17.
- Two factors remain unchanged only value of factor loading changes for the variables of the factors. Factor F1 and F2 of individual study factor remain unchanged and are represented as CF3 and CF1 in combined study factor. The factor loading of variables BE4 & BE5 increases in combined factor analysis while that of BE6 decreases. In case of Factor F2 factor loading of variable MME4 increases but that of variables MME 6 and MME8 decreases in case of combined factor analysis.
- In rest of the five factors one or two variables get eliminated from each of the factors as depicted in figure 5.7. Eventually, due to this factorization the essence of the factors also undergoes changes. Consequently, the factors are re-interpreted. Renamed factors are listed below
  - i. **F3: Level of corruption** - CE1, CE2 and CE3 → **CF5: Quality and dynamism of work environment** - CE2 and CE3
  - ii. **F4: Securing competent domestic partner** - IE4, IE5, IE6 and IE13  
**CF7: Bilateral Agreements and currency convertibility/currency transfer risk** - IE5 and IE6
  - iii. **F5: Effective institutional framework and consistency of regulatory and judicial practices** - IRE3, IRE9, IRE12, IRE16, IRE17, and IRE18  
**CF2: Extent of cost-recovery from users and effectiveness of dispute settlement procedures** - IRE9, IRE16 and IRE17
  - iv. **F6: Risk Environment** - RE8, RE9 and RE10 → **CF6: Price volatility of the input resources** - RE10 and RE9
  - v. **F7: Increased accessibility to domestic capital market and availability of risk mitigating instruments** - FE5, FE6, and FE10b → **CF4: Finance through local equity and debt market** - FE6 and FE5

**Figure 5.7: Comparative Assessment of the Initial Study Factors Vs Combined Study Factors**



It can be advocated on the basis of above results that the seven factors identified will play a significant role in enhancing the competitiveness of the country related to its infrastructure-investment enabling environment. These findings are exhaustively discussed in the concluding chapter, however it will be worthwhile to categories these factors into – **Basic/Vital Pillars, Competency-Enabler Pillars and Innovation/ Novelty Pillars (Box 5.1).**

**Box 5.1: Pillars of Attractiveness**

1. **BASIC/VITAL PILLARS** can be defined as basic elements of every country's competitiveness. These represent the foundation of any competitive economy.
2. **COMPETENCY-ENABLER PILLARS** can be defined as efficiency enhancers, crucial for economy to move up in the value chain. These variables act as facilitator for investing community.
3. **INNOVATION/NOVELTY PILLARS** represent the most strategic enabler of national competitiveness in the long run. Once the optimal investment level is achieved these become important for sustained growth and productivity.

These categories are created and defined by the researcher, based on her understanding of the academic knowledge gained from the study of the long standing literature on the subject of the determinants of FDI and private investment enablers in the infrastructure building. The factors are categorized as follows

- Basic pillars as identified by the researcher are CF3 and CF1
- Competency pillars identified are CF5, CF6 and CF7
- Innovation pillars are CF2 and CF4

The factors are pictorially exhibited in Figure 5.8, Figure 5.9 and Figure 5.10.

**Figure 5.8: Pictorial representation of Basic Pillars**

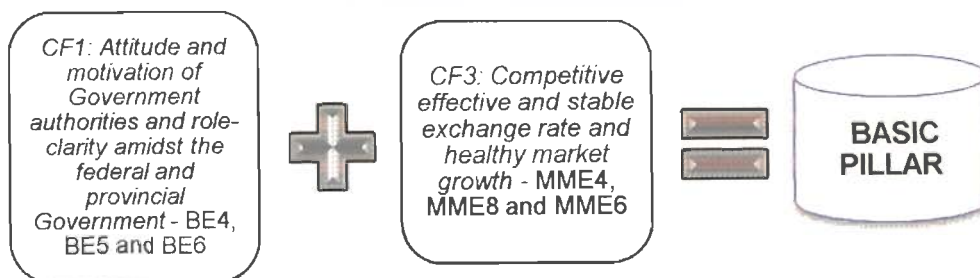


Figure 5.9: Pictorial representation of Competency Pillars

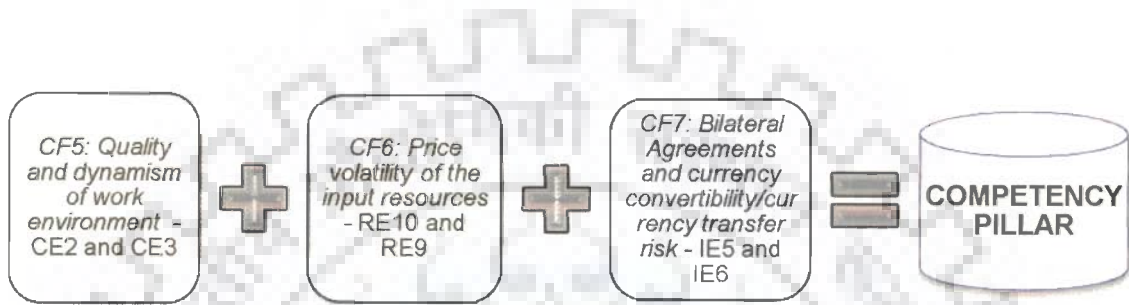
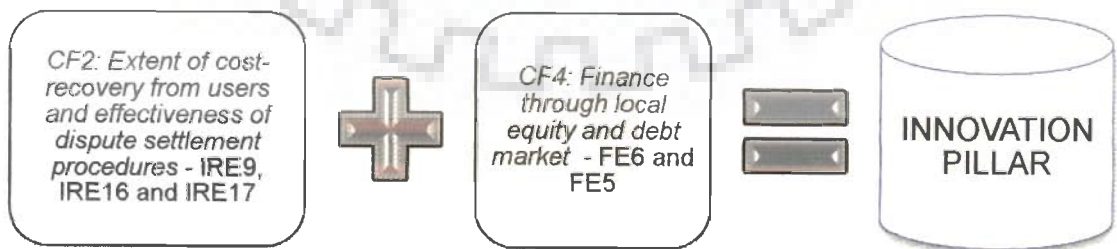


Figure 5.10: Pictorial representation of Innovation Pillars



### Endnotes

<sup>1</sup> Researcher came across few studies done on identifying determinants of FDI in India and also one of the studies (conducted by IIM Ahmedabad and Stanford University US) focusing on the automobile and pharmaceutical industries. Otherwise, there was complete dearth of studies which can provide some insight on improving the policy and business environment in India to attract FDI to finance the infrastructure development in the country.

<sup>2</sup> There are not many private infrastructure firms operating in the three sectors in India and very few foreign firms have their involvement in the infrastructure projects in the country as equity partners. Details of the FDI flowing into the power and road sector in the country are attached as appendix. Researcher has also provided the list of the private operators in the country in these sectors. It needs to be noted here that no FDI has flowed into the operation of railways in the country, for that matter there is no government policy to facilitate private operation of railways in India, presently. Due to this constraint the population size for survey was restricted and out of 357 questionnaires sent, 84 were received.

<sup>3</sup> KMO is a sampling adequacy technique. It predicts if data are likely to factor well, based on correlation and partial correlation. There is a KMO statistics for each individual variable and their sum is the KMO overall statistic. KMO varies from 0 to 1.0 and KMO overall should be 0.60 or higher to proceed with factor analysis

<sup>4</sup> *Kaiser-Meyer-Olkin (KMO) criterion*: A common rule of thumb for dropping the least important factors from the analysis is the K1 rule. Though originated earlier by Guttman in 1954, the criterion is usually referenced in relation to Kaiser's 1960 work which relied upon it. The Kaiser rule is to drop all components with eigenvalues under 1.0.

<sup>5</sup> The eigenvalue for a given factor measures the variance in all the variables which is accounted for by that factor. The ratio of eigenvalues is the ratio of explanatory importance of the factors with respect to the variables. If a factor has a low eigenvalue, then it is contributing little to the explanation of variances in the variables and may be ignored as redundant with more important factors.

<sup>6</sup> The Cattell scree test plots the components as the X axis and the corresponding eigenvalues as the Y axis. As one moves to the right, toward later components, the eigenvalues drop. When the drop ceases and the curve makes an elbow toward less steep decline, Cattell's scree test says to drop all further components after the one starting the elbow

<sup>7</sup> There are two major categories of rotations, *orthogonal rotations*, which produce uncorrelated factors, and *oblique rotations*, which produce correlated factors. The best orthogonal rotation is widely believed to be Varimax.

<sup>8</sup> The factor loadings, also called component loadings in PCA, are the correlation coefficients between the variables (rows) and factors (columns). Analogous to Pearson's  $r$ , the squared factor loading is the percent of variance in that indicator variable explained by the factor.

<sup>9</sup> Cronbach's alpha is a popular method to measure reliability to test the consistency of the group or questionnaire.

<sup>10</sup> It is seen in practice that 0.7 standard is quite high and practical data may not meet this criterion, which is why some researchers particularly for exploratory research use a lower level such as 0.4 [122]. It is advocate that in any event factor loadings must be interpreted in the light of theory and not by arbitrary cut-off levels. Common social science practice uses a minimum cut-off of 0.3 of factor-loading. Another arbitrary rule-of-thumb terms loadings as weak if less than 0.4 and, strong if more than 0.6 and otherwise moderate.

<sup>11</sup> Due to less number of likert scale questions in this section, all the 3 questions are considered for final combined factor analysis and no individual factor analysis for these two sections (CE and RE) is undertaken.





**CHAPTER 6**



## 6.1 INTRODUCTION

The developing economies around the world are striving hard to meet their growing infrastructure demand. Efficient road connectivity, regular power supply, safe drinking water, modern telecommunication system etc. are all critical for having sustained economic growth and for developing International trades. In case of India, Planning Commission has highlighted that lack of infrastructure facilities, hamper the desired growth pattern. Planning Commission has also estimated that India's infrastructure investment needs are very huge around US \$ 546 billion, and out of this about 30% investment has to come from private sector. Infrastructure development is characterized by long sunk cost, long gestation period, and high risk portfolio. Due to these drawbacks, associated with almost every infrastructure project, it becomes difficult for private investors to raise funds whose maturity matches the project completion time. Foreign direct investment (FDI) is one financing instrument which, besides providing numerous spillover advantages, is also debt free and has no short-term payment obligations. FDI is capable of influencing the development of a country's imports and exports, capital reserves, factor endowments, and terms of trade. However, the emerging and developing economies across the globe are posing tough competition to acquire this instrument of financing for developing their infrastructure.

In case of India also financing the massive infrastructure development is the most important challenge faced by the country. In the Eleventh Plan estimates India has presented a very positive figure for investment in the infrastructure building, as discussed earlier. But, despite this optimistic approach, with the current global financial crisis faced by the global industry, it is realized that the expected private funding for the projects will be short of the targeted figure. According to the latest estimates by McKinsey "India faces a shortfall of as much as \$190bn in financing key infrastructure projects, as the global crisis chokes off urgently needed capital". In such a scenario, providing the right and attractive investment environment becomes the top priority of the policy makers and the Government. The Governments across the world and the various Multi-lateral Agencies have been conducting research studies and surveys to have the perspective of the investors, regarding the facilitators of investment in a particular economy or region. A comprehensive review of such studies and other related

studies on the determinants of FDI revealed that there is a lack of substantial research on this issue pertaining to infrastructure financing in India. Except the World Investment Report 2008, which is based on the results of the investor's survey conducted by the World Economic Forum, no other research paper or survey publication has dealt with this topic in detail in the context of India.

In this research, a comprehensive study of the existing physical infrastructure facilities in roads, power and railways has been done to identify the gap in the required and available facilities. In order to have a benchmark for identifying gap a cross-comparative approach has been used. Along with this, reference is also made to figures estimated by the GoI for future growth requirements. The study focuses on identifying the factors which can result in an accelerated private investment with main focus on foreign investment in building of infrastructure facilities in the country. To identify the important underlying factors an empirical study has been conducted.

The main objectives of the present research are:

1. To critically study the state of infrastructure in India with respect to few other world economies and identifying the gap in the existing and required infrastructure facilities (as identified in the scope) and their probable impact on economic development.
2. To study the state of private sector participation in infrastructure development in India with the main focus on FDI and to do a cross-country assessment of the investment environment.
3. To examine, the Institutional, Regulatory, Market, Financial and Economic environment relating to the foreign investment in infrastructure building.
4. To identify the country-level pillars (determinants/factors) to leverage more FDI in the infrastructure building.
5. To draw suggestive guidelines to improve the overall investment climate in the infrastructure sector in the country.

The country-level pillars, determine the right macro-level (national) environment which can link effectively with the micro-level (project) conditions, and this eventually will result in increasing the commitment of foreign investors to invest in Indian infrastructure sector.

## 6.2 RESEARCH SUMMARY

The broad objectives of the present study are highlighted in the previous section. Based on the objectives, the literature review was conducted. The focus of the studies reviewed was on identifying the locational determinants of the FDI. Historically, the major studies conducted on the determinants of FDI are one that captured the overall FDI inflows into an economy. As such, none of the studies on subject of FDI [except one by [126] exclusively dealt the infrastructure sector and FDI studies on India were also few. With this constraint, the literature review was conducted under four different headings. Part I of the literature review identified the major locational determinants of FDI in general from the studies. Part II focused on studies that established the determinants of FDI to India, in Part III studies on private sector participation in infrastructure development were reviewed to capture the investor's perspective on country-level environment. The last part of the literature review focused on the studies and researches conducted by the various developmental agencies that focused on finding the constraints and impediments to private sector participation in infrastructure sector. Based on the review of this literature study, broad categories of variables were identified which visibly had great implication on the investor's investment decision. These are Market and Macroeconomic variables, Business Environment variables, Corruption variables, Institutional and Regulatory variables, Investment Environment variables and Financial Market variables.

Apart from this, it was also realized that it is important to analyze the existing secondary data on the country level enabling environment pertaining to FDI. It is a well-established fact that many of the economies are striving hard to attract this funding type for the purpose of developing infrastructure facilities (*World investment Report, 2008*). However, only a few have succeeded in fetching an appreciable amount in infrastructure development and many are still struggling to raise funds through this equity type. It is important to understand in terms of the host country specific investment and business environment; the facilities provided which are effective in attracting huge FDI to these countries especially in the infrastructure sector. The analysis of FDI inflow into a few identified economies was done vis-à-vis their rankings on certain identified factors (refer section D in chapter 3). It is understood that the weightages which these factors achieve under

various economies' regime are the result of policy reforms or policy deterioration in the economy. In order to attract more foreign equity into infrastructure, the effort of the economies should be to maximize their scores for these factors. The factors highlighted here were in consonance with the variables identified in the literature review.

To accomplish the first objective of the research, i.e, to assess the physical status of existing facilities in the identified infrastructure facilities, a secondary data analysis was done. The targets set by the Government of India for the different sectors, roads, power and railways and the current infrastructure status of few other countries, namely China, Mexico, Brazil and US is taken as benchmarks to enumerate the existing gap in the infrastructure development in India. For this purpose, reference is made to the growth trends in the sectors vis-à-vis other sectors. For instance, GDP growth rate and manufacturing growth rate were compared to study the impact of road development on the industry. The analysis, advocated that the present pace of infrastructure development is inadequate in India as compared to other developing economies. Also, the quality of infrastructure as compared to the other countries is far below the expected standard. This poor state of infrastructure will be a serious threat to the economic and trade growth in the country. Realizing that there is scarcity of infrastructure development funds, the need is to find new sources of financing the needs of this sector. FDI has been identified as one major investment source, but there are many obstacles in the macro-environment that deters the FDI inflow into this sector in India. The focus of this study is to examine the existing macro-environment in the country pertaining to infrastructure investment and to identifying the factors that need to be prioritized at the macro and where ever possible at the micro –level to fetch in enhanced private funding into the infrastructure building.

To achieve this, a questionnaire was designed to capture the views and perspectives of the respondents, in order to find somewhat precise answers to the following important questions

- What are the main drivers of the investment to the infrastructure sector in Indian economy?

- What is the perception of the respondents with respect to the existing country- level environment related to investment in the infrastructure sector?
- What are the investors really searching for?

In order to identify the grey areas and highlight the gap between the existing and desired environment, the questionnaire was e-mailed and handed in person to four sets of respondent. As mentioned earlier, the scope of the research work would be limited to three main sectors of infrastructure namely – Power, Roads and Railways. The three broad categories of respondents were executives and professionals from the firms operating and working in the power, roads and railways sectors. Here one important consideration was that due to the shortage of foreign infrastructure operators in India the responses were also collected from the private firms which have received FDI. Apart from this, it was also understood that the legal consultants, bureaucrats and academicians associated with this sector also hold strong views about the existing environment in India, so a fourth group was considered consisting of management and legal consultants, policy advisers in various concerned ministries and departments and academicians in reputed Indian and International institutes.

While analysing the inputs received from the respondents, a basic conceptual analysis was done first and then empirical assessment was conducted applying factor analysis technique and using SPSS software. The intention of conducting basic conceptual analysis was to identify the category-specific perception differences in the choice of variables. Finally, using factor analysis a set of factors were identified that substantially represented the groups that should be prioritized to enhance India's attractiveness to private specifically foreign investment in the infrastructure development.

### **6.3 PLAN OF THE STUDY**

The plan of any study is a sequential outline of the broad components and provides a structured flow to the study. It is regarded helpful for the systematic analysis of the problem and therefore should be carefully designed to assist in providing an orderly approach towards objective attainment. The chapter plan of the present study is designed to cover the concerns which are important to the

research study and critical to the identified objectives. The whole study is comprehensively covered under six chapters. The chapter plan is as follows:

**Chapter 1 – Introduction:** It provides an introductory view of the study and frames the context for the study. It also includes a description of the research methodology in terms of the objectives, scope and basic approach.

**Chapter 2 – Literature review:** It has been devoted to a survey of the relevant literature

**Chapter 3 – (a) Infrastructure in India:** This chapter describes the present status of the physical infrastructure in India. It also discusses about the existing institutional framework in each sector, and identifies the gap in infrastructure availability both in terms of physical and financial status.

**(b) FDI in India:** This part of chapter discusses the present status of FDI in various sectors in country. Also, efforts are made to analyze the country specific enabling environment pertaining to investment. A cross-country comparative approach is adopted in analyzing the secondary data collected in both the sections.

**Chapter 4 through Chapter 6** is the core of entire study. **Chapter 4** presents a cross-sectional perception analysis of the existing macro-environment pertaining to the infrastructure investment in the country. This chapter is mainly based on the presentation and preliminary assessment of the responses received from the different categories of the respondents. **Chapter 5** using the sample data, attempts to 'predict' the broad country-level pillars (factors) for improving Indian investment environment to expedite the process of infrastructure building in India. The prediction is based on factor analysis of the sample data and reconciliation of the cross-perception of the different categories of the respondents. **Chapter 6** provide the summary of the work done and concludes the research followed by recommendations for the policy-maker and Government. **Bibliography** and **Annexure** are exhibited at the end.

In the forthcoming part, significant contribution of the research and major findings are concluded followed by a set of recommendations. The thesis finally ends with the recommendations and suggestions for future research.

## 6.4 KEY FINDINGS AND CONCLUSIONS

The significant contribution of the present thesis is the identification of the country-level pillars (factors) to attract more FDI to infrastructure building in India. India is the world's largest democracy and holds one-sixth of the world population and with its extensive growing market and highly diversified industry it is increasingly becoming a key player in the world economic landscape. In the recent World Investment Report, 2008 it has been highlighted as the most favorite investment destination by the international investors and global investor's perception survey has also highlighted the investor's preferences for investing in building the Indian infrastructure. However, a number of shortcomings continue to affect India's competitiveness landscape which prevents the country from fully utilizing its investment potential. The results of this thesis provide a unique assessment of the country's main competitiveness flaws and strengths to overcome the existing shortcomings. It also provides an in-depth analysis of the issues which are crucial for long-term investment growth in the infrastructure development in India. Through empirical analysis of the responses, three major pillars of competitiveness are identified. These three major pillars – **BASIC PILLARS, COMPETENCY PILLARS** and **INNOVATION/NOVELTY PILLARS**, provide a thoughtful account of 17 sub-pillars which remain as the main challenges in upgrading the investment-enabling environment for building required infrastructure network. These shortcomings should be addressed by a joint effort of the Government, Bureaucracy, the Business Community and the Civil Society. By doing so, the country may generate long-term finance through private sector participation and meet its infrastructure investment needs. The following part provides an in-depth assessment of the three pillars.

### **BASIC PILLAR**

Basic Pillar captures two factors CFI and CF3. CF1 highlights the importance of relationship shared between Central and State Governments. The results advocate that the cordiality of the relationship shared between the Central and the State Governments have great implication on the locational choice of the investors. Physical infrastructure projects, owing to their huge size usually fall within the purview of more than one State Government. Also, due to the complex nature and high gestation period of the projects Central (Federal) Government

also plays a crucial role in the project development and implementation stage. As such there is significant involvement of Central Government agencies in some or the other form. This involvement often results in the duplication of the roles and also results in the conflict of interest, if the political parties in power at both the levels (Centre and State) do not share congenial relations. Infrastructure projects have long project life and involve multiple agencies running over the development stage to implementation to operation and management stage. Any delays or incapability displayed on part of any of the agencies results in the delay in project and eventually leads to cost escalation and higher user-charges. Relationships between different public agencies tend to be governed by processes, which do not lend themselves easily to be service-oriented, customer friendly and efficient [142]. For instance, Delhi-Gurgaon expressway, which was launched in 2001 and was first of its kind in India (as it involved negative grant), the project became operational in January 2008 after a delay of two years (See Box 6.1).

Factor CF3, highlights the macro-economic element that features prominently in investors' decision-making and add to the attractiveness of the country as a potential investment destination. This particular aspect is also highlighted in the literature, it is advocated by a considerable number of studies that an investor is more inclined to invest in a country, which displays a healthy GDP growth and have a competitive exchange rate. Consistency in the growth rate is an indicator of the prospective market growth and effectiveness and stability of the exchange rate is an assurance of the sufficient return on foreign investor's capital. Indian environment related to this factor is very strong as country has exhibited good growth rate in the last few years and country also offers an effective exchange rate and Indian rupee has not experienced much volatility in its exchange rate value in the last few years.



**BOX 6. 1: CASE- DELHI-GURGAON EXPRESSWAY**

The project envisaged 8-laning of the busy section of National Highways 8 between Delhi and Gurgaon. This comprises a 27.7km long signal free 8-lane toll facility and of the total length 9.7 km lies in Delhi and rest in Haryana. The construction of the expressway involved as many as 17 agencies. The original model for 9 out of 11 flyovers of the project was re-worked number of times, due to design changes made by the Delhi and Haryana Government. Moreover, the concessionaire DS Constructions Ltd. faced issues during the development stage, due to delays in handing over of the project land by the respective Governments. Further, the Airports Authority of India and Ministry of Defence refused to tender the land and it took around two years to finally acquire the land. Delays were also caused due to delays in shifting of the 66kV line by BSES and the relocation of GAIL pipelines. These delays resulted in the project-cost escalation from INR 5.5b to INR 7.1 billion, escalation of about 29 percent.

Source: JSA, 2009

**COMPETENCY PILLAR**

Competency Pillar captures three factors CF5, CF6 and CF7. Competency pillar advocates factors which are efficiency-enhancers and act as facilitators for the investing community. Factor CF5, considers the quality and dynamism in the work environment as an important determinant of investment. The assessments of the responses suggest that the Indian States displaying investor friendly work environment and responsive, reactive bureaucracy are more attractive as potential investment destination for the investors. A review of the official statistics on Gol's PPP website suggests that majority of the private sector projects are concentrated in the Southern and Western part of the country. South Indian States of Andhra Pradesh, Tamil Naidu, Karnataka and Western States of Maharashtra, Gujrat and Rajasthan have been the forerunners in the reform processes and exhibit the maximum number of infrastructure projects with private participation. Taking lead from this, it is awarded that States that do not facilitate private participation and display transparency in their work-process would appear last or may even not appear in the foreign investor's list of preferential locations. It is investor's general perception that projects in such location which are meant to be developed with

private participation may suffer and result in delays and cost-escalation and hence may not be viable. On a less positive notion, it is realized that Indian bureaucracy and Government offices lack in providing transparency in handling of the privatization procedures and in facilitating simplicity in project-approval and implementation procedures. Country's rating in the Transparency International's Corruption Index is very poor and is characterized by delays in project approval, red tapism and bribery all this contribute to the creation of unpleasant business environment in which it is difficult for both domestic and international firms to operate and generate profit. These further advocates for simplification of the project approval and implementation processes as very large number of agencies are involved in the interface with the private party and this consequently increases the prospects of indulging in unfair means of operations to speed up the overall project development process.

Factor CF6 highlights that too much volatility in the prices of the input resources may result in restricting the amount of foreign investment. This suggests that much dynamism in the price-indices of the country's commodity market is not appreciated. India has shown consistency in this front for long except for the last few months which may be attributed to the global financial meltdown to great extent. Factor CF7 focuses on the tax regime applicable on foreign investors in the infrastructure projects and the currency convertibility risk. The survey responses exhibited that foreign investors designate great importance to bilateral treaty between the host and the home countries. India has bilateral agreements with 69 countries and a review of the FDI inflow statistics in chapter 4 suggests that majority of the countries of origin for FDI are one with which India has signed the bilateral treaty. In case of infrastructure projects this is a very important aspect to be considered by the foreign investors as the earnings are in local currency while the profit has to be repatriated in the home country currency. Due to bilateral tax treaty, the investor is protected from double taxation clause and is in turn able to maximize its profit. Ease of currency convertibility is another important reason for investors to choose India as a preferred investment destination.

**NOVELTY/ INNOVATION PILLAR**

The factors that appear in the innovation pillar are CF2 and CF4. Factor CF2 focuses on the project specific drivers – user charges and dispute resolution mechanism. Both these variables are effectively under the preview of institutional arrangements existing in the respective sectors. The effectiveness of both these variables depends on the efficiency and autonomy of the regulatory and the legal institutions of the country. In India, there are regulatory authorities in most of the infrastructure sector except a few like roads, these regulatory authorities are responsible for deciding the user-charges for particular project in their respective sectors. There exists a detailed methodology and process for arriving at the optimum prices for the services. However, in Indian context traditionally infrastructure services have been seen as a public good and the concept of user-charges have been notionally missing from the whole landscape. Even, if it exists it is highly subsidized which has been the major cause of the poor performance of many public utilities in India, for instance many of the State Power Utilities have been running in huge losses due to this subsidized prices of the services. The tariff recovered from the user-charges in various sectors failed to meet even the operational expenses [73]. In such a scenario, a private investor, specifically, a potential foreign investor will shy away from the sectors and society with a culture of not paying for the facilities and where cost recovery is not a viable solution. As highlighted by the survey results that extent of cost-recovery for running the infrastructure provision is a crucial determinant of investment decisions. There is a need to prioritize the cost-recovery formula by the Government.

Further, the factor captures the importance of the effectiveness of dispute resolution mechanism. Infrastructure projects involve large number of stakeholders and are complex by their basic character; experience has shown that disputes and litigation may arise in the lifespan of the project. In this concern, the investor community gives importance to the effectiveness of the legal framework for settling disputes and more importantly the speed and independence of the jurisdiction. As per the responses investors in India are quite wary of the dispute resolution mechanism. India being a democratic country and existence of independent judiciary provides easy access to the legal institutions by all the stakeholders and activist groups, where anybody can file litigation and exercise a

stay on the project. Traditionally, arbitration and dispute resolution tend to be very cost consuming and add to the project-cost, this may render the investment undesirable.

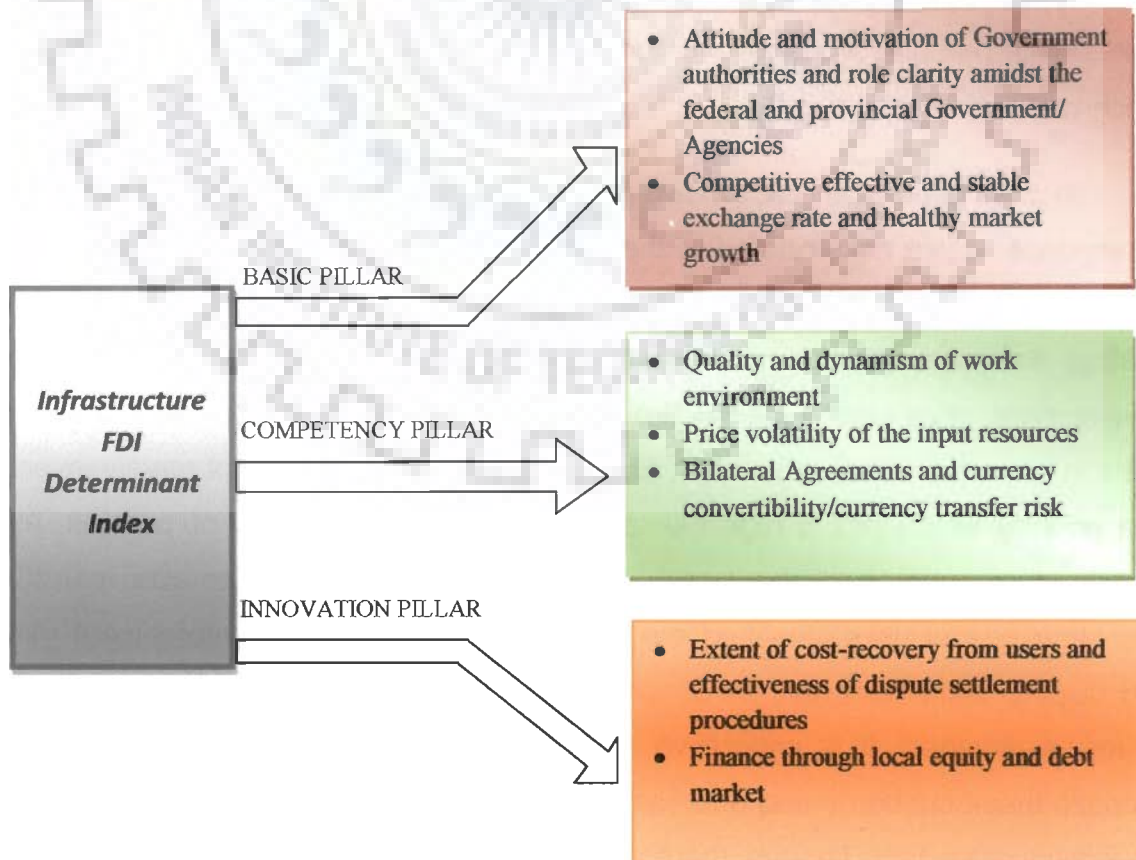
Factor CF4 highlights the important financial market enablers which can trigger infrastructure investment decisions. CF4 focuses on two elements of the domestic financial market – bond market and swap market, which can enable foreign investors to find adequate financing (equity and debt) in local currency for the infrastructure projects. Infrastructure projects are capital intensive, investment is long-term and involve multiple and often unique risk. Experience has shown that debt to equity ratio in infrastructure projects is usually 70:30. The investor community will be confident to invest only in locations and projects where the financial market has appetite for long-term and steady cash flows for rest of the needed investment. In such a scenario, degree of development of the local equity and bond market is critical to capture investors that have capabilities to understand and absorb any risks associated to the local financial market. Bond market can be accessed for financing projects in two ways – Utilizing the bond markets through securitization of existing project's operating revenue as collaterals; utilizing the bond markets to repay existing project financing by issuing corporate bonds. Bond market is a well recourse instrument of financing in the developed world – for instance the Cross –Harbour Tunnel, a transit facility between the Kowleen area and Hong Kong Island. This project is one of the six infrastructure projects, which the Hong Kong Government has securitized. Toll revenues generated were securitized as collateral, and bonds were issued through Hong Kong Link 2004 Limited and sold to private investors. In Indian context, so far financing methods have traditionally relied on banks for taking loan. However, keeping in pace with the growth and increasing demand from different sectors it is obvious to turn to the domestic capital market for long-term funds. Efforts are underway to develop corporate bond market in India, country has already experimented with the municipal bond markets [93] and achieved success in it – for instance, Municipal Bonds issued by Ahmedabad Municipal Corporation, it got AA(SO) rating by CRISIL.

The second variable highlighted from the perspective of foreign investment is the development of swap market in the country. ADB is playing an active role in

developing the capital market for infrastructure financing in India, it has introduced a new mechanism of currency-swap for infrastructure projects, under which it will swap its hard currency for local currency (Rupees in case of India) for tenor stretching up to 15 to 20 years. The local currency will be lent to the infrastructure project developers without any sovereign guarantee but a proper credit rating of the project will be required. In this case, the host Government is simply a facilitator. In the international market, swaps are used to hedge certain risks as interest rate risk. Interest rate swaps become a lucrative option for investors who wish to take benefit from the comparative advantage of shifting from fixed rate loan in host economy to floating rate loan in home economy or vice-versa. In India, the swap market is not very deep, it is expected that if such kind of arrangements are encouraged, it will lead to an increased participation of the foreign investor and act as catalyst in triggering the FDI.

The above conclusion (based on the factor analysis result) has been crafted in the form of “Infrastructure FDI Determinant Index” in figure 6.1.

**Figure 6.1: Infrastructure FDI Determinant Index**



The section on risk environment could not be comprehensively assessed by factor analysis as questions 1- 7 in the section were not based on likert scale and hence not included in the factor analysis. However, assessment of the risk environment for the infrastructure projects is very important in the light of the complex nature of infrastructure projects – capital intensive, many stakeholders, long-gestation period, public-good notion, multiple agencies involvement etc. With this background, in the following section a summary of the findings, as interpreted from the analysis of this part of the risk environment section in chapter 4, is provided. Respondents were asked questions pertaining to – Political risk, Commercial risk, Legal risk, Developmental risk, Construction completion risk and Operating risk. Commercial and Political risk were assessed to be the greatest in the case of India, and are one which the investor would prefer to hedge before they make investment in the infrastructure projects in India. The likely reason for being wary about commercial risk is that in case of India, historically it is observed that implementation of an effective user-charge for the infrastructure related services have been out of context due to vote bank politics of India. Secondly, the fear of sudden changes in the policy or rolling back of policies is another crucial matter for investors. The respondents felt that customer base forecasting risk and interest rate risk are two most important commercial risks which hold significant concern of the stakeholders.

In case of political risk, top two risks as identified by the substantial number of respondents are risks related to the policy changes and sovereign risk. Policy risk, relates to the changes in the infrastructure policy, mainly, Government yielding to pressures from interest groups opposing to the infrastructure development, price setting policy. The degree of political risk of a country is a key factor in making the investment decision. A potential investor will not readily invest in a country which has a high risk associated with the change of policies, as infrastructure projects involve heavy sunk cost and have long gestation period. The other crucial risks identified are land acquisition risk, law enforcement risk and dispute settlement risk. In Chapter 4 a comprehensive discussion of these issues is provided. It is imperative for the Government and policy makers to prioritize these concerns and address them in the standard documents related to the individual sectors. Though, there are clauses related to the allocation of risk in the standard agreement documents but it is not enough to mitigate all these risks.

For instance, in the latest MCA for NHDP projects there is a clause which provides that 50% (this was 80% earlier) of the land will be procured by the Government prior to contract implementation and rest will be procured by the private developer. Experience has shown that it has been difficult on first instance for the Government to procure land timely without delays, and secondly when private developer has to procure the remaining part of the project land, the bargaining power of the land owners increases appreciably, realizing that it is the necessity of the project developer to procure their land. In the background of such policies, it is important that risk-mitigation market is deeply secured in India.

The research findings deem that India presents basic environment necessary for becoming one of the most favoured destinations for infrastructure investment, provided that the obstacles discussed above are tackled. In following section, the researcher has suggested some remedial measures.

### **6.5 Recommendations and future research options**

The researcher has made following recommendations -

- To accelerate infrastructure investment in the country it is important for both the Federal and State Governments to commit their goodwill and create the commonality of goals. Clarity in the roles, functions, power and obligations allocated to Governments at different levels and different agencies engaged in the infrastructure services is imperative. While Central Government and Central agencies/departments show a great zeal in undertaking reforms to attract foreign investment but the same amount of eagerness is not shared by the various State Governments. The role of State administration is very crucial in implementing the projects as major approvals related to land allocation, environmental clearances, electricity loads, water access etc. are sanctioned by them. It is an important activity to streamline the processes at the State level otherwise reforms at the Centre will not prove to be beneficial. The policy makers can think of creating an empowered agency at the State level to grant all the requisite approvals for all the relevant infrastructure projects on priority basis.

- Results highlighted that there is an involvement of number of agencies in the development stage of the project, this results in the lack of co-ordination among the different agencies, leading unnecessarily to project delays and cost – escalation. Also highlighted is that land acquisition risk is the greatest risk apprehended by the project developers and investors. According to India Infrastructure Report 2009, an official review of the projects that have been delayed indicates that 70% of the 190 delayed projects are on the account of land acquisition problem. In such a scenario, where domestic infrastructure investors are suffering due to large number of approval processes and land acquisition risks, the foreign investors will be more wary of entering the sector in the absence of proper land acquisition and valuation process and lack of co-operation from different agencies and State Governments. Researcher advocates that in order to avoid the risks associated with the land acquisitions, and lengthy and complex approval processes policy makers should ensure that all the approvals and land acquisition processes should be completed before project procurement and contracting.
- The other important highlighter of the results is the recovery of user-charges so as to make the project viable for private investment. Indian policy makers have already realized the criticality of this variable for achieving the desired investment level in the sector and have provisions in place in the form of Standard Documents to make sustainable the sector-economics for private sector involvement. However, it is also realized that with the involvement of international investors and advanced technologies the cost of services is likely to be somewhat expensive as compared to the cost of services in the pre-reform periods. In this context, it is important for the Government to build the civil society's willingness to pay for the provision of key services (barring the small minority which cannot afford the services and the Government has to have provisions for that part of the population through subsidies. But the criteria and provisions for seeking subsidies have to be very strict). In order to achieve this Policy makers/ Government would have to work to establish efficient communication channels with the society to make them understand the expected benefits. It is a long repetitive process which Government should effectively undertake with the concerned stakeholders prior to every big project.



- Government has already placed the dispute resolution mechanisms in place in terms of modalities defined in the standard documents and creation of appellate tribunals. However, in case of infrastructure projects, involving foreign investors, any event of dispute resolution may involve domestic or international tribunals which may prove to be time consuming and a costly affair. Government should alternatively provide for provisions that may provide generic solutions to the dispute and may not always require involvement of tribunals. Further, the dispute resolution process should be very flexible to accommodate appropriate deadlock breaking mechanism through dialogue.
- Govt is already committed to develop its domestic capital market and efforts are already underway geared to deepen the corporate financing through stock market. However, Government needs to focus on creating the instruments exclusively for facilitating the infrastructure bond market. Another alternative approach could be an issuance of global bonds, to capture the investments from non-resident Indians. Further, Ministry of Finance and RBI will have to play proactively in re-defining the role of NBFCs, in which infrastructure holding companies can successfully fund projects for building big physical infrastructure projects. Further, the exit norms for these kinds of investors will have to be strategically worked out. As some of these funds could be interested in exiting before listing of the shares. In such a case, if the benefits extended to listed shares traded on the stock exchange for e.g – long term capital gain tax exemption, are not extended to shares which are sold before pre-listing will discourage the investment from the funds who are interested in taking project development risk.

### **Future Research**

The present research study focused on identifying the pillars of attractiveness for the foreign investment in infrastructure building. The research, jointly highlighted the issues and concerns of the three core sectors of infrastructure namely – road, power and railways. However, there are few limitations of the present study, these are listed as follows:

- The present research basically focused on the broader issues in attracting Foreign Investment to the three major

sectors. However, during the interaction with the respondents of the survey, it is felt that domestic private financing is also an important contributor to building of infrastructure in India.

- It is realized during the research process that each and every variable has great implication on the investment-environment and the extent and the nature of the effect varies from one sector to the other.
- Also, it is observed that survey result of this study provide a broader perspective of the identified variables and the comprehensive research on individual identified variables separately in each sector is impertinent to develop a policy environment conducive to the smooth development of infrastructure in the country
- The present study has a major focus on main physical infrastructures – power, road and railways. However, it is realized that there are sectors in urban infrastructure field which are receiving great attention of foreign as well as domestic private investors and need further research attention.

Therefore, it is advocated that future research may be taken with individual consideration towards these major emerging sectors in India. Further, it is also suggested that future research may be taken to conduct factor-specific diagnostics about relative sector strengths and weaknesses in attracting private infrastructure investment. For instance, “risk-profile of the investment opportunity” is central to every investor (debt or equity and whether foreign or domestic investor) and all investment decisions hinge to it that whether the investing opportunity is value for money and worthwhile.

With almost one and half decade of experience with the privatization programme of infrastructure facilities in India, the country is still in the process of developing an understanding about the extent, nature and complexities of the private sector involvement. Governments across the world have experimented with various modes of involving private sectors, specifically, transnational

corporations to benefit from their technological strengths. In this process of internationalization of the infrastructure assets they have learned various lessons. Countries like India, which are in middle of the process of involving foreign affiliates, need to consider many factors when seeking foreign participation. The biggest challenge the policy makers face is “in what way to promote the involvement of the foreign investors and how to attract the desirable forms of foreign investment?” The findings of this thesis answer these questions to a great extent. It is left for the discretion of the Policy makers/Government to decide that what kind of policies they will put in place in order to achieve the desired results.



## BIBLIOGRAPHY

- [1]. Abilava, H. "Explaining Foreign Direct Investment in Transition" Economics Education and Research Consortium, MA Thesis, National University "Kyiv-Mohyla Academy" (2006)
- [2]. ADB, "Investing in Sustainable Infrastructure: Improving Lives in Asia and Pacific" Publication No. ARM090554, Philippines (2008)
- [3]. Agarwal, J "Determinants of Foreign Direct Investment: A Survey", *Weltwirtschaftliches Archive*, vol. 116, issue 4, pp.739-773 (1980)
- [4]. Ahuliwalia, M. S. "India's Economic Reforms: An Appraisal" in "India in The Era of Economic Reforms" (ed) Jeffery D. Sachs, Ashutosh Varshney and Nirupam Bajpai, Oxford University Press, New Delhi (1999)
- [5]. Ali, F., Fiess, N. and MacDonald, R. "Do Institutions Matter for Foreign Direct Investment", Department of Economics, University of Glasgow, Working Papers No. 2008-26 (2008)
- [6]. Alworth, J., "Taxation and Integrated Financial Markets: The Challenges of Derivatives and Other Financial Innovations," *International Tax and Public Finance*, Springer, vol. 5, issue 4 pp. 507-534 (1988)
- [7]. Archana, V., Nayak, N.C. and Basu, P. "Foreign Direct Investment in India: Emerging Horizon", *Indian Economic Review*, vol. 42, issue. 02, pp. 225-266 (2007)
- [8]. Aschauer, D.A. "Is public expenditure productive?" *Journal of Monetary Economics*: vol.23, issue 2, pp 177-200, (1989).
- [9]. Asiedu, E. "On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?" *World Development*, vol. 30, issue 1, pp. 107-118 (2002)
- [10]. Banerjee, S.G., Oetzel, J. and Ranganathan, R. "Private provision of infrastructure in emerging markets: do institutions matter?", *Development Policy Review*, vol. 24, no. 2, pp. 175-202 (2006)
- [11]. Banga, R. "Trade and foreign direct investment in services: a review", Indian Council for Research on International Economic Relations, Working Paper no. 154, New Delhi (2005)
- [12]. Bardhan, P. "Corruption and Development: A Review of Issues" *Journal of Economic Literature*, vol. XXXV, issue. 3, pp.1320-1346, (1997)

- [13]. Barro, R. J. "Government spending in a simple model of endogenous growth," *Journal of Political Economy*, vol. 98, issue 5, pp 103-125 (1990)
- [14]. Blejer, M. and Khan, M "The Foreign Exchange Market in a Highly-Open Developing Economy: The Case of Singapore" *Journal of Development Economics*, vol.12, issue 1-2, pp 237-249, February (1983)
- [15]. Blejer, M and Khan, M "Government policy and private investment in developing countries," *International Monetary Fund, Staff Paper No. 31*, Washington DC (1984)
- [16]. Blomstrom, M. and Kokko, A. "Regional Integration and Foreign Direct Investment: A Conceptual Framework and Three Cases", *World Bank, Working Paper 1560*, 2-17 (2001)
- [17]. Blonigen, Bruce A. and Ronald B. Davies. "The Effects of Bilateral Tax Treaties on US FDI Activity," *International Tax and Public Finance*, vol.11, issue 5, pp 601-22 (2004)
- [18]. Blonigen, Bruce A., Christopher J. Ellis, and Dietrich Fausten. "Industrial Groupings and Foreign Direct Investment" *Journal of International Economics*, vol. 65, issue 1, pp. 75-91 (2005)
- [19]. Borensztein E. & De Gregorio, J. & Lee, J-W. "How does foreign direct investment affect economic growth?1," *Journal of International Economics*, Elsevier, vol. 45, issue 1, pp 115-135 (1998)
- [20]. Boskin, M. J. and Gale, W. G. "New Results on the Effects of Tax Policy on the International Location of Investment," *NBER Chapters*, in: *The Effects of Taxation on Capital Accumulation*, National Bureau of Economic Research, pp. 201-222 (1987)
- [21]. Brenten, P., Di Mauro, F. and Lucke, M. "Economic Integration and FDI: An Empirical Analysis of Foreign Direct Investment in EU and in Central and Eastern Europe" *Empirica*, vol. 26, issue 2, pp 95-121 (1999)
- [22]. Carter, L. and Bond, G "Financing Private Infrastructure: Lessons of Experience No. 4" *IFC Publication*, ISBN 0-8213-3822, Washington DC, (1996)
- [23]. Caves, R. E., *Multinational Enterprise and Economic Analysis*, Second Edition. Cambridge, New York and Melbourne: Cambridge University Press. (1996).

- [24]. Chanderpalert, A. "The Determinants of US Direct Investment in Thailand: A Survey on Managerial Experiences", *Multinational Business Review*, Fall 2000, pp 82-88, (2000).
- [25]. Collier, P and Pattillo, C. "Investment and Risk in Africa", New York: St Martin's Press: London: Macmillan Press (2000)
- [26]. Crow, Robert T. "Foreign Direct Investment in New Electricity Generating Capacity in Developing Asia: Stakeholders, Risks, and the Search for a New Paradigm", Asia/Pacific Research Center, Stanford University, Stanford, CA (2001)
- [27]. Dailami, Monsoor and Klein, Michael "Government Support to Private Infrastructure Projects in Emerging Markets", in Irwin, T., Klein, M., Perry, G. E. and Thobani, M. (eds.) "Dealing with Public Risk in Private Infrastructure", The World Bank, Washington, D. C.(1998)
- [28]. Data Monitor, India's Logistics Outlook-2007, London 2007
- [29]. Data retrieved from website [www.inboundlogistics.com](http://www.inboundlogistics.com)
- [30]. Daude, C and Stein, E. "The Quality of Institutions and FDI", Conference Paper at Latin American Meeting of Econometrics Society and VI Annual Meeting of the LACEA, Uruguay, October (2001)
- [31]. De Soto, "The Mystery of Capital: Why Capitalism Triumphs in the West and Fails in Everywhere Else" New York, NY: Basic Books (2000)
- [32]. DeCostre, G. P. and Strange, W. "Spurious Agglomeration" *Journal of Urban Economics*, Elsevier, vol.33, issue 3, 273-304 (1998)
- [33]. Deloitte, "Modernisation of trucking industry," A Report, Advisory Group of Trucking Industry, India (2003)
- [34]. Demetriades. P "Intertemporal output and employment effects of public infrastructure capital: evidence from 12 OECD economies," *The Economic Journal*, vol. 110, issue 465, pp. 687-712, (2000)
- [35]. Department of Road Transport & Highways, India Annual Report, New Delhi (2008)
- [36]. Doh and Ramamurti, "Rethinking Foreign Infrastructure Investment in Developing Countries", *Journal of World Business* vol. 39, issue 2, pp. 151-167 (2004)
- [37]. Donaldson, A "Social Development and Macroeconomic Policy", *Development Southern Africa*, vol.14, issue 3, pp.447-462 (1997)

- [38]. Dunning, J. H. "Trade, Location of Economic Activity and The Multinational Enterprise: A Search for Eclectic Approach" in International Allocation of Economic Activity, ed. B. Ohlin, P.O. Hesselbrn and P.M. Wijkman, New York, Holmes and Mier, (1988)
- [39]. Dunning, J.H. "Global Capitalism, DFI and Competitiveness", Edward Elgar, Cheltenham, United Kingdom and Northampton, (2002)
- [40]. Dunning , J. H. "Multinational Enterprises and Global Economy", Wokingham England: Addison-Wesley Publishing Company, (1993)
- [41]. Dunning, J. H. "The Eclectic (OLI) Paradigm of International Production: Past, Present and Future," International Journal of Economics and Business, vol. 8, issue 2, pp. 173-90 (2001)
- [42]. Dunning, J. H. "Explaining Changing Patterns of International Production: In Defence of the Eclectic Theory", Oxford Bulletin of Economics and Statistics, vol 41, issue 4, pp. 269-95, (1979)
- [43]. Edwards, S. "Capital Flows, Foreign Direct Investment, and Debt-Equity Swaps in Developing Countries", NBER, working paper no. 3497 (1990)
- [44]. Eicher, T. and Kang, J. "Trade, Foreign Direct Investment and Acquisiton: Optimal Entry Modes for Multinationals", Journal of Development Economics vol. 77, issue 1, pp. 207-228 (2005)
- [45]. Erdal, F and Tatoglu, E. "Locational Determinants of Foreign Direct Investment in an Emerging Market Economy: Evidence From Turkey", Multinational Business Review, Vol. 10, Issue. 1, spring (2002)
- [46]. Esfahani, H and M.T. Ramierz "Institutions, infrastructure and Economic Growth.", Journal of Development Economics, vol. 70, issue 2, pp. 443-447 (2003)
- [47]. Fan Shengenn, Hazell Peter and Throat Sukhdeo "Linkages between government spending, growth and poverty in rural India," Research Report 110, IFPRI, Washington D.C (1999)
- [48]. Fergusson, R., Wilkinson, W. and Hill, R. "Electricity Use and Economic Development", Energy Policy, vol. 28, issue 13, pp. 923-934 (2000)
- [49]. Filippov, Sergey & Guimon, Jose, "From Quantity to Quality: Challenges for Investment Promotion Agencies," UNU-MERIT Working Paper Series 057, United Nations University, Maastricht Economic and social Research and training centre on Innovation and Technology (2009)

- [50]. Francisca, M. B. and Suzzane, N. Cory. "The Locational Determinants of US Foreign Direct Investment in the European Union", *Journal of Financial and Strategic Division*, Vol. 9, Issue.2, pp 43-53 (1996)
- [51]. Galan, J. I. and Benito, G. "Determinants factors of foreign direct investment: some empirical evidence", *European Business Review*, vol. 13, issue 5, pp. 269–278 (2001)
- [52]. Galego, Vieira, C. and Vieira, I. "The CEEC as FDI attractors: a menace to the EU periphery?" *Emerging Markets Finance and Trade* vol.40, issue 5, pp. 74–91 (2004)
- [53]. Garvin, M. and Bosso, D. "Assessing the effectiveness of infrastructure Public- Private Partnership Programmes and Projects", *Public Works Management & Policy*, Sage Journals, vol. 13, no. 2, pp. 162-178 (2008)
- [54]. Globerman, S., Shapiro, D. and Tang, Y. "Foreign Direct Investment in Emerging and Transition European Economies", *International Finance Review*, vol 6, pp.431-459 (2006)
- [55]. Grubert, H. and Mutti, J "Taxes, Tariffs and Transfer Pricings in Multinational Corporate Decision Making", *The Review of Economics and Statistics*, vol. 73, no. 2, pp. 285-293 (1991)
- [56]. Guisinger, S. "From OLI to OLMA: Incorporating Higher Levels of Environmental and Structural Complexity into the Eclectic Paradigm", *International Journal of Economics of Business*, vol. 8, issue.2, pp. 257-272 (2001)
- [57]. Haddad and Harrison, "Are there positive spillovers from Direct Foreign Investment? Evidence from Panel Data for Morocco", *Journal of Development Economics*, vol:42, issue 1, pp. 51-74, (1993)
- [58]. Hakkala, N. K., Norback, P. J. and Svaleryd, H. "Asymmetric Effects of Corruption on FDI: Evidence from Swedish Multinational Firms", *The Review of Economics and Statistics*, vol. 90, issue. 4, pp. 627-642 (2008)
- [59]. Hakro, A. N. and Ghumro, A. A. "Foreign Direct Investment, Determinants And Policy analysis: A Case Study of Pakistan", retrieved from website "[http://www.gla.ac.uk/media/media\\_21789\\_en.pdf](http://www.gla.ac.uk/media/media_21789_en.pdf)" on 16 August, 2009
- [60]. Harral, C., Jit Sondhi and Guang Zhe Chen, "Highway and Railway Development in India and China, 1992-2002", *Transport Notes*, World Bank: Washington, DC, May, 2006



- [61]. Harris, C "Private Participation in Infrastructure in Developing Countries: Trends, Impacts and Policy Lessons", World Bank, Working Paper No. 5, Washington D.C (2003)
- [62]. Helliener, G "Transnational Corporations and Direct Foreign Investment", in Chenery, H and Srinivasan, T (eds) Handbook of Development Economics, II, pp.1442-1479. (1988)
- [63]. Hines, J. "Forbidden Payment: Foreign Bribery and American Business After 1977" NBER, Working Papers: No. 5266, (1995)
- [64]. Holburn, G.L.F and Zelner, B.A "Policy Risk, Political Capabilities and International Investment Strategy: Evidence From The Global Power Industry", Haynes Prize for Best Paper at the Academy of International Business (2008)
- [65]. Holburn, G.L.F " Regulatory Institutions and Firm Strategy: Theory and Evidence From the Electric Power Industry ", Doctoral Dissertation, University of California, Berkeley University (2001)
- [66]. Hymer, S. "The International Operations of National Firms", Boston: MIT Press (1976)
- [67]. Hymer, S. "The International Operations of National Firms", Phd Dissertation, MIT, USA (1960)
- [68]. IMF "Regional Economic Outlook: Asia and Pacific," International Monetary Fund, May, Washington.D.C (2006)
- [69]. IMF " India: Selected Issues", International Monetary Fund, Washington D.C Journal of Development Economics, vol. 70, pp. 443-447 (2005)
- [70]. Investment Commission, India retrieved from web address [www.investmentcommission.com](http://www.investmentcommission.com)
- [71]. Jensen, O. and Brude, F. B. "The Institutional Determinants of Private Sector Participation in the Water and Sanitation Sector in Developing Countries", 4th Conference on Applied Infrastructure Research, Berlin, 8 October (2005)
- [72]. Jessica and Singh " Moving India: Policies and Priorities in Transport Sector Reforms" retrieved from website [http://scidnew.stanford.edu/system/files/shared/Wallack-Singh\\_9-14-09.pdf](http://scidnew.stanford.edu/system/files/shared/Wallack-Singh_9-14-09.pdf) on 20 August 2009
- [73]. JSA, Proceedings of the Conference on India infrastructure Regulatory and Institutional Issues, organized by SAFIR, New Delhi (2009)

- [74]. Kahn, M. and Y.H. Kim "Foreign Direct Investment in Pakistan: Policy Issues and Operational Implications," ERCD Report Series No. 66, ADB, Manila (1999)
- [75]. Kim, J and Mahalingam, A. "Private Risk in Infrastructure", *Transnational Dispute Management*, vol 4, issue. 2, April (2007)
- [76]. Kirkpatrick, C, Parker, D and Zhang, Y "Foreign Direct Investment in Infrastructure in Developing Countries: Does Regulation Make A Difference?" Presented at the Asian Development Bank Institute (ADB) Annual Conference on 'Infrastructure and Development: Poverty, Regulation and Private Sector Development', Tokyo, 6th December (2004)
- [77]. Knack, S and Keefer, P. "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures", *Economics and Politics*, vol. 7, issue 3, pp. 207-228 (1995)
- [78]. Kral, P. "Identification and Measurement of Relationships Concerning Inflow of FDI: The Case of the Czech Republic," Working Papers 2004/05, Czech National Bank, (2004)
- [79]. Kumar, N. "Infrastructure Availability, Foreign Direct Investment Inflows and Their Export Orientation: A Cross Country Study Exploration," RIS Discussion Paper, No.26, (2002)
- [80]. Kumar, A., Gray, R. D., Hoshkote, M., Klaudy, S., and Ruster, J. (1997), *Mobilizing Domestic Capital Markets for Infrastructure Financing-International Experiences and Lessons for China*, World Bank Working Discussion Paper # 377, The World Bank, Washington, D.C. (1997)
- [81]. Kwang and Singh, "The Determinants of Foreign Direct Investment: New Empirical Evidence", *Transnational Corporations*, vol 5, issue 2, pp. 67-105 (1997)
- [82]. Lamech, R and Saeed, K. "What International Investors Look for When Investing in Developing Countries: Results from a Survey of International Investors in the Power Sector" *Energy and Mining Sector Board Discussion Paper N0. 6*, World Bank, Washington D.C (2003)
- [83]. Levitt, R and Mahalingam, A. "Institutional Theory as a Framework for Analyzing Conflicts on Global Projects", *ASCE Journal of Construction Engineering and Management*, vol. 133, issue. 7, pp 517-528 (2007)

- [84]. Li and Rugman, "Real options and theory of foreign direct investment", *International Business Review*, vol.16, issue 6, pp.687-712, ( 2007)
- [85]. Li, Huizhong, Huang, Ping and Li, Jialun, *China's FDI Net Inflow and Deterioration of Terms of Trade: Paradox and Explanation*. *China & World Economy*, vol. 15, issue. 1, pp. 87-95,(2007)
- [86]. Lim, E. G. "Determinants of, and the Relation Between, Foreign Direct Investment and Growth: A Summary of Recent Literature" IMF Working Paper (WP/01/175) Washington (2001)
- [87]. Loree, D. & Guisinger, S. (1955) "Policy and Non-policy Determinants of US Equity Foreign Direct Investment," *Journal of Business Studies*, vol. 26, issue 2, pp. 281-299 (1995)
- [88]. Lucas, R 'On the Determinants of Direct Foreign Investment: Evidence from East and Southeast Asia', *World Development*, vol.21, issue 3, pp.391-406 (1993)
- [89]. Liu, Z "Foreign Direct Investment and Technology Spillovers: Evidence From China" *Journal of Comparative Economics*, vol. 30, issue 3, pp. 579-602 (2002)
- [90]. Luna, A. N and Woodhouse "The IPP Investment Experience in Argentina", Working Paper 44, PESD, Center for Environmental Science and Policy (2005)
- [91]. Lynne, R "ForeignDirect Investment in Mexico and Chile: A Critical Appraisal" in "Foreign Direct Investment in Latin America: Its Changing Nature at the Turn of the Century" Werner Baer and William R. Miles (ed), pp. 55-82 (1991)
- [92]. Maniam & and Chatterjee, A "The determinants of US Foreign Direct Investment to India" *Journal of Managerial Finance*, vol. 24, issue 7, pp. 53-62 (1998)
- [93]. Mathur, M. P. "Finances and Functioning of Urban Local Bodies : A Situation Analysis", *India Infrastructure Report 2001, Issues in Regulation and Market Structure*, 3iNetwork, Oxford University Press, New Delhi, (2000)
- [94]. Mauro, P. "Corruption and Growth", *Quarterly Journal of Economics*, vol. 110, issue 3, pp. 681-707 (1995)

- [95]. Mellahi C. Guermat and H. Bortmani "Motives for FDI in Gulf Co-operation Council State : The Case of Oman", Thunderbird International Business Review, vol. 45, issue 4, pp. 431-446 (2003)
- [96]. Ministry of Railways, Railway Budget, (2006, 2007 & 2008)
- [97]. Ministry of Power, India, 2007,  
[http://powermin.nic.in/generation/cea\\_month.htm](http://powermin.nic.in/generation/cea_month.htm)
- [98]. Mody, A. "Infrastructure strategies in east Asia," World Bank, Washington D.C. (1997)
- [99]. Monsalve, C "Private Participation in Transport: Lessons From Recent Experience in Europe and Central Asia", PPIAF Publication, June (2009)
- [100]. Data accessed from Ministry of Statistics and Programme – [www.mospi.nic.in](http://www.mospi.nic.in), Gol, 2008
- [101]. Mudami, R. S. "Privatization and Globalization: The Changing role of State in Business" Edward Elgar Publishing Limited, (2002)
- [102]. Mundell, Robert A. "International Trade and Factor Mobility", American Economic Review, June, and in Mundell, Robert A., International Economics, MacMillan (1957)
- [103]. Munnell, A.H. "Why has productivity growth declined? productivity and public investment," New England Economic Review, January/Feb, pp. 2-22 (1990)
- [104]. Nakamura, S. and Oyama, T. "The Determinants of Foreign Direct investment from Japan and the United States to East Asian Countries, and the Linkage between FDI and Trade", Research and Statistics Department, Bank of Japan, Working Paper 98-11, (1998).
- [105]. Nonnemberg, M. B and Jorge Cardoso de Mendonça "The Determinants Of Foreign Direct Investment In Developing Countries," Anais do XXXII Encontro Nacional de Economia [Proceedings of the 32th Brazilian Economics Meeting] 061, ANPEC and Mendonca (2004)
- [106]. North, D. C. "Institutions, Institutional Change and Economic Performance," Cambridge: Cambridge University Press, (1990)
- [107]. Orr, R. "The Legacy and Lessons of Distressed and Failed Infrastructure Projects in the 1990s- Introduction to the Special Issue", Transnational Dispute Management, vol.4, issue 2, April (2007)

- [108]. Pargal, S. "Regulation and Private Sector Investment in Infrastructure: Evidence from Latin America", World Bank Corporate Secretariat Policy Support Division, Washington D.C. (2003)
- [109]. Patibandla, "Patterns of Foreign Direct Investment in developing Economies: A comparative Study of India and China", International Journal of Management and Decision Making, vol. 8, issue. 2-4, pp 356-377 (2007)
- [110]. PFC, Annual Report 2007-08, data retrieved from the website www.pfc.com on 15th September 2009.
- [111]. Pittman, "Chinese Railway Reform and Competition: Lessons from the Experience in Other Countries", Journal of Transport Economics and Policy, vol. 38, issue 2, pp. 309-332 (2004)
- [112]. Planning Commission, Rural Roads Report, India 2008;
- [113]. Portes Richard & Rey, Helene, "The determinants of cross-border equity flows," Journal of International Economics, Elsevier, vol. 65, issue 2, pp 269-296, (2005)
- [114]. Protego " El ROI De La Banca Y De La Iniciativa Privada en El Desarrollo De Proyectos De Energia en Mexico", III Congreso Nacional AMEE, 2000, as quoted in Nunez-Luna (2005)
- [115]. Quazi, R. & Mahmud, M. "Determinants of Foreign Direct Investment in South Asia," The International Journal of Business and Public Administration, vol. 3, issue 1, pp. 1-13 (2007)
- [116]. Quazi, R. "Economic Freedom and Foreign Direct Investment in East Asia," Journal of the Asia Pacific Economy, vol. 12, issue 3, pp. 329-344 (2007)
- [117]. Quere, "How does FDI react to Corporate Taxation" International Tax and Public Finance, vol. 12, issue 5, pp. 583-603 (2005)
- [118]. Quere Bénassy "Institutional determinants of foreign direct investment," The World Economy, vol. 30, no. 5, pp. 764-782, (2007)
- [119]. Quium, A "Meeting the Financing Gap: PPPs in Bangladesh Perspective" Conference on Strengthening Private Sector Participation and Investment in Physical Infrastructure, Tokyo (2007)
- [120]. Raghuram & Gangwar, "Indian Railways in the Past Twenty Years: Issues, Performance and Challenges", IIMA, Working Papers No (2008)

- [121]. Ramamurti and Doh, "Rethinking Foreign Infrastructure Investment in Developing Countries" *Journal of World Business* vol. 39, issue 2, pp. 151-167 (2004)
- [122]. Raubenheimer, J. E. "An item selection procedure to maximize scale reliability and validity" *South African Journal of Industrial Psychology*, vol. 30, issue 4, pp. 59-64 (2004)
- [123]. Rolfe, R. J., Ricks, D. A., Pointer, M. M. and Carthy, M. M "Determinants of FDI Incentive Preferences of MNEs", *Journal of International Business Studies*, vol. 24, issue. 2, pp. 335-355 (1993)
- [124]. Root, F. & Ahmed, A. "Empirical Determinants of Manufacturing Direct Foreign Investment in Developing Countries," *Economic Development and Cultural Change*, vol. 27, issue. 4, pp. 751-767 (1979)
- [125]. Rosenzweig M. B., Pabon-Agudelo, C., Voll, Sarah P. & Neto, Jose Simoes , "Power Sector Reform in Brazil: Challenges to Private Investment", *National Economic Research Associates, Washington DC* (2001)
- [126]. Sader, F. "Attracting foreign direct investment into infrastructure: why is it so difficult?" *Foreign Investment Advisory Service, FIAS, Occasional Paper no. 12. Washington, D.C* ( 2000)
- [127]. Sahoo, P. "Foreign Direct Investment in South Asia: Trends Impacts and Determinants", *ADB Discussion Paper No. 56* (2006)
- [128]. Sahoo D. and M. Mathai "Economic Growth in India: Does Foreign Direct Investment Inflow Matter?" *The Singapore Economic Review*, Vol. 48, issue. 2, pp.151-171(2003)
- [129]. Saskia, K. S., Wilhelm Morgan Stanley, Dean Witter "Foreign Direct Investment and Its Determinants in Emerging Economies" *African Economic Policy Paper, Discussion Paper No. 9* (1998)
- [130]. Thomas, A. V., Satyanarayana N. Kalidindi, K. Ananthanarayanan, "Risk Perception Analysis of BOT Road Project Participants in India, *Journal of Construction Management and Economics*," vol 21, issue. 4, pp 393-407 (2003)
- [131]. Sayek, S. "FDI and Inflation: Theory and Evidence", *Duke University, Kent* (1999)

- [132]. Scaparlanda, A. & Mauer, L. (1969) "The Determinants of US Direct Investment in the EEC," *American Economic Review*, vol. 59, issue 4, pp. 558-568 (1969)
- [133]. Schneider, F. & Frey, B. "Economic and Political Determinants of Foreign Direct Investment," *World Development*, vol. 13(2), p. 161-175, (1985)
- [134]. Sharma and Vohra, "Foreign Direct Investment in the Electricity Sector: The Indian Perspective ", *The Electricity Journal*, vol. 21, issue. 07, pp. 63-79 (2008)
- [135]. Singh, Anoop "Policy Environment and Regulatory Reforms for Private and Foreign Investment in Developing Countries: A Case of the Indian Power Sector" Discussion paper No.64, ADB (2007)
- [136]. Singh, H. and Jun, K. W "Some New Evidence on Determinants of Foreign Direct Investment in Developing Countries", *Policy Research, Working Paper no. 1531*, (1995)
- [137]. Singh, Anoop "Power Sector Reform in India: Current Issues and Prospects", *Energy Policy*, vol.34, issue.16, pp. 2480–2490 (2006)
- [138]. Singhal, K. "Emerging Opportunities in Infrastructure", *Conference on Special Economic Zones: Policy, Issues, Needs & Opportunities*, New Delhi, July 25-26, 2007
- [139]. Sinha, Swapna.S "Comparative Analysis of FDI in China and India: Can Laggards Learn from Leaders", *Universal Publishers* (2008)
- [140]. Smarzynska, B. and S. Wei, S. "Corruption and Composition of Foreign Direct Investment: Firm-Level Evidence" *NBER Working Papers*, No. 7969, (2000).
- [141]. Stern Jon & Cubbin, John "Regulatory effectiveness : the impact of regulation and regulatory governance arrangements on electricity industry outcomes," *Policy Research Working Paper Series 3536*, The World Bank, (2005)
- [142]. Subramaniam, P "Infrastructure: Sacred journeys", *Express Hospitality*, E-Article retrieved from web address <http://www.expresshospitality.com/20091015/hospitalitylife03.shtml> on December 23, 2009

- [143]. Sun, Q., Tong, W., & Yu, Q. "Determinants of foreign direct investment across China" *Journal of International Money and Finance*, vol. 21, issue 1, pp. 79-113 (2002)
- [144]. Swaan. W "Knowledge, Transaction Costs and the Creation of Markets in Post- Socialist Economics" in P.G. Hare and J.R. Davis, (eds) *Transition to the Market Economy*, Vol. II (Routledge: London) (1997)
- [145]. Tam, L. M. "Reforming Vietnam's Banking System: Learning from Singapore's Model" , ISEAS Working Paper, Visiting Researchers Series No. 5 (2000)
- [146]. Thomsen, S. "Investment Patterns in a Long Term Perspective", Working Papers on International Investment, OECD (2007)
- [147]. The Economist "India on Fire," New Delhi Feb 1, 2007
- [148]. Trevino, J. Len and Mixon, F. G "Strategic Factors Affecting Foreign Direct Investment Decisions by Multi-National Enterprises in Latin America", *Journal of World Business*, vol. 39, issue 3, pp. 233-243, (2004)
- [149]. Tseng, W. and Zebregs, H. "Foreign Direct Investment in China: Some Lessons For Other Countries", in Wanda Tseng and Markus Rodlauer (eds), *China: Competing in The Global Economy*, IMF, pp. 68-88 (2002)
- [150]. UNCTAD, *World Investment Report*, Geneva, (2008)
- [151]. United Nations "Foreign Direct Investment in Africa: Performance and Potential", New York, United Nations Publications (1999)
- [152]. Vernon, Raymond "International Investment and International Trade in the Product Cycle", *The Quarterly Journal of Economics*, vol.80, issue 2, pp.190-207 (1966)
- [153]. Vial, J "Foreign Investment in the Andean Countries", CID Working Paper No.85 (2002)
- [154]. Vincenzo and Scuderi "On the Influence of Foreign Direct Investment on Economic Growth: Evidence from Italian regions" retrieved from website <http://www.wbiconpro.com/Jacono-Scuderi.pdf> on 18 September 2009
- [155]. Walker, D. A. "A Confirmatory Factor Analysis of the Attitudes Toward Research Scale" Paper presented at the annual meeting of the MWERA Annual Meeting, Westin Great Southern Hotel, Columbus (2008)
- [156]. Wei, S.J. "How Taxing is Corruption on International Investors?" *Review of Economics and Statistics*, vol. 82, issue1, pp. 1-11 (2000)



- [157]. Wei, Y. and X. Liu, "Foreign Direct Investment in China: Determinants and Impacts", Edward Elgar, Cheltenham, U.K (2001)
- [158]. Wells, T. Jr. and Wint, A.G. (1990), "Marketing a country: promotion as a tool for attracting foreign investment", Occasional Paper 1, International Finance Corporation, Washington, D C. (1990)
- [159]. Wheeler, D., and A. Mody "International Investment Location Decisions: The Case of U.S Firms", *Journal of International Economics*, vol. 33, issue 1-2, pp. 57-76, (1992)
- [160]. Wilkinson. Steven I. "The politics of infrastructural spending in India," Department of Political Science, University of Chicago, Chicago (2006)
- [161]. Willhams and Mullen "Foreign Direct Investment and Regional Productivity Spillovers in US Manufacturing" *Review of Urban and Regional Development Studies*, vol.19, issue 3, pp. 185-196 (2008)
- [162]. Williamson, O. E. "The Economic Institutions of Capitalism", Free Press, New York (1985)
- [163]. Wint , A.G and Williams, D. "Attracting FDI to developing countries: a changing role for government", *International Journal of Public Sector Management*, vol. 15, issue 5, pp.361-74. (2002)
- [164]. Winters, L. Alan and Yusuf, S. "Dancing with Giants: China, India, and the Global Economy", World Bank, Washington D.C 2007; [278]
- [165]. Woodhouse Erik J. "The Experience of Independent Power Producers in Developing Countries", Final Report, Program on Energy and Sustainable Development, Center for Environmental Science and Policy, Stanford University, Stanford, CA. (2005)
- [166]. Woodward, D.P. and Rolfe, R.J. "The Location of Export-Oriented Foreign Direct Investment in the Caribbean Basin", *Journal of International Business Studies*, Palgrave Macmillan Journals, vol. 24, issue 1, pp. 121-144 (1993)
- [167]. World Bank "Private participation in infrastructure: trends in developing countries, 1990 – 2001," World Bank and Public Private Infrastructure Advisory Facility, Washington D.C (2003)
- [168]. World Bank, *World Development Indicators* (CD-Rom), Washington, DC (2006).

- [169]. Zaheer, S. "India power sector: challenges and investment opportunities," paper presented at Plenary Session IV: Financing Options, New Delhi, (2006)
- [170]. Zeng J. & Bigsten, A. & Hu, A. "Can China's Growth be Sustained? A Productivity Perspective," World Development, Elsevier, vol. 37, issue 4, pp. 874-888 (2009)
- [171]. Zhang, Q., & Felmingham, B. "The relationship between inward direct foreign investment and China's provincial export trade" China Economic Review, vol.12, issue 1, pp. 82-99 (2001)



<b>Annexure 1: Details of Indian Companies in Road Sector with Foreign Participation</b>		
<b>Indian Company</b>	<b>Foreign Collaborator</b>	<b>Country</b>
Maytas infrastructure, Hyderabad,	Macquarie, bank	Australia
Maytas infrastructure, Hyderabad	Rorippa Investment LDC	Bahamas
Maytas infrastructure, Hyderabad	Fortis B Fund Equity Asia	Belgium
Maytas infrastructure, Hyderabad	Pyramis Global Advisors ltd	Canada
M/S gangavarm Port ltd, Hyderabad	Danspar Limited	Cyprus
Maytas infrastructure, Hyderabad	Sampo Fund Management Ltd.	Finland
Maytas infrastructure, Hyderabad	SG Option Europe	France
Maytas infrastructure, Hyderabad	BNP Paribas Arbitrage	France
Maytas infrastructure, Hyderabad	American International Assurance	Hong Kong
Maytas infrastructure, Hyderabad	Lehman Brothers Asia Ltd	Hong Kong
Maytas infrastructure, Hyderabad	ABN Amro Asia Ltd	Hong Kong
Maytas infrastructure, Hyderabad	Atlantis Opportunities Fund	Ireland
Punj Lloyd Ltd PLN Construction Ltd	Morgan stanley Mauritius India Co Ltd	Indonesia
Punj Lloyd Ltd	Macquarie, bank	Indonesia
Punj Lloyd Ltd	Citigroup Global Markets India Mauritius	Indonesia
Maytas infrastructure, Hyderabad	Russel Investment Co PLC The Pacific	Ireland
Maytas infrastructure, Hyderabad	AIG Global Investment	Ireland
Maytas infrastructure, Hyderabad	Pacific Basin Equity	Ireland
Maytas infrastructure, Hyderabad	Pacific Basin Ex Japan Equity Fund	Ireland
Maytas infrastructure, Hyderabad	AIG Global Investment Corp. Asia	Ireland
Maytas infrastructure, Hyderabad	AIG Global Investment Corp. Singapore	Ireland
Maytas infrastructure, Hyderabad	The Master Trust bank of Japan Ltd.	Japan
Maytas infrastructure, Hyderabad	Schroder Dynamic asia Equity Mother Fund	South Korea

Maytas infrastructure, Hyderabad	Fortis Banque Luxemboug SA AC Fortisl Fund	Luxembourg
Maytas infrastructure, Hyderabad	Scandinaviska Enskilda Banken Ab (Publ)	Luxembourg
Maytas infrastructure, Hyderabad	Fidelity Funds Emerging Markets Fund	Luxembourg
Maytas infrastructure, Hyderabad	Merril Lynch Intl. Investment Fund	Luxembourg
Maytas infrastructure, Hyderabad	ICICI Intl. Ltd	Mauritius
Maytas infrastructure, Hyderabad	Taib Securities Mauritius Ltd	Mauritius
Punj Lloyd Ltd, New Delhi	Rhodes Diversified Level 3	Mauritius
Maytas infrastructure, Hyderabad	india Max Investment fund Ltd	Mauritius
Maytas infrastructure, Hyderabad	Winstar (I) Investment Co Ltd	Mauritius
Maytas infrastructure, Hyderabad	Listed Investment Ltd	Mauritius
Maytas infrastructure, Hyderabad	ING Bank NV Singapore Branch	Netherlands
Maytas infrastructure, Hyderabad	Stichting MM Emerging Markets Fund RE SC	Netherlands
MFAR Holdings Pvt	Individual Dr. Mohamed Ali	Oman
M/S Trichy Tollway Pvt. Ltd Hyderabad	IJM Trichy (Mauritius) Ltd IJM Corporation Berhad	Mauritius
Shipco Infrastructure Pvt Ltd.	Bros Investment Ltd	Mauritius
Maytas infrastructure, Hyderabad	Kotak Mahindra (UK) Ltd	Mauritius
Maytas infrastructure, Hyderabad	Matterhorn Ventures	Mauritius
Maytas infrastructure, Hyderabad	India Emerging Opportunities Fund Ltd	Mauritius
Maytas infrastructure, Hyderabad	Goldmansachs Investment Ltd	Mauritius
Maytas infrastructure, Hyderabad	CLSA Mauritius Ltd	Mauritius
Maytas infrastructure, Hyderabad	Premier Investment Fund Ltd	Mauritius
Maytas infrastructure, Hyderabad	Mavi Investment Fund Ltd	Mauritius
Maytas infrastructure, Hyderabad	UBS Securities Asia Ltd	Mauritius
Maytas infrastructure, Hyderabad	Peninsular South Asia Investment Co. Ltd	Mauritius
Maytas infrastructure, Hyderabad	Seaheaven Investments Mauritius Ltd	Mauritius
Maytas infrastructure, Hyderabad	KII Ltd	Mauritius

Maytas infrastructure, Hyderabad	Lotus Global Investments Ltd.	Mauritius
Maytas infrastructure, Hyderabad	Invesco Asset Management Asia Ltd	Mauritius
Maytas infrastructure, Hyderabad	PCA India Infrastructure Equity Open Ltd	Mauritius
Maytas infrastructure, Hyderabad	International Opportunities Portfolio MA	Mauritius
Maytas infrastructure, Hyderabad	Marshal Asia Capital Ltd	Mauritius
Trendset Bharat Project Developers Pvt Ltd.	Bharat One Project P. Ltd	Mauritius
Maytas infrastructure, Hyderabad	Cophall Mauritius Investment Ltd	Mauritius
Maytas infrastructure, Hyderabad	Blue Bay Mauritius Investment Ltd	Mauritius
Maytas infrastructure, Hyderabad	Tricolor (I) Opportunities Fund	Mauritius
Maytas infrastructure, Hyderabad	NOTZ STUCKI ET	Mauritius
Maytas infrastructure, Hyderabad	Lehman Brothers Asia Ltd	Mauritius
Maytas infrastructure, Hyderabad	Deutsche Securities Mauritius Ltd	Mauritius
Maytas infrastructure, Hyderabad	barclays Capital Mauritius Ltd	Mauritius
Maytas infrastructure, Hyderabad	Argonaut Ventures	Mauritius
Maytas infrastructure, Hyderabad	Minivet Ltd.	Mauritius
Maytas infrastructure, Hyderabad	HSBC Global Investments Fund	Mauritius
Maytas infrastructure, Hyderabad	Lionhart Investments Ltd	Mauritius
Maytas infrastructure, Hyderabad	Sofaer Global Research HK Ltd	Mauritius
Maytas infrastructure, Hyderabad	Amam Ltd	Mauritius
Maytas infrastructure, Hyderabad	Sophi Growth A Share Class of Smoerest	Mauritius
Maytas infrastructure, Hyderabad	Placerings Fonden Handelsbanken Indien	Sweden
Maytas infrastructure, Hyderabad	Rahn and Bodmer	Switzerland
Maytas infrastructure, Hyderabad	Global Investment House Co.	U.A.E

Maytas infrastructure, Hyderabad	SHUAA Capital PSC	U.A.E
Maytas infrastructure, Hyderabad	Emirates Financial Services PSC	U.A.E
Maytas infrastructure, Hyderabad	Commerz Bank South East Asia LTD.	U.K
Maytas infrastructure, Hyderabad	Societe Generale	U.K
Maytas infrastructure, Hyderabad	KBC Financial Products UK Ltd	U.K
Maytas infrastructure, Hyderabad	The Rolls Royce Pension Fund	U.K
Maytas infrastructure, Hyderabad	The Variable Annuity Life Insurance Company	U.S.A
Maytas infrastructure, Hyderabad	TCW Asset Management Company	U.S.A
Nagarjuna Construction Company	Annuity BOT	Domestic
Navyuga Engineering Company Ltd	Annuity BOT	Domestic
Soma Enterprise Ltd	Annuity BOT	Domestic
Intertoll- Delhi-Noida Toll Bridge	BOOT	South Africa
GMR & United Engineers (Malaysia) Berhad ,Andhra Pradesh	Annuity BOT	Malaysia
Apollo Enterprises Ltd	Annuity BOT	U.K
John Laing International Ltd	Annuity BOT	U.K
Abhijeet Group	NA	Domestic
Aryan Toll Road Company	NA	Domestic
Atlanta Limited	NA	NA
ATR Infrastructure	NA	NA
B.E. Billimoria & Co. Ltd.	NA	NA
Chetak Enterprises Pvt. Ltd.	NA	Domestic
Delhi Brass & Metal Works (DBMW)	NA	NA
DS Constructions Ltd and its associates	Toll BOT	Indian
IVRCL Ltd.	Toll BOT	Indian
Noida Toll Bridge Corporation Ltd	Toll BOT	Indian

## Annexure 2: Companies In Power Sector In India With Foreign Participation

Indian Company	Foreign Collaborator Name	Country
Ad Hydro Power Ltd	International Finance Corporation	U.S.A
Adani Power Ltd, Ahmedabad	31 Power Investments A1 Ltd	Mauritius
Alstom Power Conversion India Pvt. Ltd., Chennai	Alstom Power Conversion Holding	France
Ambuthirtha Power Pvt Ltd, Bangalore	India Clean Energy Ltd	Mauritius
Auro Mira Energy Company Private Limited,	Baring (I) Private Equity Fund Ii Ltd	Mauritius
Bhoruka Power Corporation	Damf li Hydro Power Holdings	Cyprus
Canasia Power Services Pvt Ltd, New Delhi	Canasia Power Corporation Canada	Canada
Datagen Power Systems Private Ltd	Firblog Holdings Co	U.S.A
Dodson Lindblom Hydro Power Pvt Ltd, Mumbai	Dodson Lindblom Hydro Power Pvt Ltd	Mauritius
Enrcon Wind Farms (Hindustan	Enercon Gmbh	Germany
Esco Couplings & Transmission Pvt Ltd	Efeco N. V. Sa	Belgium
Essar Power (Orissa) Ltd	Essar Power Holdings Ltd	Mauritius
Gaps Power & Infrastructure Pvt. Ltd	Hampton Investment Group Ltd	U.K
Gati Infrastructure Ltd	Ras Ltd	Mauritius
Gati Infrastructure Ltd, Hyderabad	River Valley Hydro Ventures Pte Ltd	Singapore
Gautami Power Ltd Spv Of Maytas	Iemcee Infra (Mauritius) Ltd	Mauritius
Gautami Power Ltd , Subsidiary Of Maytas Infrastructure	Lim Corporation Berhad	Malaysia
Gautami Power Ltd, Chennai	Transoceanic Projects Limited	Mauritius
Generation Eolica India Pvt	Generation Eolica India Pvt	Spain
Gmr Power Corporation	Odean Ltd	Seychelles
Gvk Power (Krishnapatnam) Pvt Ltd	Ranger Investments Ltd	Mauritius

Gvk Power And Infrastructure Ltd, New Delhi	Transoceanic Projects Limited	Mauritius
Hassan Biomass Power Company Pvt Ltd	Nucon Energy Group	Mauritius
Inabensa Bharat Pvt Ltd, New Delhi	Instalaciones Inabensasa	Spain
India Energy Pvt Ltd, Chennai	San Aps	Denmark
Jsw Powers Ltd, Mumbai	Hexagram Investment Pvt Ltd	Mauritius
Kolta Hydropower Ltd, Chandigarh Kolta Hydropower Ltd., B-37, Sector – 1, Noida	Stanplast Ltd	Mauritius
Kvk Bioenergy Private Ltd, Hyderabad	Infomile International Fzc	U.A.E
Lanco Amarkantak Power P. Ltd	Deg Deutsche Investition & En	Germany
Lanco Amarkantak Power P. Ltd	Island Power Ventures Ltd	Mauritius
Lanco Amarkantak Power P. Ltd	Third Millenium Investment Limited	Mauritius
Lanco Amarkantak Power P. Ltd	Century Investment Limited	Mauritius
Lanco Amarkantak Power P. Ltd	International Finance Corporation	U.S.A
Lanco Hydro Power Ventures P. Ltd	Goldstone Solutions Ltd	Mauritius
M/S Himagiri Hydro Energy Pvt. Ltd Sikkim	Ag Visions Limited	Mauritius
M/S Kvk Energy & Infrastructure Pvt Ltd, Kochi	Oldlane Mauritius li Ltd	Mauritius
M/S Rithwik Energy Generation P. Ltd	Glory Corporation Ltd	Mauritius
Marudhar Power P. Ltd, Hyderabad Spv Of Ksk Energy Venture	Lb (I) Holdings Mauritius li Ltd	Mauritius
Monnet Power Ltd, Bhopal	Citicorporation International Finance Corporation	U.S.A
Netpro Renewable Energy (India) Pvt Ltd	Dasa Ag	Switzerland
Patikari Power Private Ltd, New Delhi	Athena Projects Pte Ltd	Singapore
Patkari Power Private Ltd, New Delhi	Image Securities (Fzc)	U.A.E
Reliance Utilities Ltd, Mumbai	Bio Metrix Marketing P. Ltd	Singapore
Rkm Power Gen Ltd, Chennai	Mudajaya Corporation	Malaysia



Samalpatti Power Co Pvt Ltd, Chennai	Wart Sila India Power Investments Limited	Cayman Island
Spectrum Power Generation Ltd	Pinnacle Overseas Assets Ltd	British Virginia
Srs Energy P. Ltd	Mambo Overseas Ltd	Nevis
Sterlite Energy Ltd, Mumbai	Twinstar International Ltd	Mauritius
Suryachackra Power Corporation Ltd, Hyderabad	Caterpillar Power Ventures International	Mauritius
Suzlon Generators Pvt Ltd	Elin Ebg Motoren Gmbh	Austria
Tata Power Company Ltd	Gof Asian Growth & Income	Canada
Tata Power Company Ltd, Mumbai Tata Power Trading Company Limited	Ga Fund Luxembourg	Luxembourg
Tata Power Company Pvt Ltd, Mumbai	Swiss Finance Corporation, Mauritius Ltd	Mauritius
Teesta Urja Ltd, New Delhi Himalayan Green Energy Pvt. Ltd. –New Delhi	Athena Projects Pte Ltd	Singapore
Theolia Wind Power P Ltd, New Delhi	Natwal Energy Corporation Gmbh	Germany
Torrent Power Services Pvt Ltd	Siemensag	Germany
U.S.G Energy P. Limited	Jeyom Segaram	Australia
Wardha Power Company Ltd, Hyderabad SPV of KSK Energy Ventures	KSK Energy Ltd	Mauritius

## QUESTIONNAIRE

### THIS SURVEY IS A PART OF THE PHD RESEARCH AT IIT ROORKEE

The questionnaire has 9 sections and is designed to consider your outlook towards the various factors and policies affecting the investment prospects in the infrastructure sector in India. The aim is to identify the deterrents and main drivers of foreign investment in infrastructure sector (Roads, Power and Railways) in India.

All information that is obtained from the survey will be treated in complete confidentiality, and used only for the academic research objective. If you have any queries pertaining to the questionnaire, please do not hesitate to contact Ms. Ekta Vohra at [ekfasddm@iitr.ernet.in](mailto:ekfasddm@iitr.ernet.in), [consultantektasingh@gmail.com](mailto:consultantektasingh@gmail.com)

#### A. Information about Respondent

Name: \_\_\_\_\_

Phone No.: \_\_\_\_\_ Sex: Male/Female \_\_\_\_\_

E-mail: \_\_\_\_\_ Age: \_\_\_\_\_ Years \_\_\_\_\_

Designation: \_\_\_\_\_ Work experience: \_\_\_\_\_ Years \_\_\_\_\_

Professional Qualification: \_\_\_\_\_

#### PART A: This part focuses to identify the main drivers of investment

	What do you think is the major reason for any foreign company to <i>invest</i> in the infrastructure sector in India? Rank in the order of priority. (1-8)
A1.	Market factors
A2.	Macro-economic stability
A3.	Favourable Business environment
A4.	Corruption free environment
A5.	Overall investment climate is investor friendly
A6.	Effective Institutional framework in the sector
A7.	Efficient risk- coverage mechanism
A8.	Financial Institutions Stability/ Financial market enablers

**PART B: Following part focuses to identify the variables/factors responsible for either encouraging or discouraging investment in the infrastructure sector in India**

**Macroeconomic and Market Environment** - The section is designed to capture the effect of various macroeconomic and market factors on the flow of FDI in the infrastructure projects in India. The main factors considered are- Inflation, exchange rate, GDP, GDP growth rate, public debt, ROI, purchasing power parity etc.

Sl. No	Macroeconomic and Market Environment (MME)	Do you agree with the statement				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	The <b>macroeconomic stability</b> of any country bears a positive relationship with the amount of FDI in the infrastructure sector in that country.					
2.	The high variability (fluctuations) in <b>inflation</b> , as prevalent in India has a negative effect on FDI in the infrastructure sector (as it distorts the informational content of relative prices and indicates about macroeconomic instability).					
3.	Heavy <b>Government debt</b> as seen in the case of India acts as a deterrent in attracting FDI to the infrastructure sector.					
4.	<b>High variability rate</b> in the value of <b>host country's currency</b> discourages FDI in the infrastructure projects, due to foreign exchange risk.					
5.	This is true in case of India too.					
6.	<b>Market size</b> (measured in terms of real GDP) is an important determinant for FDI in infrastructure sector in India.					
7.	The consistency in the <b>growth rate</b> (measured by the GDP growth rate) is an important indicator of the future market growth and hence a precursor to higher levels of FDI in a country like India.					

8.	<b>Return On Investment</b> (measured by GDP per capita) is an effective measure of profitability and important for leveraging FDI in infrastructure sector					
9.	<b>Very low per capita GDP</b> in India will have a deterrent effect in attracting FDI in infrastructure sector.					
10.	<b>Purchasing Power Parity</b> may play a crucial role in attracting FDI in country like India, if highlighted in the right perspective by the Government.					

**Business Environment** – The purpose of this section is to assess India's business enabling environment for FDI firms in the infrastructure sector. It aims at examining the quality and capacity of Government agencies in interacting with the foreign firms in case of infrastructure projects

Sl. No	Business Environment	Do you agree with the statement				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	<b>Time and cost input of management</b> in co-ordinating with the Government offices is high and acts as the major business constraint, leading to "loss of foreign investors' confidence.					
2.	<b>Number of procedures /approval</b> required before starting a infrastructure project in India are too many and too complex to be perceived by any foreign entity and act as an effective deterrent towards investment in this sector.					
3.	Process of <b>financial closure</b> is too long in India and is one of the factor responsible for cost escalation in the infrastructure projects, which has a negative effect on the foreign firm's investment decision.					

4.	Most of the infrastructure projects fall within the preview of more than one <b>State Government</b> with an involvement of <b>Central Government agencies</b> in some or the other form.					
5.	This involvement as stated in question no. 4 leads to the multiple and conflicting roles of different <b>Government agencies</b> and eventually has an adverse impact on investment decision of the foreign firm.					
6.	The major implementation problems are encountered at the <b>state level</b> , as project implementation takes place at the State level. This particular aspect undermines the FDI promotion efforts of the Government.					
7.	The <b>attitude of Government officials</b> in India towards foreign entities is quite lackadaisical (inefficient and cumbersome bureaucracies).					
8.	Existence of different <b>political parties at the Centre and State</b> results in different priorities, regarding the location of the infrastructure projects. This renders project unviable and/or delays its implementation causing frustration to the foreign investor.					
9.	The overall investment climate in India is "investor friendly" and conducive for carrying out business.					
10.	What do you think is the most difficult thing, a foreign firm faces while <b>interacting with the Government offices</b> in India? Rank in the order of priority. (1-5)					
	a. <b>Lack of corporate governance</b>					
	b. <b>Lack of transparency</b>					
	c. <b>Lack of participation</b>					
	d. <b>Lack of accountability</b>					
	e. <b>Lack of right skills and capacity</b>					

**Corruption Environment-** The section aims to assess the extent of corruption prevalent in the Indian working environment.

Sl. No	Corruption Environment	Do you agree with the statement				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	Corruption in India is perceived as one of the major investment constraints in Infrastructure projects, as these projects involve multiple agencies and interaction with these <b>Government agencies</b> is quite frequent.					
2.	There is a clear divide in <b>North versus South</b> perception of "work-friendly" environment.					
3.	South Indian States have <b>clean working conditions</b> as compared to, many of the otherwise "resourceful and facilities starving", North Indian States. This is one strong reason for more foreign investment pouring in infrastructure projects in southern region of the country.					

4.	Which of the following <b>forms of corruption</b> is more pervasive in India? Rank in the order of priority. (1-3)	
	a. <b>Bribery</b>	
	b. <b>Extortion money</b>	
	c. <b>Fraud</b>	

5	During which of the following <b>stages</b> you feel corruption is most prevalent in the Infrastructure projects in India? Rank in the order of priority. (1-3)	
	a. <b>Pre-qualification and tender</b>	
	b. <b>Project execution</b>	
	c. <b>Dispute resolution</b>	

**Investment Environment** – The purpose of this section is to assess the overall effectiveness of the investment environment as existing in India, in creating impact on the FDI investment decisions in the infrastructure sector. Various factors as examined are Investment promotion institutions, labour policies, taxes, existing infrastructure facilities, incentives etc.

Sl. No	Investment Environment	Do you agree with the statement				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	The present <b>investment scenario</b> in the country is quite "investor-friendly" for FDI in the infrastructure sector.					
2.	<b>The Investment commission and Foreign Investment Promotion board</b> are affective in building the brand image of the country (India) for infrastructure investment.					
3.	Increase in <b>domestic credit</b> to the local infrastructure firms enhances the confidence of foreign investors in this sector and as such leave a positive impact on the investment decisions of the foreign firms.					
4.	<b>Labour laws, rules, regulations</b> and procedures are too complex and difficult to be followed especially by foreign investors, which discourage the investment from this source.					
5.	The existence of <b>double-taxation avoidance treaty</b> between host and home country plays important role in attracting FDI in infrastructure sector in India (India has DTAA, Double Taxation Avoidance Agreement with 69 countries).					
6.	The ease of <b>conversion or transfer of currency</b> in India is a favourable feature towards attracting FDI in infrastructure sector as revenues generated are in local currency.					
7.	In case of projects implemented via Special Purpose Vehicle, <b>dividends</b> are being taxed twice first at the level of the project-specific SPVs and then at the holding company level. This factor discouraging foreign investors.					
8.	<b>Global sourcing</b> (as prevalent in India) for the procurement of capital and revenue inputs enhances the attractiveness of					

	the infrastructure projects for FDI					
9.	For implementing any infrastructure project, the <b>existing supporting infrastructure</b> (communication, transportation and accessibility to resources) is important factor to decide upon the foreign investment in this sector. In India the existing supporting infrastructure is very poor.					
10.	<b>Policy incentives</b> play important role in attracting FDI to the Infrastructure projects					
11.	Increase in the <b>Government spending</b> on infrastructure development increases the future prospects of FDI in the sector in any economy.					
12.	Decrease in <b>Government spending</b> in the infrastructure segment in India has negative effect on FDI flow to the sector.					
13.	Identifying and nurturing long-term relationship with competent and trustworthy <b>domestic partner</b> is quite difficult in case of joint ventures in India.					
14.	Which of the following <b>incentives</b> is more lucrative in terms of increasing project worth, towards FDI in the infrastructure sector? Rank in the order of priority (1-5)					
	a. <b>Concessions and taxes-holiday</b>					
	b. <b>Tax reduction/</b> deviation from standard					
	c. <b>Loans, grants, subsidised loan</b>					
	d. <b>Exemptions</b> from import duties on capital equipments					
	e. <b>Viability Gap Funding (VGF)</b> scheme in case of socially justifiable but not commercially viable project in near future					



15.	Lack of which of the following <b>infrastructure facilities</b> in India, has significant deterrent effect on the investor's decision pertaining to investment in the infrastructure project? Rank in the order of priority. (1-5)
	a. <b>Efficient road connectivity</b>
	b. <b>Rail-road connectivity</b>
	c. <b>Connectivity to sources of fuel</b> (coal mines/gas) location (in case of thermal power plants)
	d. <b>Telecommunication</b>
	e. <b>Water availability</b>

**Institution and regulatory environment-** In this section the quality of the existing institutional, regulatory and legal framework in the Indian infrastructure sector is assessed. The main aim is to identify the existing bottlenecks in the system which are discouraging FDI in the sector in the country.

Sl. No	Institution and Regulatory Environment	Do you agree with the statement				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	FDI in the infrastructure sector is sensitive to the quality of the <b>institutional and regulatory set-up</b> in any country					
2.	Transparent and <b>independent regulatory institutions</b> in the individual sector encourage the foreign investment in that sector in any country					
3.	The <b>regulatory regime</b> (in power sector) in India is very stable and regulatory authorities /institutions work in an autonomous manner (without any political control and influence)					
4.	Having single <b>regulatory authority</b> for the entire country, as against the present practice of Central and State regulatory institutions (as in case of power sector), will definitely enhance the future investment prospects in the sector in India.					
5.	The absence of <b>regulatory body</b> for Road sector in India, discourages investment in sector.					

6.	Preparation of <b>standard documents</b> such as Model Concession Agreement (highways), Pre-bid qualification methodology and procurement process (power sector) are effective in encouraging FDI in the infrastructure sector in India					
7.	The institutional framework as discussed in these standard documents is effective in making the <b>competition</b> fair and transparent					
8.	Recovery of <b>user-charges</b> is one of the biggest hurdles in making any infrastructure project viable.					
9.	Institutional framework in India provides effective security mechanism for the recovery of <b>user-charges</b> in infrastructure projects.					
10.	Approvals/ clearances required to reach <b>financial closure</b> in infrastructure projects are very cumbersome and require interaction with number of Government offices, giving rise to red-tapism.					
11.	Institution of <b>Shell companies/SPVs</b> (that takes care of mandatory clearances and approval, as done recently in case of Ultra-Mega Power projects) will to an extent remove the ills associated with red-tapism and eventually enhance foreign investment in India.					
12.	Effective <b>rule of Law</b> (reliable and stable legal institutions), is an important factor in India, responsible for attracting FDI in the infrastructure sector					
13.	<b>Easy accessibility</b> of the <b>judicial system</b> by any and every interest group deters FDI in the sector in India (as compared to China).					

14.	Making the <b>projects tradable/freely transferable</b> (allowing the project developer to exit, at any stage), would increase the likelihood of the FDI in the sector in India.					
15.	The laws governing various infrastructure sectors in India do not permit the participation of the project developers in the <b>tariff-determination</b> , which discourages the FDI in the sector, in the country.					
16.	Institutional framework, in infrastructure projects in India, is effective and avoids all possible <b>conflict</b> between stakeholders					
17.	In event of disputes-arising, the <b>conflict-resolution mechanism</b> is effective in India					
18.	The risk allocation mechanism, as provided in the <b>standard project documents</b> –MCA (model concession agreement in case of roads), PPA (power purchase agreement in case of power sector) is effective in India.					
19.	Association of the <b>multilateral agencies</b> in the infrastructure projects in developing countries in one way or the other facilitates FDI.					
20.	Association of <b>multi-lateral agencies</b> in the infrastructure projects in India is quite prevalent, which facilitates the FDI in the sector.					

**Risk-related variables** – The section aims to identify the major risks associated with the infrastructure projects in India, which deters FDI in the sector.

1.	Which of the following <b>types of risk</b> have greater implication on FDI in the infrastructure projects in India? Rank in the order of priority. (1-6)	
	a. <b>Political risk</b>	
	b. <b>Commercial risk</b>	
	c. <b>Legal risk</b>	

	d. <b>Developmental risk</b>	
	e. <b>Construction completion risk</b>	
	f. <b>Operating risk</b>	
2.	In your opinion which of the following risks a foreign firm would hedge before making investment in the infrastructure sector in India. Please tick in the appropriate box/boxes.	
	a. <b>Political risk</b>	
	b. <b>Commercial risk</b>	
	c. <b>Legal risk</b>	
	d. <b>Developmental risk</b>	
	e. <b>Construction completion risk</b>	
	f. <b>Operating risk</b>	
3.	Provided below is a list of possible <b>political risks</b> associated with any infrastructure project. Which of the following is the most deterrent factor for foreign investment in the infrastructure project in case of India? Rank in the order of priority. (1-7)	
	a. <b>Sovereign risk</b> - risk arising from the host government's breach or repudiation of a contract, non performance or other actions or inactions by a sub national host Government and/or contractual counterparties	
	b. <b>Policy risk</b> – changes in infrastructure policy priority, Government yielding to pressures from interest groups opposing to infrastructure development, price setting policy	
	c. <b>Taxation risk</b> - consistency and fairness of tax system.	
	d. <b>Expropriation /Nationalization risk</b> - acts of the host government that may reduce or eliminate ownership of, control over, or rights to the private assets	
	e. <b>Forced buy-out risk</b>	
	f. <b>Cancellation of concession risk</b>	
	g. <b>War and civil disturbance</b> - risk of damage to, or the destruction or disappearance of, assets caused by politically motivated acts of war or civil disturbance in the host country	
4.	Which of the following <b>commercial risks</b> is the most deterrent factor for foreign investment in the infrastructure project in case of India? Rank in the order of priority. (1-6)	
	a. <b>Inflation risk</b> - high variability in the inflation rate leading to cost-escalation	
	b. <b>Foreign exchange risk- Devaluation risk</b> - the risk of losses due to unfavourable movements of the exchange rate (such as the impact of a local currency devaluation on projects earning revenues in local currency but paying expenses and debt service in foreign currency)	
	c. <b>Interest rate risk</b>	

	d. <b>Currency inconvertibility risk</b> - risk arising from an inability to convert local currency into foreign exchange or to transfer funds outside the host country	
	e. <b>Customer base and prospects forecasting risk</b>	
	f. <b>Technological risk</b> – early obsolescence due to technological	
5.	Which of the following <b>legal risks</b> is the most deterrent factor for foreign investment in the infrastructure project in case of India? Rank in the order of priority. (1-3)	
	a. <b>Changes in Laws and regulations</b>	
	b. <b>Law enforcement risk</b>	
	c. <b>Dispute redressal risk</b>	
6.	Which of the following <b>development risks</b> is the most deterrent factor for foreign investment in the infrastructure project in case of India? Rank in the order of priority.(1-4)	
	a. <b>Subsequent approval risks</b>	
	b. <b>Environmental clearance risk</b>	
	c. <b>Land acquisition risk</b>	
	d. <b>Rehabilitation risk</b>	
7.	Which of the following <b>operating risks</b> is the most deterrent factor for foreign investment in the infrastructure project in case of India? Rank in the order of priority. (1-5)	
	a. <b>Associated infrastructure risk</b> (for e.g fuel supply risk in case of thermal power plant)	
	b. <b>Demand risk</b>	
	c. <b>Cost-escalation risk</b>	
	d. <b>Management risk</b>	
	e. <b>Force-majeure risk</b>	

Sl. No	Risk Environment	Do you agree with the statement				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
8..	The perception of <b>industry-related risk</b> measured by the volatility of their stock market prices relative to world stock market prices influence international investment strategies in a particular industry.					

9..	The industries pertaining to the infrastructure sector in India, are also prone to this kind of risk.					
10.	Risk associated with <b>global price volatility</b> (petroleum products and other) influence the investment decision especially in the electricity sector in India					

**Financial Market Environment** – The purpose of the following section is to capture the capacity of domestic capital market in attracting FDI in the infrastructure sector in India

Sl. No	Financial environment	Do you agree with the statement				
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1.	Existence of strong <b>domestic financial (capital) market</b> is important in minimizing risks associated with currency volatility, in case of foreign capital and also to have access to long-term local currency finance in case of infrastructure projects					
2.	Country's <b>credit rating index</b> as measured by certain agencies, affects the FDI decision pertaining to infrastructure sector in that country.					
3.	There is an easy <b>access to local capital market</b> in India and this is an important facilitator of FDI in infrastructure sector in the country.					
4.	Quality of <b>financial regulatory system</b> is good in India and acts as a pull factor for FDI.					
5.	The <b>local-bond market</b> in India is quite developed to facilitate long term financing in local currency.					
6.	The <b>swap-market</b> in India is quite developed, to facilitate long term financing in local currency, at cheaper rates.					

7.	Time and cost required for raising the fund in India is quite high as compared to other economies.					
8.	Allowing the entry of <b>financial investors</b> as equity stakeholders in infrastructure projects, will introduce a longer-term financing element and enhance the FDI prospects.					
9.	Allowing special concessions on <b>external commercial borrowings</b> (in case of infrastructure projects) will have a positive impact on FDI in the infrastructure projects in India.					
10.	a.) Existence of a well developed <b>risk-mitigating instruments/insurance market</b> for infrastructure projects enhances the investment prospects in this sector in any country.					
	b.) In India such kind of insurance market is well developed.					