PhD Thesis

Public Choice in National Highways Financing in India: The Scope for Financial Intermediation in Enhancing Infrastructure Investment

インドにおける国道建設財源の公共選択：インフラ分野への投資拡大の展望

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Submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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WIAPS Waseda University Institute of Asia-Pacific Studies

WASEDA UNIVERSITY
Tokyo, Japan

SEPTEMBER 2010

THE SUMMARY OF DOCTORAL THESIS

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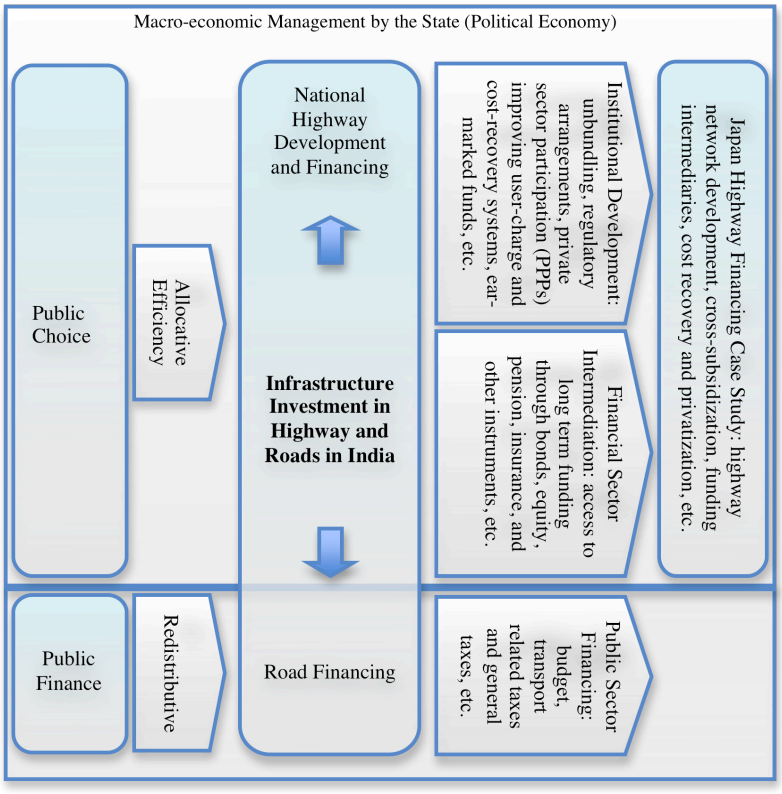
Keywords **Public choice, infrastructure regulation, financial intermediation, Indian national highways financing**

Abstract

The aim of this thesis is to understand India's choices in public financing of infrastructure, using national highways as a case study. Its hypothesis is that, in order for the Indian state to achieve allocative efficiency in National Highway financing, improved financial intermediation is required through a combination of not only new and enhanced institutional and regulatory arrangements, but also financial system reform.

In order to allow improvement in policy choice in efficiently financing highways, especially after the reform period (early 1990's onwards), this study argues that better institutional and regulatory arrangements (through infrastructure unbundling), and intermediation (through an expanding financial system) are indispensable to providing services of general interest (SGI). Public choice theory is used as the framework to understand the economic role of the state in terms of allocative efficiency, redistribution and macro-economic management (refer to the diagram below).

Thesis Structure based on Public Choice Theoretical Framework



Since the late 1980s, India has undergone radical change, with decentralized politics on the one hand, and gradual economic liberalization and deregulation (after decades of financial repression), on the other. Faced with a resource crunch and supply side constraints in infrastructure provision and funding, public choice becomes valuable in elucidating the shifting role of the state in providing essential, monopoly-oriented public goods overlapping the public-private domain.

Network infrastructures, being a particular type of public goods, are extensively used by, and at the same time benefit the users, and as such, in the long term shall be financed as tolled-goods to enhance their efficiency. Such is the case of the highways, in which the service is produced and financed through those who are willing to pay to consume the goods. Although (1) the introduction of market principles, (2) the involvement of long-term financial instruments, and (3) the private sector participation are all important, but they cannot replace the essential role of public spending in meeting the huge initial investments and providing steady flow of funds to highways financing. To complement the above-mentioned processes, financial intermediation through funding instruments (e.g., bonds, securitization, domestic institutional investments, etc.) shall be offered to both public and private sectors.

It is crucial to align the National Highway sector (which comprises 2% of all roads in India but carries 40% of the road traffic) towards efficiency in financing, since the State, District and Village Roads are also competing for public investment. With huge capital requirements in the highway sector (US$ 49 Billion in the next five-year period 2007 – 2012), and with growing traffic volume and demand, there is also an immense potential for private investment, financial sector intermediation, and cost-recovery systems (through user charges). The analysis identifies how the Highway Sector, under the flagship of National Highway Authority of India (NHAI, the independent body and regulator since the 1990s) has been implementing a program for financing the construction and management of national highways through direct fuel taxation (cess), promoting private sector participation, and imposing direct user charges (tolling), and awarding more Build-Operate-Transfer (BOT) Toll projects.

The Japanese experience of highway development (and its financing) is used as a case study that provides India with lessons on public financing for highway network expansion. Although Japan through legislations, principles of equal access, various forms of cross-subsidization (including spatial and temporal), and cost-recovery system, succeeded in developing an efficient highway network, it eventually resulted in a huge over-investment, which in turn incurred mounting debts (mainly due to public financial mismanagement). Thus, the case of Japanese highway development is the epitome of public choice in network infrastructure financing.

In regard to Indian National Highway financing, it remains to be seen, whether the National Highway Authority of India succeeds in reducing its dependency on borrowing and fuel taxation. In order to achieve this goal, private sector participation must be improved. This, in turn, is contingent upon the convergence of the following two variables: (1) infrastructure regulation (a shift from public to private domain) and (2) financial intermediation (a shift from bank based short-term orientation to capital market long-term orientation).

Selected References:

Committee on Infrastructure (2006), Planning Commission, *Financing of The National Highway Development Programme*, New Delhi.

World Bank (2004), *India-Financing Highways, Report No. 30363 IN*, Energy and Infrastructure Sector Unit, South Asia Region.

Dedication

To the one who instilled in me the fear of God and the love of knowledge!

For the only one,
who, as far as I can remember,
told me that I will one day be a scientist.
Here I stand now at the edge of that dream.
And it is time to listen to her again!

My Mother

..thanks be to god, who gives us victory through our Lord Jesus Christ..
be steadfast, immovable, always abounding in the Lord's work,
because you know that your labor is not in vain in the Lord.

1 Corinthians 15:57-58

Acknowledgements

Expressing my gratitude to all those who I am indebted to, will only leave me with an endless list.
In order to simplify that process, I am just leaving my thoughts in words and names.

At the end of this ceaseless cycle;
reading, processing, writing, analyzing and rewriting
I feel like I'm standing at the edge of the vast expanse of the universe ahead of me;
overwhelming me.
It's like an ocean, so vast, debilitating, yet inviting.
If I don't plunge into this, I might get lost in this corner again;
I guess it's time to reconnect with society!
I am thankful for all the experiences I had in Japan,
and the people who are imprinted in my memory

I was always brought up to believe in the absolute, as the God that created the universe.
I know there is some truth in that, for if not
I would not be putting myself
through this empty quest for knowledge.
For the more I believe the more I do not know;
but it does not matter as long as I live my life, and realize its purpose through living it!
I thank God for his guidance

They have always been there for me, and I for them.
I hope this work will inspire my kin in their pursuit of knowledge (especially Sumantha)!
Blessed be my Family

I think that we are only independent to the point that we are dependent.
This work would not have taken its shape without their constructive guidance:
Prof. Abe, Prof. Kobayashi, Prof Daimon, and Prof Kitamura (GSAPS, Waseda University)

For those who walked the walk with me, I express my sincere gratitude to all my mentors:
Dr Anbumozhi (ADBI, Japan) and Dr Tsuchiya
and advisors:
Prof. Kalirajan (GRIPS, Japan), Dr Rajaraman (Finance Commission, India)

I thank those who morally supported me in innumerable ways, in getting this on the shelf:
Maria, Sashko, Thomas, Andy, Juita, Yuko, Abe Zemi and all my other trusted friends

I am grateful for all the institutional support I received from:
Mombukogakusho, Waseda University, Padeco, Wakeijuku, and NIPFP
and the 1000s of minutes I spent pondering in:
Zoca and Waseda Café

Table of Contents

LIST OF ABBREVIATIONS

AMA	Advanced Measurement Approach
ATIS/V	Advanced Traveler Information Systems
AAI	Airport Authority of India
ABS	Asset-Backed Securities
AoP	Association Of Persons
BJP	Bharatiya Janata Party
BFS	Board for Financial Supervision
BSE	Bombay Stock Exchange
BOT	Build-Operate and Transfer
CCI	Cabinet Committee on Infrastructure
CRAR	Capital To Risk-Weighted Assets Ratio
CRR	Cash Reserve Ratio
CJHPCC	Central Japan Highway Company
CCIL	Clearing Corporation of India Ltd.
CBLO	Collateralized Borrowing And Lending Obligation
CDO	Collateralized Debt Obligations
CLO	Collateralized Loan Obligations
CoI	Committee on Infrastructure
CII	Confederation of Indian Industry
CC	Construction Contract
CCI	Controller of Capital Issues
CRA	Credit Rating Agencies
CRF	Cess Revenue Fund
DVP	Delivery *Versus* Payment
DCFO	Design, Construction, Financing and Operation
DFIs	Development Finance Institutions
EME	Earth Moving Equipment
EJHPCC	East Japan Highway Company
EIU	Economic Intelligence Unit
ERGS	Electronic Route Guidance System
ETC	Electronic Toll Collection
EEA	Emerging East Asian
EPF	Employees Provident Fund
EPC	Engineering, Procurement, Construction
ECB	External Commercial Borrowings
FTC	Fast Track Committee
FIS	Finance-Investment-Saving
FLM	Financial Liberalization Model
FILP	Fiscal Investment and Loan Program
FRBM	Fiscal Responsibility and Budget Management

FIMMDA	Fixed Income Money Market And Derivatives Association
FCI	Food Corporation of India
FDI	Foreign Direct Investment
FII	Foreign Institutional Invertors
FIILA	Foreign Investment Implementation Authority
FILP	Fiscal Investment and Loan Program
FIPB	Foreign Investment Promotion Board
FIPC	Foreign Investment Promotion Council
FYP	Five-Year Plan
GIC	General Insurance Corporation
GQ	Golden Quadrilateral
GOI	Government Of India
GS	Government Securities
GDP	Gross Domestic Product
HEC	Hanshin Expressway Company
HCM	Heavy Construction Machinery
HSD	High-Speed Diesel
HSHC	Honshu-Shikoku Highway Company
ICICI	Industrial Credit And Investment Corporation Of India Ltd
IDBI	Industrial Development Bank Of India Ltd
IDFC	Infrastructure Development Finance Company
ITS	Intelligent Transport Systems
IMF	International Monetary Fund
IPE	International political economy
JEHDR	Japan Expressway Holding and Debt Repayment
JEHDRO	Japan Expressway Holding and Debt Repayment Organization
JHPC	Japan Highway Public Corporation
JICA	Japan International Cooperation Agency
JNR	Japan National Railways
LDCs	Less Developed Countries
LIC	Life Insurance Corporation
LCV	Light Commercial Vehicle
LGV	Light Goods Vehicle
LMV)	Light Motor Vehicle
LFT	Loanable Funds Theory
MDR	Major District Roads
MEC	Metropolitan Expressway Company
MoRTH	Ministry of Roads, Transport and Highways
MoRD	Ministry of Rural Development
MoST	Ministry of Shipping and Transport
MOSRT&H	Ministry of Shipping, Roads, Transport and Highways
MCA	Model Concession Agreement

MBS	Mortgage-Backed Securities
MAV	Multi Axle Vehicle
NCDP	National Comprehensive Development Plan
NH	National Highway
NHDP	National Highway Development Program
NHAI	National Highways Authority of India
NRDS	National Railways Development Scheme
NSDL	National Securities Depository Ltd
NSSF	National Small Savings Fund
NSE	National Stock Exchange
NDS	Negotiated Dealing System
NDS-OM	Negotiated Dealing System–Order Matching
Net NPA	Net Non-Performing Assets
NPS	New Pension Scheme
NBFC	Non-Banking Financial Companies
NPL	Non-Performing Loans
NRIs	Non-Resident Indians
NSEW	North–South and East–West
O&M	Operation and maintenance
ODR	Other District Roads
OTC	Over-the-Counter
OTCA	Overseas Technical Cooperation Agency
PFRDA	Pension Fund Regulatory And Development Authority
PRC	People's Republic of China
PNGRB	Petroleum and Natural Gas Regulatory Board
PS	Prior avings
PSP	Private Sector Participation
PCA	Prompt Corrective Action
PSU	Public Sector Undertaking
PWD	Public Works Departments
PPPs	Public-Private Partnerships
RBI	Reserve Bank Of India
RMBS	Residential Mortgage-Backed Securities
RoA	Return on Assets
SEBI	Securities and Exchange Board of India
STRIPS	Separate Trading Of Registered Interest And Principal Of Securities
SMHC	Special Measures for Highway Construction
SPV	Special Purpose Vehicle
SH	State Highways
SLR	Statutory Liquidity Ratio
SHCIL	Stock Holding Corporation Of India Ltd

SGL	Subsidiary General Ledger
SCAP	Supreme Commander for the Allied Powers
TAMP	Tariff Authority for Major Ports
TDS	Tax Deduction at Source
TAC	Technical Advisory Committee
TGM	Two-Gap Model
UTI	Unit Trust of India
VICS	Vehicle Information and Communication System
WJHPCC	West Japan Highway Company
WDM	Wholesale Debt Market

LIST OF TABLES

LIST OF FIGURES

LIST OF EQUATIONS

LIST OF APPENDICES

1 Introduction

Since the 1980s India has been on the course of gradual liberalization after decades of financial repression. As the state was slowly shedding its ideological stance, the official rupture only happened in 1991, with the Balance Of Payments (BOP) financial crisis. The 1991 Balance Of Payments (BOP) crisis forced India to procure a $1.8 billion IMF loan and was the turning point of India's economic history. In a way the IMF bailout marked India's inability to contain the system that had striven above all for self-sufficiency through its post-independence socialist policies. The BOP crisis immediately confronted P.V. Narasimha Rao's newly elected Congress government, which came into power in mid-1991 after the assassination of Gandhi. Rao had already appointed a non-political figure, economist Manmohan Singh, as finance minister in a gesture that symbolized Rao's desire to charge forward with economic reform. In response to the crisis, the government immediately introduced stabilization measures to reduce the fiscal deficit. The fiscal tightening and devaluation of the rupee by approximately 25% adequately reduced the current account deficit.

This prompted a multi-faceted economic reform program and gradual financial liberalization that has allowed public choice in providing public goods, and options in financing them other than public finance. This has brought the state challenges and opportunities, where fiscal limitations requires the state to withdraw from services for which it was responsible during the pre-reform period; this included controlling the financial system (financial repression) and providing for infrastructure services. Reform also came with a new blueprint of gradually relieving the state of its stretched functions of being responsible for almost all areas of public life (a relic of Nehruvian socialist ideology). The government had to curb itself through prudential expenditure targets, at the same time setting forth to gain from disinvestment and contracting out public services. As the state withdrew, as the sole provider of some of the public goods, it took up its new role as the regulator of private provision of services that it was no longer efficient in providing. Infrastructure services have elements of natural monopoly, as the service provider can set prices substantially in excess of costs; therefore in theory, states, especially governments in developing countries, have either owned these assets or introduced regulation to varying extents in order to curb abuse of market power. There was also a growing supply-side constraint, in terms of providing for the needs of a growing population (which was also largely impoverished by then) and rapid economic growth.

By shifting its ideology-oriented approach to a norms oriented approach, the State could allow for efficiency and monetary gains through private sector development which would in fact participate in the economy raising productivity and capital accumulation. This process of reform has led to financial liberalization, where savings meet investment opportunities by developing financial markets that improve intermediation efficiency, in effect improving productivity, savings, savings and further investment. Since then there have been a series of reforms in the Banking, Equity, Securities, Insurance, and Pension sub-sectors, and more Bills in each of these sub-sectors are now being passed in the Parliament. While the government is now considering allowing pension funds to invest in long-term infrastructure projects, there are already some foreign pension funds that have showed interest in investing their money here. As important changes have taken place in India's financial sector, reform has transformed India's equity markets more dramatically than its banking system. Trading in the equity market is now done on electronic terminals around the country, and this can be mainly attributed to the rising levels of international capital flows and the importance of international norms in finance. The political will behind these efforts

has been such that the Finance Minister expressed that overall, financial sector reforms are the key to creating a systemic framework for higher growth.

As of late 2006 the Prime Minister, Manmohan Singh, has projected financial sector reform and increase in investment in infrastructure as India's two biggest priorities (*The Economic Times*, October 10, 2006). He further stated that the country is better placed than at any time in the recent past to push for reform in two areas:

- The financial reform to facilitate infrastructure and investment; and
- Fiscal reforms to free resources for public and private investment and increase the efficiency of public spending(IMF 2010, p.6).

He was confident of gathering political support for these twin initiatives, his case being that without a reform in the insurance and banking system the national social and economic objectives cannot be achieved. Infrastructure also requires long-term investment, while the current Indian banking system is essentially short-term oriented. In this context, sustaining high growth rates would depend on huge investments in infrastructure that would require India to mobilize long-term capital more effectively than was currently possible through a short-term oriented debt market. Infrastructure shortage has recently been well acknowledged as one of the most crucial impediments to India's recent rapid growth rates. With the infrastructure being stretched beyond capacity, the government is gearing up to relieve severe supply-side bottlenecks. Recent studies suggest that if infrastructure spending does not reach 9% of GDP (currently 5%) by the fiscal year 2011/12 it will become difficult to maintain growth rates of 9-10%. To avoid this capacity constraint, the Planning Commission estimates that India will need US$475 billion in infrastructure investment over the five-year period 2007-2012, with the Highway Sector demanding US$49 Billion. These ambitious investment targets, apart from adding to the financing woes of the central government, would keep on course if not further the various structural economic reforms being implemented since the 1991 Balance of Payments Crisis.

The infrastructure sector in India, as in most developing countries, was for a long time under the direct purview of the government. These services were being provided directly through budgetary resources as they were considered to be under a condition of natural monopoly. This was based on the dominant idea during that time, that infrastructure provision required huge investments and depended on the existence of economies of scale in production; and due to its monopolistic nature the private sector's involvement was mistrusted as it would only lead to profit maximization (as opposed to social equity). This perception, that competition is inherently infeasible in these sectors, was taken for granted for quite a long time, until government public resources were in danger of being exhausted. This also raised government deficits, and it soon became evident that infrastructure investment was impeding economic growth. But over time the global trend was for the gradual exit of the public sector in directly providing infrastructure services, and the growing recognition that private initiative, disciplined in part by regulatory forces and competitive market forces, often has the upper hand in efficiently delivering infrastructure (Mody, 1996, p. xiii). With this trend there were now more options for the public sector in providing public goods like infrastructure, as they could now be unbundled and regulated to allow the private sector to participate and cover the investment gap. In India the unbundling of generation, transmission and distribution in the electricity sector, and a credible competition policy in the telecom sector, raised efficiency through competition in these sectors.

With a lack of funds, the Indian government has been in the process of implementing a range of changes in ownership, sector structure, and regulatory regimes in establishing long-term contracts between the government and private providers. The government has not only been developing regulatory authorities, financial markets, institutions, and intermediaries, but it has also set up earmarked or assured funds and used debt from international development agencies to allow

investment into the infrastructure sector. These arrangements would set the terms for financing urgently needed infrastructure projects, and especially projects developed under the Build-Operate-Transfer (BOT) scheme and its many variants have been the result. Such contractual arrangements were initially widely used to attract independent power generators, but they are now being used extensively to build roads and increasingly with water projects too. This study will seek to look at the evolving structure in which the national highway is being financed in India, especially under a broader context of reform in the infrastructure and financial sector, which allows for the expedition of investment to meet supply side constraints. This work proposes that the Highway Sector under the flagship of National Highway Authority of India (NHAI) since the 1990s, has been on the course of allocative efficiency in financing the construction and management of national highways through promoting Private Sector Participation (PSP), direct fuel taxation (cess), and imposing a direct user charge (tolling) by increasingly awarding more Build-Operate-Transfer (BOT) Toll projects. But there still remain issues as to what kind of cost-recovery system will evolve, and the nature of the next generation of financial reforms that will offer better financial intermediation in highway financing and Private Sector Participation (PSP).

India, as an emerging economy, has supply-side constraints in infrastructure provision that have been well documented, this was largely due to a deficiency in public finance (ADB 2006; World Bank 2006). Although recent developments suggest that there is consistent political will to unbundle infrastructure and create highway assets, by attracting private sector participation and long term funds. The infrastructure sector urgently needs to implement public sector reforms to address supply-side constraints. Changes in delivery mechanisms, processes, procedures, and institutional structures need to be tailored towards client-focused outcomes and results. Financial sector reform and to increase investment in infrastructure were identified as the two biggest priorities for India by Prime Minister Manmohan Singh in late 2006 (*The Economic Times*, October 10, 2006). Infrastructure development had also been accorded key priority in the 11th Five-Year Plan for the years 2007-2012 and the 12th plan period of 2012-2017, with projected investment requirements of US$500 billion and US$1.5 trillion, respectively, by the Prime Minister's Committee on Infrastructure. These initiatives pale when compared to China spending about 11% of its GDP on infrastructure development, which indicates the scope and extent of scaling up needed in infrastructure development in India to match global standards.

Infrastructure investment in India has been a grave concern, due to the large constraints in public financing. Throughout the post-independence period, investment in infrastructure has hovered between 3-6% and it peaked in 1991, coincidentally the same year as the BOP financial crisis. Since then infrastructure investment declined, only partially recovered to 4.5% in 2003-04, and rose to 6% in 2007-08. However, the surveys conducted during the global financial crisis suggest that the government's target of achieving an infrastructure investment of 9% of GDP would be a challenging task (thefinancialexpress.com Tue, 14 Dec 2010, *accessed the same day*). This only suggests the importance of further infrastructure sector reforms through unbundling and better financial intermediation to channel long-term contractual savings to infrastructure sectors on a much larger scale. India's infrastructure investment as % of GDP has lagged behind China, which has been investing over 10% over the last decade.

National Highways has been an interesting case as it has been the target of the government with highest Public-Private partnerships in India although the scale is small. The comparison between the Indian and Japanese case was primarily chosen as the way in which the political economies of both these countries have differentiated between the national highways and other roads (State-Prefectural/District-Local-Village) is similar. Apart from that, Japan served as a good case study as it was able to develop its national highways and expressways remarkably effectively during the post war period, despite facing issues of excessive cross-subsidization, over-investment in

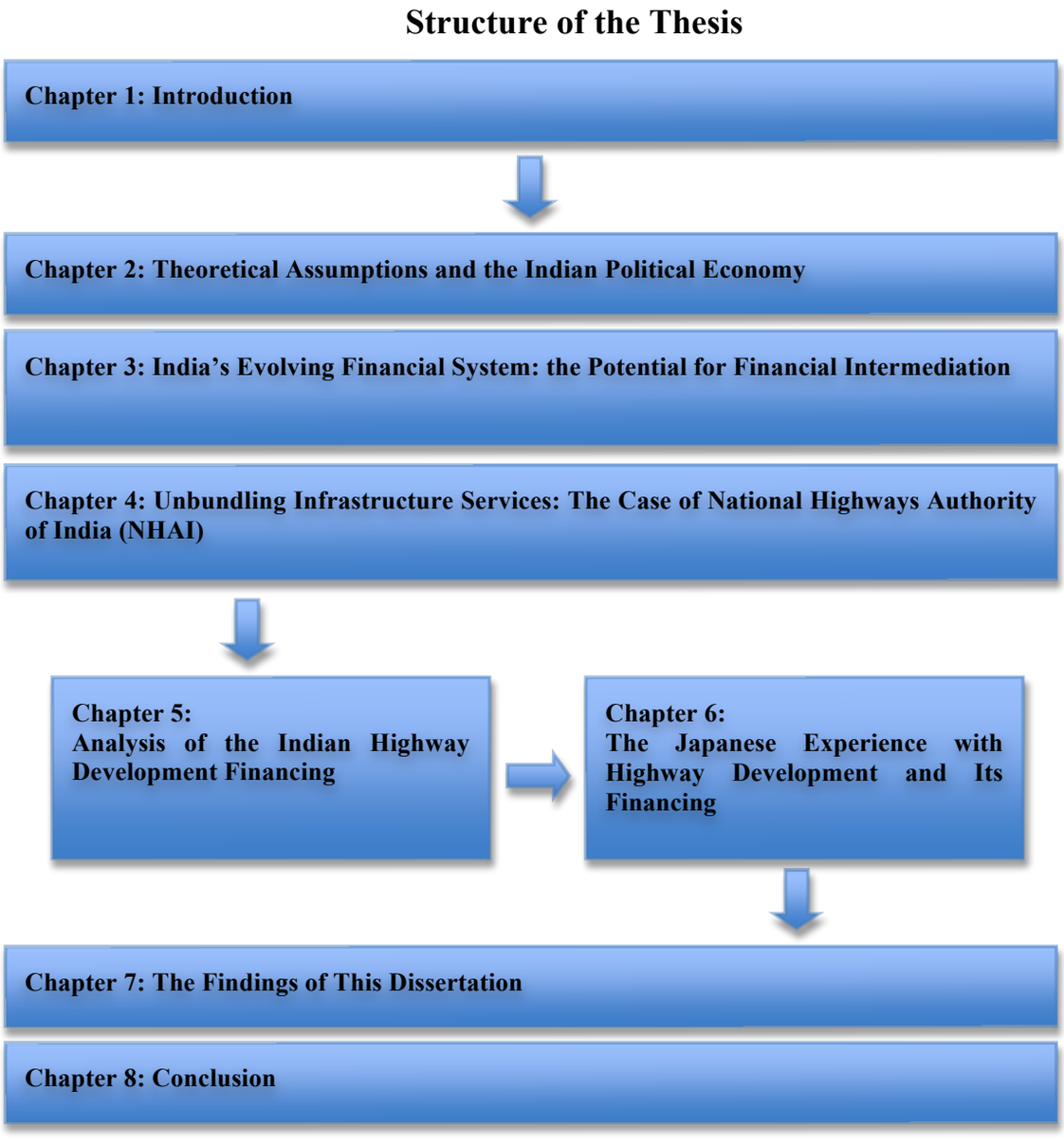
asset creation, and accumulation of debts. The underlying motivation that prompted this research has been the East Asian experience in infrastructure development, and other crucial studies that stressed the role of infrastructure development in economic development (World Bank 1994; Mody 1997; Estache 2006). This academic work identifies the weak link in the way infrastructure and a financial system are related with respect to each other, and seeks to develop an applicable framework.

This study uses public choice theory to achieve allocative efficiency through financial reform and vertical unbundling of infrastructure services. Vertical unbundling arrangements could range from privatization, contracting out, de-nationalization (divestitures), to Private-Public Partnerships (PPP's). In the National Highways case PPP's have been used extensively. While NH only constitutes 2% of the entire road network, it carries around 40% of all traffic, a fact that was largely neglected throughout the Indian post-independence era. On the contrary, due to the prevalence of populist politics, the government of India focused on expanding the rural and other district roads, which grew more than sevenfold between 1941-2001. The importance of developing an arterial highway network was only realized during the 1981-2001 20-Year National Road Plan when national highway construction almost doubled. Especially after the post-1991 reform period, highway investment has been prioritized, and the investment for the current 5-year plan (2007-2008 and 2011-2012) is estimated to be US$45 Billion, of the total US$92 Billion investments required for the entire road and highway sector. Private sector investment is expected to exceed over half the required investments, expected to constitute US$24 Billion of the total US$45 Billion investments in highways.

At the outset, it should be clarified that this thesis will only focus on the Indian National Highway development and achieving efficiency in its financing. It is based on established principles of infrastructure provision and financial intermediation, which will be explained and analyzed in the Indian and Japanese contexts. The result is a trend inference of highway infrastructure development and advancing a simple model to understand the chosen variables (public - private provision in infrastructure and financial sector development) interrelationship. The quantitative data used in this paper is illustrative and deliberately simple. Also, the quantitative exercise will be based entirely on the data for highways (efficiency sector) in India and Japan rather than all roads (equity sector). Ideally, the study should cover public policy issues in fund allocations and institutional development of all road and highways, but the focus on highways is a choice dictated by data availability. This research's narrow focus is on the public choice in highway financing: to use data and simple quantification to review, encompass, and shed new light on, in achieving efficiency in highway funding (that is through private sector participation, user charges, financial intermedation, and so on).

The National Highways is defined through the National Highways Act of 1956, which declares certain stretches of the road network in India as scheduled National Highways. The power to develop these highways rests with the Union. Therefore the central government has the right to acquire land, and charge user fees on these highways. But in principle the government only charges toll on two-lane or multiple-lane highways (in other words tolls are not charged on single lane highways). The divide between central government and state governments also extends to the types of tax collected on vehicles and user charges. While the central government is responsible for taxes relating to vehicle purchase and vehicle use (especially fuel surcharges and taxes) and road-user tolls on national highways, state governments are mostly responsible for taxes on vehicle ownership and vehicle use, and for collecting road-user tolls on state highways when applicable. The National Highways Act of 1956 was amended four times consecutively, most recently in 2002, giving more power to the highway authority to manage the assets, and allowing for private participation and user-charger tolls (http://morth.nic.in/writereaddata/sublinkimages/NH-ACT19568462823618.pdf accessed 15th December, 2010)

Figure 1.1 Structure of the Thesis



While Figure 1.1 above displays the structure of the thesis, Figure 1.2 displays the major themes and the analytical framework used for analysis, and Table 1.1 enumerates the major works and proponents that are used in this work that will be elaborated in the chapters. The thesis aims at understanding the norms and institutional requirements in allowing a country like India to develop two indirect determinants of growth and development: namely the financial sector and infrastructure provision. The study uses the case study of the National Highways development and its financing. In order to understand the nature of institutions and the policy-making environment, Chapter Two discusses the theoretical aspects of Public Choice and the political economy of India, by looking at the opportunities available and constraints in developing intermediaries, regulatory bodies and norms that promote vertical unbundling of infrastructure services. Chapter Three discusses the Financial System, especially in the context of the post-reform period (1991), to

understand the nature of Public finance and the impediments to developing a financial market that intermediate for long term funding, especially for an efficiency sector like the National Highways.

Chapter Four discusses the nature of Infrastructure services and why it would naturally take so long for a country like India, that has to shed its Socialist-style machinery, to find new ways of providing for its citizens, or in this regard users. Chapter Five discusses the way in which India has been financing its National Highways through its National Highway Development Program (NHDP), considering pros and cons and alternatives; it also suggests the option of creating a more liberalized financial system that could provide the long term funds, and a user-charge oriented system to sustain and expand the networks that will be built. Chapter Six presents the Japanese case of National Highway Development, and the principles that guided public undertaking of the Japan Highway Public Corporation. Chapter Seven presents the results of the comparative study by tracing the legislations, principles and institutional development to observe trends in developing highway network infrastructure, using the Indian and Japanese case. Further a model is introduced, deduced from the inter-relationship between infrastructure and financial intermediation that was used to understand the Indian highway infrastructure development and financing. This model attempts to include essential indicators that could be used to profile the direction of infrastructure development demarcating the shift from public to private provision; and assessing the mix of financing instruments used including i) general pool funds from indirect taxes, 2) ear-marked funding from direct taxes, 3) borrowings from international lenders, 3) long-term funds from the financial system, 4) and cost-recovery systems through user-charges.

Figure 1.2 Thematic Diagram of Thesis and Nature of Analysis

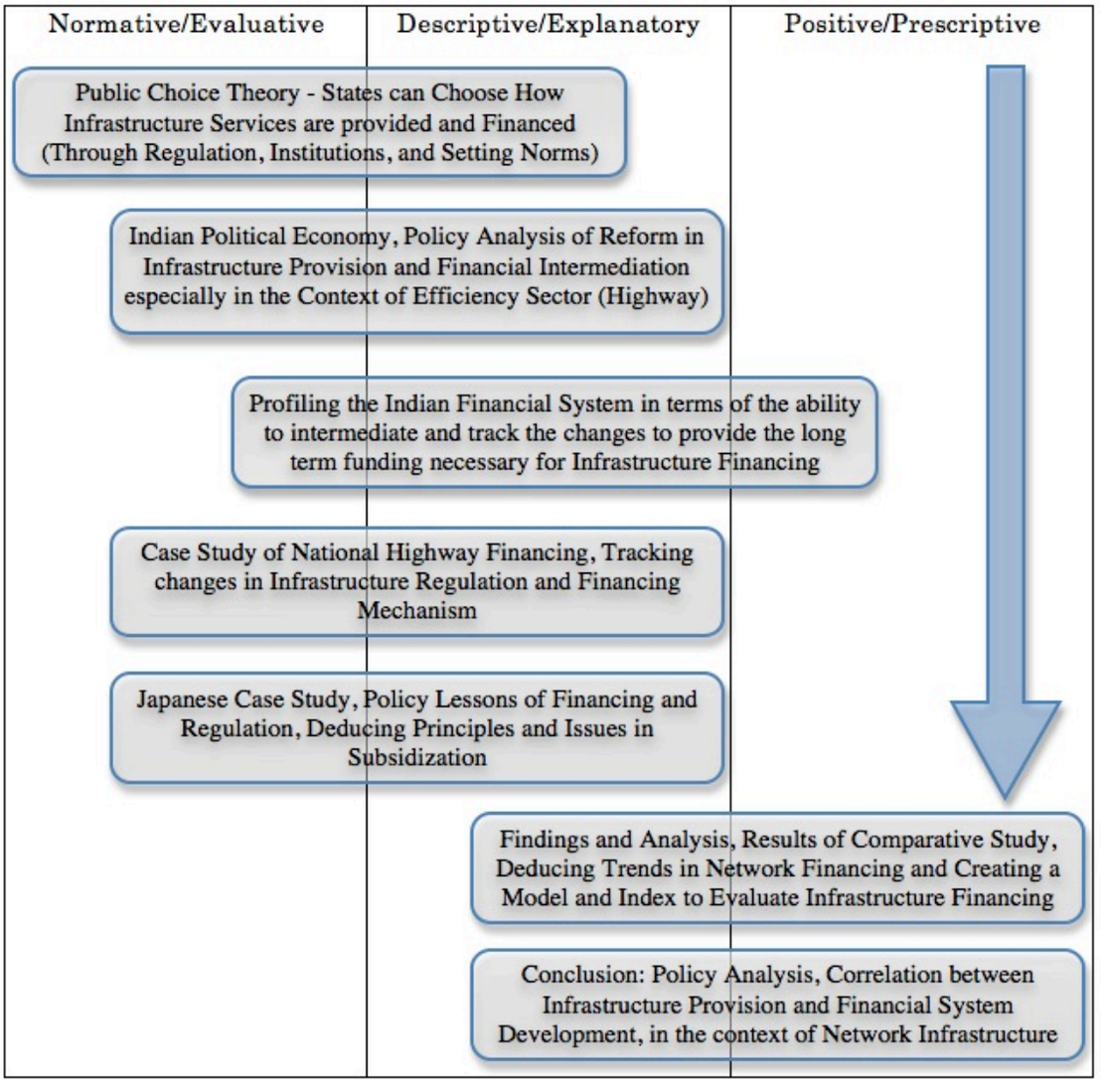


Table 1.1 Major Works and Theories Used in this Study

▼ **Public Choice Theory:**	
	• Public Choice Theory – the growing importance of public choice when states have to make decisions in the providing for their citizens, then being involved intensively and exhausting public finances (Jennings and Mclean 2008 {University of Strathclyde, Glasgow}) Public Choice and Efficiency (McCartney, 2009 {University of London})
	• Economic Constructivism Theory: the growing importance of norms (as opposed to ideologies), institutions, standards, and better information to make decisions (Seabrooke, 2006 and 2008 {Australian National University})
▼ **Indian Political Economy:**	
	• Fiscal Federalism: Constitutional Federal System, Center-State Division of Jurisdiction and Functions (OECD 2008)
	• Political decentralization and Coalition Politics: The emerging new weak minority coalition governance that still is persistent in setting up institutions and norms that are pro-reform (Malik, Kennedy 2009 et al.)
	• Public Sector and Infrastructure Reform has been crucial in promoting efficiency in the way states govern themselves and provide public services, enabling public choice through disinvestment and private sector development and participation (World Bank 2004 {IBRD / World Bank, Washington})
▼ **Financial Reform:**	
	• Indian Financial System Profiling: Profiling of the Indian Financial System: Banking, Securities Sectors, and the scope for capitalizing on the growing domestic savings (ADB 2008, OECD 2007, Shah, 2008 {IIFP})
	• Financial Intermediation theory: Post-Keynesian theory on Financial Intermediation, theoretical framework for developing financial systems (Studart, 2000 {University of London})
▼ **Infrastructure Regulation**	
	• Options in regulation and finance: vertical unbundling, regulatory economics that provides options for choosing the best form of infrastructure provision under a monopoly environment (Gomez-Ibanez 2003 {World Bank})
	• Public Investment in highways: (Mody, 1998{World Bank})
▼ **Japan's Experience with Highway Development and Financing**	
	• Contracting out through JH and eventual Privatization: Social cross-subsidization, pooling system and horizontal unbundling through privatization (Mizutani and Uranishi 2006 and 2008 {Fukuyama Heisei University})
	• Targeted Funding through FILP and User-charge system: Social Costs and Rate of Return (Iwamoto 2002 {Hitotsubashi University}) (Doi and Hoshi 2003 {Keio University and University of California)
▼ **Indian National Highway National Financing:**	
	•Targeted Financing, Fuel Tax, Borrowings and their viability: The need for definition of motives and developing sound financing alternatives through user-charge systems (for cost recovery) and new long-term financing instruments (through intermediaries) (David, 2009 {Waseda University})
	•Concessions and Public-Private Partnerships: The current trends in Private Sector Participation in India, and the trend in PPP's in Indian highway and road sector (Harris and Tadimalla 2003 and 2008 {World Bank})

Hypothesis

In order for the Indian state to achieve allocative efficiency in National Highway financing, a combination of new and improved institutional and regulatory arrangements and financial system reform to improve financial intermediation is required.

Research questions:

- What is the general trend, and in particular how has the Indian state perceived Infrastructure provision, in terms of the public-private, state-market domain?
- How can public choice be used within the Indian political economy to improve allocative efficiency and redistributive functions, and manage and stabilize macro-economic conditions?
- What have the trends been in financing National Highways in India, and why should highway financing achieve more allocative efficiency by improving institutional and regulatory arrangements to improve cost-recovery using user charges, and seek more private financing through the financial system?
- What is the general relationship between infrastructure investment and the financial system, and how could understanding this provide more feasible funding for network infrastructure investments. How can the highway sector with longer gestation periods capitalize on these developments, and what further reforms would improve long term funding?
- Why did India adapt to global trends in infrastructure financing, including the introduction of PPP's, and has the financial system reform (since the BOP financial crisis in 1991) introduced more specialized financial instruments and arrangements that ease long term funding towards infrastructure development?

Research Assumptions:

- Given that use of National Highways is much greater than that of local roads, to accommodate the growing volume of traffic (due to increased economic activity - production/consumption functions, mobility, and vehicle ownership) requires the expansion of highways.
- This calls for large investments in the Highway sector (for the 11th Five-Year Plan is estimated currently at US$55 Billion of the total US$92 Billion for Road and Highways), and a shift from the public to the private sector in the way these services are provided and financed.
- This has essentially occurred due to the constraints in public funding of public goods including infrastructure (where infrastructure investment in India is quite low at 5-6% of GDP). But the ability of the highway sector in attracting the private sector in the development and financing of these services; calls for the Indian state to re-assess the nature of the service and provide for natives in management of these services and funding mechanisms.
- In India this has finally led to the vertical unbundling of highway development and provision, through the establishment of institutions and regulations (to promote concession agreements), special purpose vehicles (SPV's to fund and provide viability gap funding), and allow for public-private partnerships (to allow

private sector developers to provide investment, better quality services and manage the assets). Infrastructure reform has occurred against a backdrop of continuing financial reforms that are leading to the development of markets and instruments that will improve financial intermediation and eventually promote infrastructure investment.

- What is now essential are clear principles and a more integrated approach to highway infrastructure development and management, that that is based on the trends in developing and financing this public asset. Although there is continued political intent in India, to expand the highway network at a faster rate, this study suggests that the incentives for private sector developers (through regulations) to be involved, and providing more alternatives to financing (through better regulated markets and appropriate instruments) should be the direction in which policies can be developed.

2 Theoretical Assumptions and the Indian Political Economy

2.1 Introduction

India, the world's most populous democracy, has attracted a lot recent media attention for its rapid economic growth, and its status as a Newly Industrializing Nation among the developing nations. This trend of economic growth only began some 25 years ago when the Indian economy was able to outgrow the so-called the "Hindu rate of growth" (that is 3%) era, where it has seen growth rate three times as much recently. But the growth that initially brought the fiscal expansion of the 1980s was unsustainable as it eventually led to an Economic Crisis, which was triggered off through a balance of payment problem. These times it was not like the earlier crises that were weathered through short-term borrowing from the international lending agencies coupled with various short-term remedial measures pertaining to the economy. This time substantive reforms were taken on through policy that reflected fundamental changes in the development strategy. Since then significant reforms were put in place, altering domestic investment barriers, foreign trade, financial market development, the private sector, and in infrastructure - unbundling has taken place. These reforms have seen a surge in economic growth and activity, and the potential for further development is still being assessed.

In spite of the political instability that was ushered in by the era of coalition politics, the consensus in economic reforms continue, especially with the Congress party's coalition voted back into power in the recent elections (of 2009). This is a reflection of the mass support to provide continuity to the reforms in progress, in spite of criticisms that the benefits of growth are not being shared equitably across the economy. In the post-1991 period, although both central and state fiscal deficits were brought down significantly in the initial years, they expanded to unacceptably higher levels in the later years. The current state of the finances does not leave much scope for development expenditure. If this situation is to be improved, tax and expenditure reforms, reduction in outright subsidies, and disinvestment in (mostly loss-making) public sector firms cannot be avoided.

This study also assumes that every country is in its own unique stage of development therefore it is imperative that development strategies are prepared by learning from the experiences of other countries, both successes and failures, and by rightly recognizing the country's developmental stage (Kaneko & Metoki, 2008, p. 250). In that regard, this study takes the political economy approach, to understand the various factors that influence the way actors perform their roles, as the variables that affect their actions are innumerable. In the case of India, this study argues that by allowing the efficiency sectors (in the economy) to be contracted out and regulated, the economy has more to gain through the added revenues from user charges and tolled services (for example in telecom), so that it can use its own limited resources in providing other equity oriented services and redistribution. Like the software sector development that has been the leading sector in the private sector development of the Indian economy, only heightens the inequality in the larger context of uneven and combined development. The imperatives of a market-driven global order suggest an open-ended process of development, making some economic and technological convergence realizable but also generating contradictions at various levels is unavoidable (D'Costa, 2003, p. 211).

Apart from understanding the political economic changes occurring as part of the reforms, this work will trace the economic regulations being put in place, of which the two core regulatory tasks of the state is to set, monitor, and enforce the maximum tariffs and of minimum service standards (World Bank, 2006, p. 16). Of the two, control over the maximum prices that enterprises can charge is the more visible and controversial regulatory task. Although tariff levels usually receive the most public attention, they are by no means the only dimensions of economic regulation. Economic regulation may also include controls over tariff structures, quality-of-service standards, and the use of automatic pass-through and adjustment mechanisms, access conditions to networks, entry and exit conditions for participants, and investment obligations relative to existing and new customers. In this regard the options available to the state to regulate public services, including access to infrastructure has been recently generated a lot of literature and public choice effectively provides a framework.

2.2 Theoretical Assumptions: Public Choice and the Non-Market Mechanism

Public Choice literature has expanded since the 1950s to expand from fields close to political science to public finance and the provision of public goods (refer to Table 2.1 for the list of Proponents of Public Choice Theory). Public Choice has been crucial in addressing the questions of goods, financing and the systems of organization within the public domain, as the assumption is that a public good is peculiar as they are non-exclusive. Where contrasting to the private good and the market mechanisms, a public good is when the good is available to a person, it is available to use by all people (Feldman & Serrano, 2006, p. 168). Then the question arises as to how much of the public good should be produced, and what is the people's demand for it, and how it should be provided and financed. It also raises questions as to whether resource allocation should be allocated to the market mechanism or to the non-market collective-decision-making process of a political system. The public choice theory in this context has been crucial to liberate the market-mechanism as an autonomous resource-allocation mechanism, in solving issues of allocation and distribution. This has come to form the core concept of *Public* Choice in contrast to *individual* choice (Kirchner, 2007, p. 21).

The limitation of the economic approach to the concentration of individual choices in markets is limited to just one segment of resource allocation while neglecting resource allocation by non-market mechanisms, for example the state with its voting mechanism and its bureaucratic system. Where economics is concerned with methodological individualism combined with the assumption of scarcity of resources and the assumption or self-interested rational behavior, markets produce prices according to relative scarcity of resources (for both factor and product markets). Apart from these concepts in economics, private property, freedom of contract and a stable currency have been the essential prerequisites for a functioning market. This simple model where distribution is affected by input factors that are remunerated according to their relative scarcity is not applicable in the competing mechanism for allocation and distribution in a non-market-resource-allocation process. Where in a non-market, political-decision-making mechanism of resource allocation of resources, the issues with allocation and distribution can be separated and dealt with differently (Kirchner, 2007, p. 28). In this context Public Choice also expands to provide insight on how different institutional frameworks in political systems are set up and are functioning (positive analysis), and their scope for improvements (normative analysis). According to Kirchner (2007, p. 22), "*Institutions in that context mean rules or set of rules. These rules are not rules of law in the books, but those of law in action*".

Table 2.1 Proponents of Public Choice Theory

Early Predecessors	Thomas Hobbes, Benedict Spinoza, James Madison, Alexis de Tocqueville, Abram Bergson (1938 on Social Welfare Functions), Paul Samuelson (1947), John Stuart Mill (1861), Josef Schumpeter (1942), Knut Wicksell (Wicksell 1896), Howard Bowen, Paul Samuelson, Richard Musgrave
Founding Theoretical Contributions	Duncan Black (1948), Anthony Downs (1957), and James Buchanan (1954 and 1959) and George Tullock (1962), Kenneth J Arrow (1951), Mancur Olson, Jr. (1965), John Rawls's (1971), Richard Abel Musgrave (The Theory of Public Finance 1959), George J. Stigler (1965 The Theory of Price), Gary Becker (1983), Robert D. Tollison (1989), Sam Peltzman (1976), Dennis C. Mueller (Public Choice. 1979) Elinor Ostrom (1990)
Principal Centers of Public Choice Work	• Center for Study of Public Choice, George Mason University: Primarily trained in political science, with the notable exception of Buchanan. Developed a detailed theory of political motivation, mechanisms of collective decision-making, and their potential flaws, while devoting less attention to particular policies that the political process might generate • Economics Department University of Chicago: principally composed of economists, focused on identifying socioeconomic inputs of interests or demands and evaluating the form and impact of government intervention in the economy (outputs), without emphasizing the conversion process by which interest groups obtain the policies they seek • Notable outposts also found at the University of Rochester and Indiana University – Bloomington

Source: Created by the Author from various Sources including

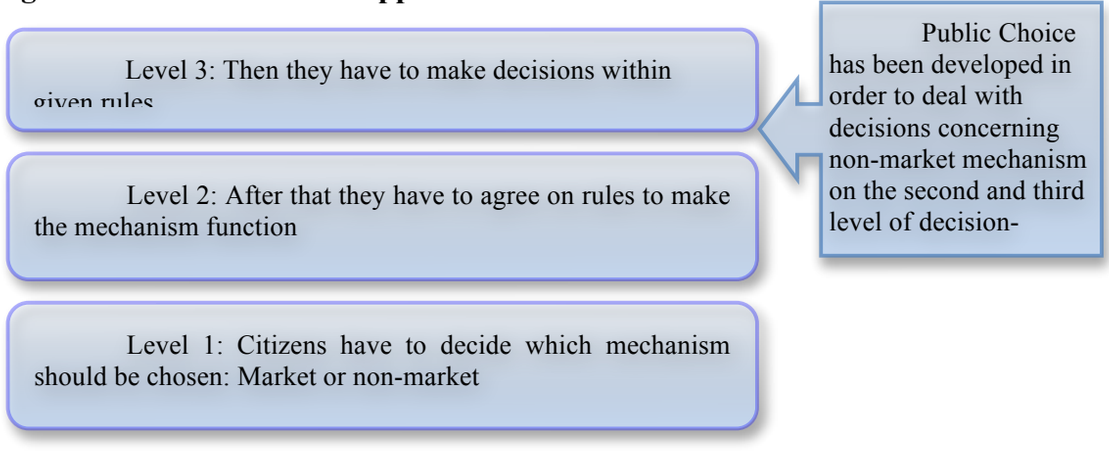
The economic paradigm, which is more a research program than just a methodological approach, is concerned with how individual actors co-ordinate their activities by social interaction, where they pursue their individual goals in a rational, utilitarian manner and deal with the problem of scarcity or resources. When individual actors are confronted with the dilemma of how to allocate resources for the purpose of producing goods, it is usually in line with serving the needs of those, who are allocating the resources. Conversely the question arises as to how distribute the yield of that production. Public Choice assumes that although the methodological individualism solve the initial problem, where the allocation of resources for production of private goods could be left with the market mechanism, when it comes to public goods the market mechanism simply will not work. This is primarily because the nature of public good is in terms of consumption and distribution, where it is not possible to exclude actors from consuming these goods even though they are not willing to participate in the financing of production of these goods. With public goods the market-mechanism supposedly is inferior because it leads to systematic underproduction of such public goods, and therefore the financing of the production of such goods has to be organized through a collective-decision-making process (typical examples are the police, fire service, basic education, and so on). The political decision-making process has been effective here in deciding which resources should be allocated to the production of such public goods, the quality and quantity of the public good and how they should be distributed to those actors, who are participating in financing their production.

This leads to the logical question as to when to apply the market-mechanism of resource allocation and distribution and when to apply the non-market-mechanism. In modern economics the dividing line is the distinction between private and public goods, although there is a difficulty in delineating the difference between public goods and private goods. Toll goods are a good example of how to exclude those who are not

willing to finance the production from consuming the goods, although most collective approach systems would have an alternative open or free access service of lower quality (for example dedicated expressway and alternate general routes). Thus the first decision in any society is to decide which goods should be put into which basket, and this strictly a collective decision and not a market decision (Kirchner, 2007, p. 29). Public Choice in this sense is more than applying the methodology of economics to politics. It seeks to re-define the agenda that begins with the group of individual actors who are making collective decisions on the allocation mechanism that serves their best interests. Public Choice is focusing on the citizen as a decision maker on the allocation mechanism (first decision making level) and decisions within that system (third decision making level). In the political sense public choice is interested in the voting process and rules on voting, as this process determines the principal-agency relation between citizens and political decision makers, the latter ones being agents who pursue their individual interests but under the given control of citizens. In this Public Choice approach prior to citizens making decisions on the allocation mechanism have to decide whether they are in favor of direct or representative democracy.

Understanding representative democracy (as in the case of India too) as a resource allocation mechanism Public Choice-analysis is not interested in the political process as such but in certain functions of that process. Up to now the distinction between two levels of decision-making had been outlined, but there is also a third level that is crucial in the public choice analysis. The process as can be seen in (refer to Figure 2.1), first citizens have to decide which mechanism should be chosen, then they have to agree on rules to make the mechanism function and finally they have to make decisions within given rules. Public Choice has been developed in order to deal with decisions concerning non-market mechanism on the second and third level of decision-making. From this perspective it becomes possible to compare governance structures in the political system, effectively using a normative analysis challenging traditional political science on the old paradigm of the model of the benevolent dictator and of a collectivist approach. Public Choice later has turned to positive analysis as well (p. 31), as this study also seeks to use in understanding public choice in highway financing in India.

Figure 2.1 The Collectivist Approach of Public Choice



Source: Model developed by author based on Kirchner (2007) and Leight (2008)

In his seminal work, Mueller (Mueller, 2003) explains that:

"*Public choice can be defined as the economic study of nonmarket decision-making, or simply the application of economics to political science. The subject matter of public choice is the same as that of political science: the theory of the state, voting rules, voter behavior, party politics, the bureaucracy, and so on. The methodology of*

public choice is that of economics, however. Public choice has developed as a separate field largely since 1948. During the thirties, disenchantment with market processes was widespread, and models of "market socialism" depicting how governments could supplant the price system and allocate goods as efficiently as markets do, if not more so, came into vogue."

He further explains:

"If the state exists in part as a sort of analogue to the market to provide public goods and eliminate externalities, then it must accomplish the same preference revelation task for these public goods as the market achieves for private goods. The public choice approach to nonmarket decision making has been (1) to make the same behavioral assumptions as general economics (rational, utilitarian individuals), (2) often to depict the preference revelation process as analogous to the market (voters engage in exchange, individuals reveal their demand schedules via voting, citizens exit and enter clubs), and (3) to ask the same questions as traditional price theory (Do equilibria exist? Are they stable? Pareto efficient? How are they obtained?). (Mueller, 2003, p. 3)

The essence of this study will in line with Public Choice where normative and positive question will be asked. Normative will address what ideally should be done or what ideally should happen, this includes looking at the institutional and regulatory setups that allow for developments to occur. Normative questions are distinct from positive questions, which on the contrary make predictions and offer explanations. The primary normative question this research will seek to address is to demarcate the institutional development, legislative and regulatory developments in the infrastructure sector (especially the National Highways) and financial system. The positive question that this thesis seeks to address is to comprehend the trends in the outlay for National Highways, and predict how the governments will fulfill its obligation to the taxpayers and voters through public finance and public policy. The issue is also the continuity in government's policy where today's budget is not necessarily tomorrows, nor can the current public policies sustain themselves or be appropriate in the future. This study will refrain from looking at all the political details of a particular government's budget or public policies, as this will not provide useful, long-lasting knowledge. On the contrary lasting knowledge requires identification of general principles that remain applicable anywhere at any time (Hillman, 2009, p. 3).

This work will be in line with public choice theory where it will be in line with public choice assumptions:

- The three social objectives the state seeks to achieve through public finance and public policy include efficiency, social justice (distribution), and macroeconomic stability (expressed in avoiding inflation and unemployment and maintaining stability of the banking and financial system), although approach will not focus on macroeconomics.
- The scope of the study will also will extend beyond the narrow definition of economics as choice when resources are limited. Where the normative justifications for collective action is to improving the two activities – of allocative efficiency and redistribution.
- Public choice will be consistent with ideas within political economy, which is the interface between economics and politics and studies the economic consequences of political decisions and the economic role of the state (Hillman, 2009, p. 3).
- Focus will remain on (1) How much of the public good should be supplied? (2) How should the public goods be financed? It is obvious, although that the answer would differ for pure and congestible public goods?

The reason the public choice approach justifies researching how National Highways are to be provided, financed and regulated, is because if a free-access road was to be built, single individuals cannot imagine the use or simply be able to or

willing to build it. But considering that highways is a public good, beneficiaries of the road can get the government to levy taxes and build the road. However, with allocative efficiency as a social objective, it has to be determined whether building a road is justified as efficient public spending, and alternative methods of providing the service can be considered. The final decision whether to build the road will be most advantageous when cost-benefit analysis and applied. The cost-benefit criterion is that change is justified as efficient if (Hillman, 2009, p. 24):

$$\Delta W = \Delta B - \Delta C > 0$$

In evaluating whether public spending or public policy proposal $\Delta B > \Delta C$, the government requires information of the benefits generated to the user or beneficiaries. This for example, in the case of benefits achieved from highways or road would include reduced travel time with faster vehicle speeds, safety through reduced likelihood of accidents, while on the contrary the costs would include for example the environmental damage through pollution, social damage through land acquisition, or pollution and waiting time through congestion. However markets do not exist to reveal such benefits and costs as the nature and provision of public goods is beyond the scope of the market; and the benefits and costs are "externalities" associated with the proposed road, which cannot be grasped by rational, utilitarian individuals (Hillman, 2009, p. p25). The road as a public good is a pure public good as many people can simultaneous use the road, although owning the road has elements of monopoly, non-rivalry and requires immobile, scale economy investments that the market cannot conceive. Cost-benefit analysis helps governments indirectly seek to compute costs and benefits that are not revealed in markets for the earlier mentioned reasons.

Public choice started as an interdisciplinary field of study, since the late 1950s and early 1960s, outside the mainstream of both economics and politics. Many economists were, at the time, wary of applying economic models where there were not formal markets and price mechanisms to govern relationships, while political scientists were skeptical of rationality assumptions and formal modeling techniques inherent in economic study (Heckelman & Whaples, 2003, p. 797). Public choice literature has now left a deep imprint as a framework for analysis of the modern state in three areas that explores: mechanisms of collective choice; the behavior of voters; and the causes and consequences of government intervention in the market. As Leight (2008) broadly outlines the substantial body of literature in the broader public choice canon has now come to encompass: Interest Groups, Legislators and Regulators and the Issues of Capture, Voters and Rational Ignorance, The State and the Market. As over the last years, public choice work has also been criticized and over the last decades in this area new work has been extending into other fields, such as under political economy, new institutional economics, and positive political theory (Leight, 2008, p. 4).

The work of Jennings & Mclean (2008) remains very pertinent to this study as it discusses in detail the scope of public choice in achieving allocative efficiency as opposed to public finance approach which relies excessively on the government to protect citizens from market failure and redistribution (as summarized in the Table 2.2 below). Public choice in its purest form may view policy advice as largely pointless, while the best way to influence policy is through a common agreement at a constitutional stage to introduce institutional reform, which implements procedural rules and substantive constraints (Jennings & Mclean, Political Economics and Normative Analysis, 2008, p. 64). Although in solving the institutional principal–agent problem, democracy develops as a sequence of compromises between the ruler and the ruled and these institutions that still remain controversial. This is because government remains too powerful with too great an opportunity to be corrupt, as the policies in the end may move towards satisfying powerful interest groups rather than towards the public interest.

Therefore, while reviewing institutions and the regulatory development it is important to keeping mind that they do not happen in some ideal setting, but they

rather have evolved over time. These institutions may be efficient or inefficient, where they could be institutional inefficient of the kind of productive inefficiency of government institutions (which would include corruption); or where redistribution occurs although at a higher cost. This explains why inefficient policies and institutional arrangements can continue to exist, as there is sometimes no clear way of separating efficiency and distribution. This is exacerbated when citizens may not understand the policies being proposed have no economic incentive to become informed (owing to the probability of determining the outcome of elections being effectively zero) and thus are believed to choose irrationally. But even then a non-benevolent politicians although may not have any incentive to attempt to correct this ignorance but still may provide the policies that the people want regardless of their implication for social welfare.

Table 2.2 Public Finance and Public Choice in determining the Role of the State

Pure Public Finance	**Public Choice**
In an institutional vacuum, where the task is the technical one of devising policies to achieve maximum social surplus Policy advice may be ignored by politicians as it may conflict with the self-interest of government Focused on prescriptive analysis (Taxes/subsidies) The electorate depends on the altruism of politicians to receive benefits of collective decision making	Institutional development through regulatory bodies policy advice as largely pointless. Policy will emerge as the equilibrium of 'in-period' political play between the various political actors in a society, crucial to introduce institutional reform which implements procedural rules and substantive constraints. Focused on the creation of innovative and good institutions which align the self-interest of political agents with the electorate
Citizen's are passive, populism	Citizens are rationally ignorant, but there is vibrant political competition
Government is a benevolent dictator: To provide for efficiency, redistribution and macroeconomic stability (the traditional tripartite roles for public finance as defined by Richard Musgrave) Is focused on trust in the ability of government to intervene and solve for market failures, so government's become responsible for redistribution	Institutions are well designed to ensure the agent (the government) will take actions that serve the principal (the electorate) if it leads to being re-elected and being re-elected is attractive for the politician. Public Choice economists prefer the use of market forces in public provision on efficiency grounds. Focused on the danger of putting too much faith in government to solve these failures.
Big Governments	Small Efficient Governments
Public funds using direct/indirect taxes and Bank borrowing	Private sector participation and funding sought from Financial Markets Move towards privatization and reduced taxation and eventually the introduction of market forces in the provision of public services

Source: Compiled by Author from Jenning & Mclean (2008)

This work aims to look at the political economy of reforms (since the late 1980s), by creating a narrative and evaluating the overreaching changes in financing infrastructure in India, especially using the highway sector as an example. The broader study will attempt to look at changes in the structure of the Indian political economy within which economic reforms are taking place so as to go beyond a capitalistic approach of separating politics from economics (Dunn, 2009, p. 129). In other words a political economy approach seeks to be integrative and holistic in understanding issues related to policy and the real sector. While free-market models are most cogent at the level of individual consumption financial globalization has become more dangerous than we have realized (Krugman, 2009, p. 190). Even recently

with the Financial crisis since the late 2007, major rescues and restructuring are rightly being performed by the state, what often is ignored are the policy and regulations that govern capital and legislation of institutions. Further, approaching politics and the state as only consisting of parliaments and elected governments, only depoliticize the economy (Dunn, 2009, p. 220), and miss out on capturing various other aspects of the political economy. It is also to understand capital as incorporating both power and productivity. A broader definition could prove important for a political economy (PE) analysis, so as to help us re-interpret state and capital not as separate entities standing against each other, but rather as party overlapping institutions with intimately intertwined histories (Nitzan & Bichler, 2002, p. 51).

The nature of reforms in India, and the stress in policy circles to continue building efficient structure is a significant step in terms of not making collective decisions on basis of ideology but in terms of norms and their applicability. Most prevalent of studies on how states conform to a standard of civilization has been the early constructivist work in international relations. For this literature a norm may be spread through the creation of a 'civilizing' discourse. States willingly adopt the norm in order to demonstrate that they measure up to a standard of civilization, so that they can be good members of international society (Bowden & Seabrooke, 2006, p. 4). This has been the case with India, where the author argues that India is also adopting international standards and norms not only to be considered a civilized nation in the international arena, but also to benefit from the ideas that contributed to economic development and inclusive participation in the process of democratic collective decision-making. Much of the focus within political economy and international relations literature is on the processes through which global standards flow down to states, sometimes no often attributing to role of agency that is the receiving end of such standards. So developments that have occurred in India will also be put into perspective, with justification of why the government chooses a particular policy, and the rationalization behind it.

Though standards are implemented through a policy framework, by building technical capacity, in terms of a shift in the exercise of 'structural power', as authority shifts from states to markets under neo-liberal globalization regime, or through the inculcation of norms on what is appropriate behavior. "Similarly, in political economy literature on policy diffusion, particularly the notion of policy convergence, has been challenged by 'varieties of capitalism' scholarship that emphasizes how institutional change takes place along national path-dependent lines" (Bowden & Seabrooke, 2006, p. 5). Recent 'economic constructivist' work has also become sensitive to how essentially ideas are linked to interests, and how the spread of ideas requires struggle and contestation among social groups within a polity. This idea by itself, in the context of infrastructure development or financial reform would become a thesis by itself, as the political contestations of forward minded private sector specialists and government bureaucrats in India would like to see more far fetched reforms in India to improve productivity and efficiency. On the contrary the larger political machinery, with other inefficient sectors, labor unions, and interest groups would want to continue programs that support rather inefficient practices and economic assistance to corrupted institutions. As markets in India develop and evolve it remains to be seen as to how practices in institutional development will be benchmarked, by setting standards for countries and in the international arena, in the era of modern capitalism. An example being the way in which concession contracts are awarded in terms of building national highways (NH), when the associated traffic risks are high.

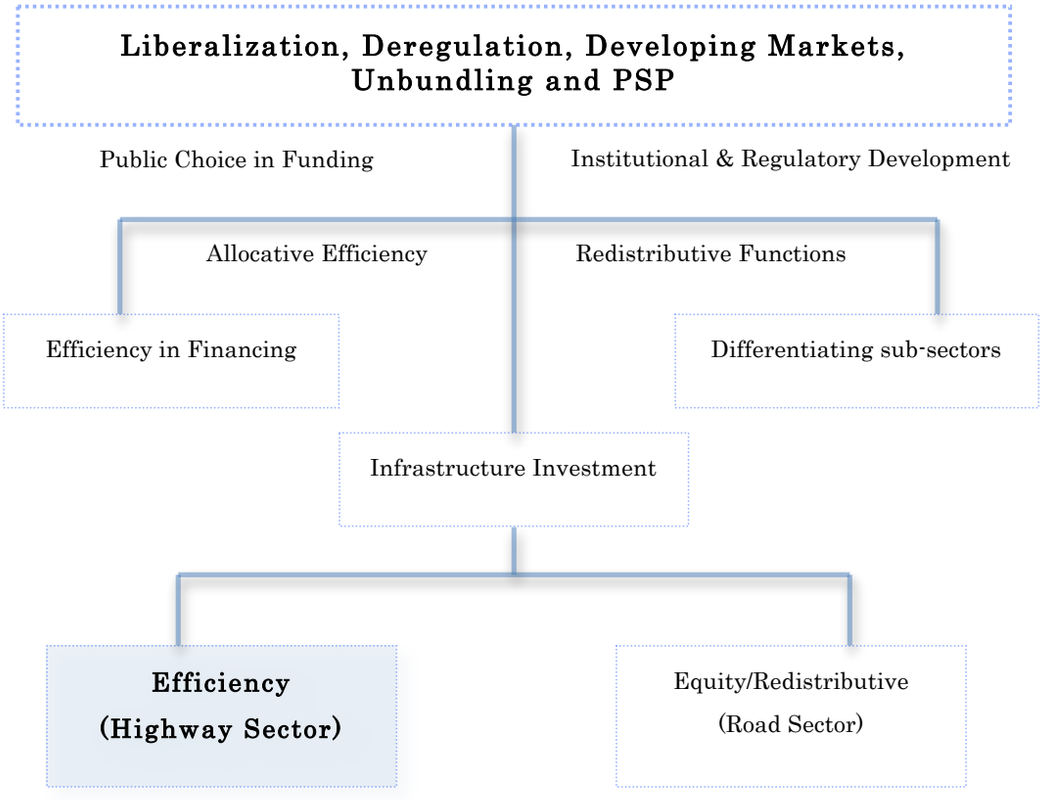
Considering state-centric constructivism where states can, not only change their identity and social norms, the state is both a product of and creator of normative structures (Hobson, 2000, p. 166). The trend has been in identifying and specifying the mechanisms of change through institutions, rather than the power of ideas themselves as independent variables. Different actors play an important role in which institutions

change and the way in which they draw authority and their ability to enforce. A good example of this would be the Bretton Woods system's capacity of reflexivity and its intention of eliminating uncertainty with deregulation (Seabrooke, 2007, p. 378). Using this fundamental framework, the discourse will seek to explain the terms in which actors within the political economy of India, have implemented the reforms through liberalization of the financial system, and unbundling of infrastructure activities. Financial liberalization is taking place through deregulation and the creation of various financial institutions. The aim in this regard is to achieve a post-Keynesian type of financial system, with well-developed banking and non-banking financial institutions and markets for a diversified range of financial assets. As in most developing countries, India too does not have developed financial markets, and growth has to depend heavily on bank credit. Especially with infrastructure investment, there is a strain on the credit-based financial structures and there remains a need to develop alternative institutions to finance long-term investment, to avoid the risk of financial instability and other adverse side effects of growth (Studart, 1995, p. xii).

For much of the period between 1930 and 1980, the dominant idea in most of the world on the delivery of infrastructure was that the infrastructure provider has the social obligation for universal service at a regulated price. Especially monopoly services which were in public hands. But this old system could not hide the cumulative economic failings with operational inefficiency, lack of technological dynamism, poor customer service, poor management accountability which resulted in a substantial waste of resources including overstaffing (Mody, 1996, p. xvii). This was exacerbated when the social objective of universal access, especially in providing public services to rural and poor areas was far from met. Infrastructure provision was reduced to a source of political patronage in a system where the consumer had virtually no voice. As this legacy is difficult to dismantle, this study aims at differentiating services into subsectors, where it is important to make a distinction between efficiency and equity subsectors. For example it is crucial to differentiate between the highway sector, that can attract more investment and PSP, and the road sector where the creation of capacity is costly and usage disparate.

In this regard, the theoretical supposition behind using the NH as a case study is that highways financing should be oriented towards efficiency as opposed to the road sector (that is state highway (SH), district and rural roads). This would allow equity gains by eventually freeing up more public resources that could be allocated towards the road sector. But the purview of the thesis will only be towards building the narrative and evaluating the efficiency of financing the NH. Putting efficiency in perspective, can take advantage of the gains from economies of scale and scope, alternative financing opportunities through developing financial markets, institutionalization that provides arm's-length regulation towards competition and between providers, accountability to shareholders, and profit incentives that will increase PSP (Figure 2.2). Although there is no doubt that the National Highway development will contribute to economic growth but it certainly also has a political economy benefit of connecting major regions and metropolis, in due course reducing transaction costs, time saving and in the long run reducing transportation, maintenance costs. Under normative considerations the use and importance of the National Highway sector (discussed in the next section) should decrease its dependence and burden on the public exchequer. On the contrary there is a need for the Highway sector to increasingly use market mechanisms and attract more PSP and finance that will also necessitate a road user charge regime.

Figure 2.2 Hierarchy Chart of the Model to be Tested



2.3 Research Methodology and the Scope of This Study

This study seeks to use an integrative, multi-disciplinary approach to document the financial sector and infrastructure sector reforms. In so doing it attempts to deduce any parallels in the way they these reforms have been implemented, and create a narrative to identify areas where reforms are being carried out to instigate economic efficiency in sectors like the highway. The thesis at large will attempt to use public choice to outline these developments and suggest possible policy implications. The Financial System is undergoing rapid transformation, but the issue is how intermediation will cater to the specific needs in financing different infrastructure sectors, by offering more alternatives for funding and PSP. The end goal is to evaluate if the reforms in the financial system actually benefit infrastructure investment, where the requirement is for large and long term financing. While previous studies have been mostly discussing few aspects of reform, political economy of a single sector, trends in the infrastructure or sub-sectors or aspects of the financial system, this study seeks to add value by being more integrative in its approach. By using the political economy approach, the parallel developments in the financial and infrastructure sector are laid out, as it will seen using the Highway sector as a case study, these two sectors complement and cross affect each other, and are important on a whole in the efficient allocation of resources that will not only promote economic growth, but also strengthen governance. The methodology is provided below in Table 2.3, and the data sources and their nature (primary or secondary) is provided in the Table 2.4 further below.

Table 2.3: Thesis Methodology

Methodology	
Political Economy Theoretical	Descriptive Analyses: Survey of Literature (Secondary) and Developing a Model to understand Public Choice and the relationship between Financial System and Infrastructure
Normative Approach	Descriptive Analysis (World Bank, 2006, p. 29): Outlining regulation in Financial Sector and Infrastructure Sector in India. Case Study of National Highways Case Study of Highway Development and Public
Policy Choice Analysis	Public Choice (Policy Principles) (Thomas & Mohan, 2007) and Regulatory Options: "*A regulatory system is defined by the combination of institutions, laws, and processes that give a government control over the operating and investment decisions of enterprises that supply infrastructure services.*" (World Bank, 2006, p. 17)
Policy Making Arrangement	Single Country Structure Case Study (World Bank, 2006, p. 29) Evidenced Based Policy Making (EBP) (Thomas and Mohan 2007) rather than an Ideology based policymaking. Case of Japan Highway Development and Financing Methods and Policy making process essential in influencing Policy Outcomes, that improve evidence: Policy as a process
Organizational Arrangement and Institutions	Owner, Financer, User, Regulator, Political Superior Broader Institutional Environment: Performance, Transparency, and Accountability

Table 2.4: Data Sources by Thematic Sections

Data Sources by Thematic Sections		Data Type
Public Sector Spending	Reserve Bank of India (RBI)	P
	Planning Commission of India	P
	Asian Development Bank	P
	Interviews with National Institute of Public Finance and Policy (NIPFP)	P
Indian Financial Sector	Reserve Bank of India	P
	OECD	P
	Asian Development Bank	P
	Shah, Thomas, & Gorham (2008) NIPFP, Interviews with Shah and Rajaraman	P&S
Infrastructure Spending	Planning Commission of India	P
	Committee on Infrastructure (CoI)	P
	ADB, Interview with Dr Rajaraman	P
National Highways	National Highway Authority of India	P
	World Bank (PPIAF) and Interview with South Asia Transport Engineer	P
	Ministry of Shipping, Road Transport and Highways	P
Japan Highway	Japan Highway Public Corporation, Ministry of Land Infrastructure, Transport and Tourism, Ministry of Finance	P
	Fiscal Investment and Loan Program (FILP), Ministry of Finance	P
	JEHDR	P
	Japanese Expressway Rate of Return (Iwamoto 2002)	S
Abbreviations: P – Primary (from Organizations and Institutions as well), S – Secondary (from other literature and other readings)		

This study will concentrate solely on the National Highway sector, as attempting to cover the financing of the State Highways (SHs) and other roads is too deeply interlocked into the complex center-state federal relations in India. Just to elaborate using the transport tax regime: such as on vehicle, licenses, registration, and so on, most of these taxes are collected by the state governments (refer to Table 2-5). The way these collected funds are allocated back into states would be scope for another study. Although it is not under the purview of this research, but is becoming more important to separate the functions and the accounting of the state and the federal government. Without undertaking efforts to differentiate more accurately between the revenues from the direct tax/user charge and from indirect road/vehicle taxes and expenditures, it will become laborious to even see how funds are being allocated to deduce the trends in financing.

Table 2.5 Classification of Road Taxes/Charges in India

Category	Central Government	State Government
Vehicle Purchase	Central Customs Excise duty on motor vehicles Central sales tax on inter-state transactions and shipment of vehicles	Sales tax on vehicle/chassis and cab/body
Vehicle Ownership		Motor vehicle tax (annual or lifetime Registration fee Certificate of fitness Taxes Levied on passengers and goods vehicles Entry Tax (vehicle brought from one state to another)
Vehicle use	Excise Duty on fuel Cess on fuel Excise duty on spares/lubes accessories Road user tolls	Sales tax on spares/lubes/accessories Sales tax on fuel Cess on fuel Road user tolls Permits & licenses Fines & penalties
Source: World Bank 2004		

The main limitations of the study is India's size; diversity and institutional complexity increase the difficulty of applying lessons from any case study to broader contexts (Rao & Singh, 2006, p. 22). The study can only evaluate the changes that have thus far taken place and further evaluate the plans and policy in terms of efficiency. This is due to the fact that even the early phases of the National Highway Development Program were only implemented in 1999, and there are some projects that are still being identified. With the sector evolving and new trends being observed, apart from all the changes in the international financial system, it is difficult to deduce the possible modifications in how the future phases are to be implemented. This study will only focus on the National Highway phases that are currently under implementation and the future plans outlined in the Authority's documents. Any attempt to evaluate the equity side allocation of funding in Roads would be scope of another study that would need to investigate into the intricate federal – state financial relations. Moreover, the authority to overlook the benefits of involving and regulate the private sector, profitability, and creating a user-charge regime only rests with the NH and the SHs (each state has its own regulation and financing plan), and so the National Highway sector is poised to reap rewards through the financial reform to be implemented with the central government.

As any research must set itself some limits, I will attempt not to delve into the vast issues in India's economic development but stick to the public choice in financing the National Highways in specific to the reforms underway in the Financial Sector and the unbundling and regulatory developments in the Infrastructure Sector. As the effect on both of these sectors on a country's economic development is not well established, they still remain crucial in providing the soft and hard infrastructure that is required to establish and maintain the path of growth and development.

2.4 Case Study of Japanese Highway Development: Evidence Based Policy Research

As this work is also an exercise on understanding the regulatory economics governing highway development in the context of a larger political economy. The author has chosen Japan as another case study to understand the basic regulatory options for two major reasons in order to explore how these regulatory options work in the real world by examining specific cases in which they have been applied in the past. The first reason being the most important, the regulatory framework governing Highway and general road policies are separated in both countries (that is India and Japan). And the other being the speed and rate at which Japan developed its highway program using a public agency. In this regard the author's interest is in the way Japan initially tried to build its highway based on a user-charge system, which could be a possible policy suggestion in the case of India. Although in reality the system never took off in Japan, as a different policy of large-scale public financing was implemented. Understanding the case-study approach is critical, in this study as it also provides key questions that are empirical. Each regulatory strategy has its strengths and limitations in theory, but it is important to understand how powerful these strengths and limitations are in practice. Cases are also valuable because as studying them is a good exercise in understanding the interplay of economics, politics, and institutions affects regulatory commitment and performance (Gomez-Ibanez, 2003, p. 14).

Extreme caution is also taken as to not make any direct comparisons, as the differences between the countries are too vast. Although there are great difficulties in conducting international comparative studies, relating political economies, regulatory economics, finance and infrastructure related studies. But conditions under which Japan developed its National Highways post war time and the conditions in which India has started developing its network post financial crisis are similar in that the national government's general account was insufficient to finance construction of a road network. Although the time and options available were entirely different, Japan sought to borrow from the Postal Savings system and the World Bank apart from developing a fairly effective user-charge system, while has for now started borrowing from the Multilateral Development Banks, fuel tax, and private participation. There are opportunities for India, through looking at Japan's experience to develop a more efficient user-charge system and private participation (through concessions) over time and to decrease its reliance on debt.

This study will only look at policy options in the context of time and evolving trends in the world, as just comparing countries absolutely will only be in vain. As countries are obviously in different development stages so that institutional settings, human capital, and the level of governance are necessarily different. Countries are also under different macroeconomic environment in terms of macroeconomic stability, fiscal situation, the government-private relationship, financial institutions, and the market of debt, equity, securities and bonds. Furthermore, surrounding international environment is different in mobilizing foreign financial and human resources. However, it would nevertheless be a good exercise to assess both successes and failures of country experiences to draw lessons that are worth learning from. As experiences are based on sound principles that are all not incontrovertibly successful, but the public policy choices, institutionalization through regulation, there is a growing need for systems to become flexible in order to face the challenges that are imminently ahead. This becomes essential as the ultimate goal of public infrastructure development and provision is to provide the public with quality infrastructure services at low costs (Imamura, 2002, p. 40).

Apart from the evident similarities of the political economic systems of India and Japan outlined below:

Similarities:

Both India and Japan accepted a Westminster parliamentary model as the basis of their respective constitutional systems but also selectively incorporated features of judicial review and of federalism that have been more closely associated with the U.S. Presidential-Congressional model than with the British model (Anderson, 2000, p. 146).

Both also adopted a political party system that allowed for dominant-party governments until recently are dominated by coalition politics. As in the case of India Congress Party and, and Liberal Democratic Party in Japan.

Both the cases of India and Japan have existing constitutions representing an essential continuity of the political order, although they have been amended over time.

Differences:

Their landmasses, size and geography, population, cultures, path of economic development, are just a few of the differences. Just looking at history especially following World War II presents to entirely different sets of foreign policies and political economies that put in place their own development paths. Where in order to promote democracy in Japan the U.S. military required the revision of the Japanese constitution to incorporate a "principle of local autonomy" through a two-tier system separating the local administration of prefectures and municipalities from national administration. Although Japan's structure is that of a unitary state, with its recent rapid urbanization and industrialization and concomitant growth in transportation and pollution problems, more public demands are being addressed through the local administrative structures. While India followed a more post-colonial path of socialist development, closing itself and

But for this study, the goal of rapid Highway development, the principles in which it was developed and financed, the institutional development and the context in which it was developed, and the exercises in regulatory economics will be used as the learning's for India's development of Highways. Although it is easy to label Japan as a bad example of Highway development in terms of the massive debts accrued and the eventual privatization, that is still under intense political limelight is by far misleading in the showing the successes in rapidly developing a system, over-emphasis of equity, and system that sought hard to develop a national highway network entirely on user charges (at least in principle). This has many implications for India, as the government has not been able to bring in any principle whereby it can justify its spatial and temporal cross-subsidization. Also a major similarity, and something of dire importance is the way in which Highways is segregated from the other roads in both countries, in order to focus and understand the issues only related to the Highway sector development, and treat it in terms of efficiency; leaving the other general road sector to solicit government funding and other equity benefits.

2.5 The Significance of the Study

This study will add value to the existing body of resources by evaluating the infrastructure orientation of financial reforms, especially by looking at the highway sector, which requires large investment and a prolonged timeframe for financial closure. As in this article it can be seen that there have been various institutional developments, regulations, financing options that have evolved over time in the Indian Political Economy. This study will stress that the way infrastructure investment was understood has changed over time, and in the recent period this has led to setting up of

institutions such the NHAI that regulates competition, management and execution of projects, promote PSP, MDB and market borrowing, provides viability funding to projects that are not so profitable and have high traffic risks.

This academic work seeks to outline the trends in the way India has developed its infrastructure sector, especially its national highway sector that has had serious supply side constraints due to the way it was perceived before the reform period. As it is been indentified as a sector that can gain greatly from economic efficiency, and less dependence on the public sector resources, it becomes crucial to evaluate the various policy options. With an increasing trend in revenue generation from treating the highways as an asset, there are also limitations on financing especially in crucial a time of rising inflation and interest, and liquidity constraints. The last few sections highlighted the growing opportunity for PSP and the active role of NHAI as regulator and mediator in implementing projects. But these trends still do not point to the financing regime that the NHAI wants to implement, and the resulting policy implications. Where financial reform in attracting intermediation to fund long-term investments in highways is a near possibility, the eventual evolution of a user-charge regime to recover costs to some extent is crucial.

The efficiency gains arising out of PPP's, especially through concessions have been documented in studies particularly to experience of many Latin American countries, which was the region where the system of concessions evolved systematically. In the case of countries like India with limited experience in competition law, although with the Competition Act, 2002, and a Competition watchdog CCI there is still a need to amend existing rules to allow more competition in maintenance of highways and airports under the public-private-partnership model (livemint.com, accessed August 4th 2008). However, concessions create privately operated monopoly or extreme cases of dominant position, with consequent market power, which is prone to be abused. This leads to the relevance of competition policy in the handing out of concessions, and over time the Indian experience will be an interesting case study hopefully probably with policy lessons.

The future scope of study depending on more access to data would enable studies on India's experience with concessionaires, especially in the case of competitive bidding experience, re-negotiation of contracts, oversight by the governmental agency with anti-competitive practices. With India's complex federal state and decentralization process, the success of the National Highway financing and development will further benefit the SH sector, by offering policy lessons and standardization in institutions and procedures. Where eventually principle of fairness would imply that the cost should be recovered from beneficiaries, it still remains unclear as to how user charges levied on in proportion of actual consumption will evolve in this exercise, so as to eventually also recover cost on the infrastructure development. Issues regarding Highway Infrastructure provision including prices, quality, access, rebundling, multi-modalism will not be addressed in this study due to the complexity and these issues will add future scope to research in highway infrastructure provision.

2.6 Indian Political Economy Timeline

The Figure 2-3 provides the basic political and economic timeline with growth and inflation date obtained from the World Bank data. Table 2-6 provides the key macro-economic data from the ADB (India - 2008 Fact Sheet, 2008). India's planned economic development that was set in place in the 1950s have been directed toward

1) Achieving a high economic growth rate,

2) Building the country's industrial and technological self-reliance,

3) Creating full employment, and

4) Achieving social justice by re- moving gross social inequalities.

(Malik & Kapur, 2009, p. 140)

These goals have been constant over time in India's political history providing consensus between the diverse-left-centrist-right political and ideological spectrum of political parties and the divisiveness of regional aspirations across India. This has allowed planning to continue to India giving it a new context in which to guide development. But controversies still exist about the nature of policies and methods to secure these aims. The early period in the political economy had Nehru's Congress Party provided socialist policies, in the direction of economic nationalism, autarchy, limited dependence on economic links with Western powers, and an abiding suspicion about Western economic colonialism following India's independence (2009, 141). These characteristics still exist in the economy, where economic planning had a strong bias toward state regulations and a preference for public sector enterprises, checks on private sector development, and development of a vast bureaucracy to exercise the controls and direct economic activity. The statist and socialist economic culture naturally distrusted market principles and globalization imperatives were shunned for the a few decades.

In order to not get into the details of the historical changes that took place, and in order to summarize the recent trend; apart from the countries undergoing great transformations since 1990s from a communist system to a capitalist system, India, for example had been operating on a mixed system. India in fact offers a prime example of a mixed-economy, with much more state-ownership and bureaucratic control than most other capitalist countries, and a ruling party with an ideology exhibiting some socialist features for first two or three decades. However, the party did not include in its program the elimination of private property nor the market, nor did it seek the retention of power at all costs. The big change that came in the 1990s was the then Prime Minister Narashimha Rao political approach that shifted toward partial economic reforms. The crucial aspect there was that he recognized that India was lagging behind China, a communist country that had accepted capitalist principles as the basis of its development, while India, a liberal democracy, remained tied to the principles of a socialist economy.

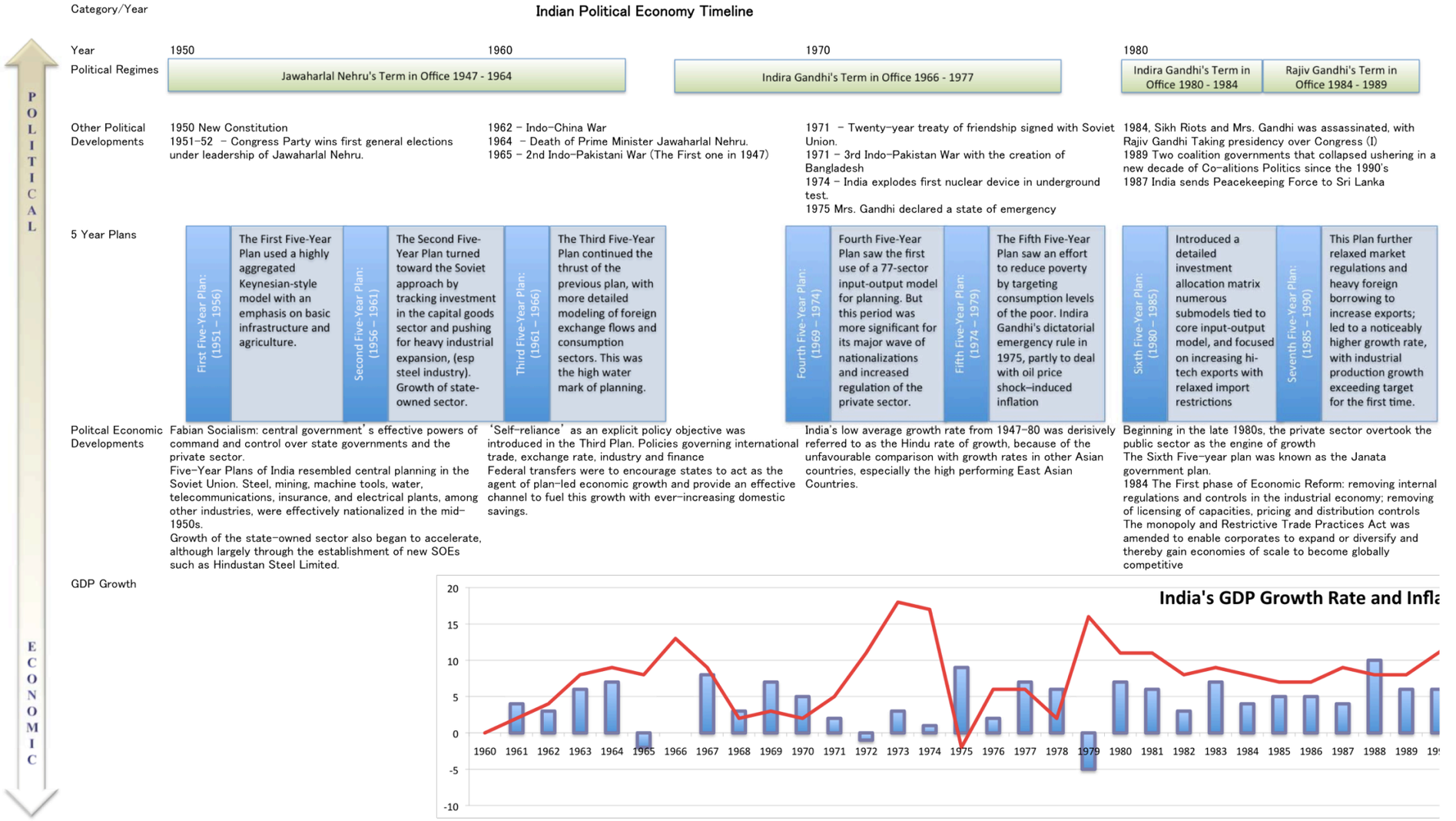
The dichotomy between the capitalist and socialist mode of production is that it will continue to persist, considering the size of the economy and the variety of interests that need social and economic protection from the state through voicing their political freedoms. In spite of this the ideas of free market, importance of private sector, and the vitality of global competitiveness took on national policy. The next regime that came into power, with the Bharatiya Janata Party (BJP) for the first time brought Hindutva politics to the center stage, actually vigorously continued the reform process. BJP's focus on a strong U.S.-India, India-West, and India-Israel strategic relations also took economic partnerships of private sector between India and the West. The Manmohan Singh government that came into power since 2004, with the regime reelected again

last year fortified the political support and the space for reformers despite initial resistance by their leftist coalition partner. This has left India with a new system of coalition politics, as the minority governments, both the BJP and Congress, have become weak and are in effect dependent on negotiating shared interests with allies especially in the area of economic reforms. Weak minority government leaders, whether economic nationalists or economic rationalists, are expected to contend on the approach for economic reforms, although it seems quite likely that the direction of reform will not divert.

Another crucial aspect has been India's look East Policy, where it has been intellectually grappling with catching with China and the rest of East Asia in terms of economic growth and international trade. India's path of economic development behind the Hindu rate of Growth from the 1950s through the 1980, which was coupled with food shortages and dependence on foreign aid, was fundamentally put to question. India's occurrence of poverty increased, although there was no famine or extreme food shortage (unlike during the British Raj). When India was faced with a serious economic crisis and an acute shortage of foreign exchange because of mismanagement of the national economy, it was the opportune moment to put in place the reforms that would contribute to growth, jobs and competitiveness. So by 2006 its gross domestic product (GDP) grew by 9.2%, with a foreign direct investment that grew 44% in 2006–2007 (US$16.0 billion, up from US$2.2 billion in 2003–2004) (2009, 143). The pace of reforms is expected to assist India in enhancing the human resource pool of 500 million young people who can engage the world and raise India economic performance.

As the political regime under Prime Minister Manmohan Singh has already become self-conscious of the infrastructure lag and deficiency, especially in comparison with China, institutions and systems have already been put into place to oversee developments. This actually includes the Committee on Infrastructure (CoI) that is under the direct purview of the Prime Minister and the Cabinet that has already started micro-managing infrastructure development across all sub-sectors (including NH). The trend is that in spite of the nature of the domestic politics and weak minority coalition governance and the theory of state controls and bureaucratic rule trumps economic rationality of the Indian and global marketplace and the social and economic needs of India's poor. Furthermore, apart from increasing productivity within the economy, there is a daunting task of reducing poverty that still stands at 30% of the population, despite significant growth in India's middle class and a slight reduction in the population pool that lives below the poverty line. Despite the lofty economic co-ordination goals that guide the Planning Commission, the Indian economy does not have much to boast about, as there are still grave concerns in the areas of social justice, economic disparities and the elimination of poverty. Although India's socialistic experiment has contributed to keeping the federal and state relations strong, it still remains to be seen as to how the public sector adopt to changing times and reduce its own size and operating inefficiency.

Figure 2.3 Indian Political Economy Timeline



*Source: World Bank, OECD, National Planning Comission, Rosser and Rosser 2004, Kelegama, Saman and Parikh, Kirit (2000), Rodden, Eskeland, and Litvack (2003)

Indian Political Economy Timeline (Continued)

1990 | 2000 | 2010

P. V. Narasimha Rao's Term in Office 1991 - 1996

Atal Bihari Vajpaye's Term in Office 1998 - 2004

Manmohan Singh's Term in Office 2004 - 2009

1991 Rajiv Gandhi Assasinated
1994 Ayodhya Incident – Communal Riots
1996 Congress led government marred by several major corruption scandals, led to the worst electoral performance
1998 India Conducts Nuclear Test
1999 Lahore Peace Declaration with Pakistan

2000 India's population reaches 1 Billion
2002 Since then – inter-religious bloodshed till the terrorist attack
2005 US-India Strategic Partnership with the 2006 Nuclear Deal that gets signed in 2008
2008 Terrorist Attack in Mumbai, Peace process paused
2009 Five Stage Parliamentary Elections

Eigth Five-Year Plan: (1992 – 1997)	Ninth Five-Year Plan: (1997 – 2002)	Tenth Five-Year Plan: (2002 – 2007)	Eleventh Five-Year Plan: (2007 – 2012)
This Plan had exceeded its target of Economic growth at 6.3% and domestic savings as a percentage of GDP raised to its highest at 24.4%, while Export earning reached 10.9% of GDP	Passed 50 years after Independence sought to tap the full potential of the Economy, but only grew at 5.35%. Aiming at rapid industralization, job creation, decreasing poverty, and controling population	Seeking 9% Growth, this plan aimed at making India among the top growing economies. Improving Financial mobility, S-O-T-A Infrastructure, reforming industrial sector, increasing literacy rate.	To support a faster and more inclusive economic growth at 10%, simultaneously improving education and health levels, reducing poverty. Increasing PPP's in Infrastructure

1991 BOP Crisis
1990's marked the Second Phase of Reforms, with the focus on foreign trade and exchange rate policies and financial liberalization
Since 1991 Domestic politics changed the Congress Party losing voter confidence and an increasing traditional caste, creed, and ethnic alignments, leading to the founding of a plethora of small, regionally based parties.

2004 After the First Full term of BJP led coalition Government the Congress (I) came back to power with United Progressive Alliance, backed by th Left Front
2007 Economic Growth during the 10th 5 Year Plan reached 7.5%, but the 11th 5 Year Plan has already suffered setbacks with the Global Financial Crisis since Late 2007. There is going to be a mid-term revision in the plan

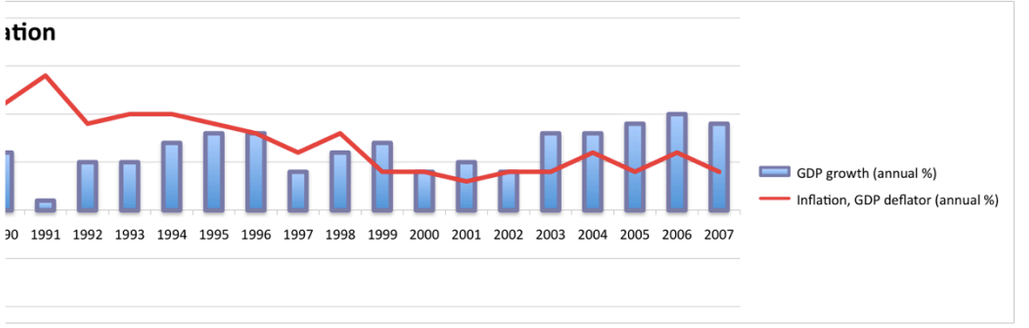


Table 2.6 Key Macroeconomic Indicators for India 1990 - 2007

Key Macroeoconomic Indicators for India 1990 - 2007

Year	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Growth rates of real GDP (percent)	5.3	7.3	8	4.3	6.7	6.4	4.4	5.8	3.8	8.5	7.5	9.4	9.6	8.7
Gross domestic saving (percent of GDP)	22.8	24.4	22.7	23.8	22.3	24.8	23.7	23.5	26.4	29.8	31.8	34.3	34.8 …	
Resource gap a (percent of GDP)	-3.2	-1.7	-1.3	-1.5	-1	-1.1	-0.6	0.6	1.2	1.6	-0.4	-1.2	-1.1 …	
Fiscal balance (percent of GDP)	-6.6	-4.2	-4.1	-4.8	-5.1	-5.4	-5.7	-6.2	-5.9	-4.5	-4	-4.1	-3.4	-3.1
Total Government Revenue (percent of GDP	10.7	9.9	9.7	9.4	9.5	9.9	9.8	9.7	10.9	12.6	11.8	10	10.6	12.1
Total government expenditure a (percent of GDP)	17.3	14.1	13.8	14.2	14.6	15.3	15.5	15.9	16.8	17.1	15.8	14.1	14.1	15.1
Total external debt of developing member countries (percent of GNI)	26.7	26.8	24.3	23.2	23.7	22	21.8	20.8	20.8	18.9	18	15.4	16.9	
Total debt service paid by developing member countries (US$ million)	8186.8	13565.8	11980.6	12413.3	12084.4	10106.7	10867.5	11720.7	15493.9	20650.2	19250.1	24334.7	17878.6	
Government consumption expenditure (percent of GDP)	11.7	10.9	10.7	11.4	12.3	12.9	12.6	12.4	11.9	11.3	10.7	10.4	10.3	10.1
Gross domestic capital formation (percent of GDP)	26	26.2	24	25.3	23.3	25.9	24.3	22.8	25.2	28.2	32.2	35.5	35.9	38.4
Interest rate on time deposits of 12 months (percent per annum, period averages)	9	12.5	11.8	11	10.3	8	7.1	7.1	5.75	5	5.5	6	8.25	8.4
Bank nonperforming loans (percent of total gross loans)								12.8	11.4	10.4	8.8	7.2	5.2	3.5
Stock market capitalization (percent of GDP)	12.2	35.7	31.6	31.3	25.3	41	32.2	23.1	25.8	46.4	55.7	68.6	89.8	

Source: ADB: Key Indicators for the Asia and the Pacific 2008

2.7 Between Complex Federal System and the Decentralized Party Politics

Six decades of democracy has increased the capacity of the political system, to deal with the kind of tensions that accompany such diversity, including communal rioting, violent expressions of linguistic sub-nationalism, religious clashes, and territorial claims made by regional elites, and the continuing conflict between the traditional and modern elements in Indian society. The divisive potential of extreme ethnic and linguistic diversity as well as religious segmentation in India have been mitigated by the division of the Union into federal states, often along linguistic and religious lines. Although at the time of during the 1950s when the original demarcation was done, many feared that redrawing state boundaries to conform more closely to linguistic and ethnic boundaries would lead to the breakup of the country. If fact if the country had actually broken apart, this would have been no surprise, to a casual observer of the Indian political economy as it was predicted fifty years ago. The combination of the parliamentary model with a federalist system has allowed the creation of regionally based parties and state governments for groups that otherwise might have scant influence or effective power sharing in a purely majoritarian system (Anderson, 2000, p. 146).

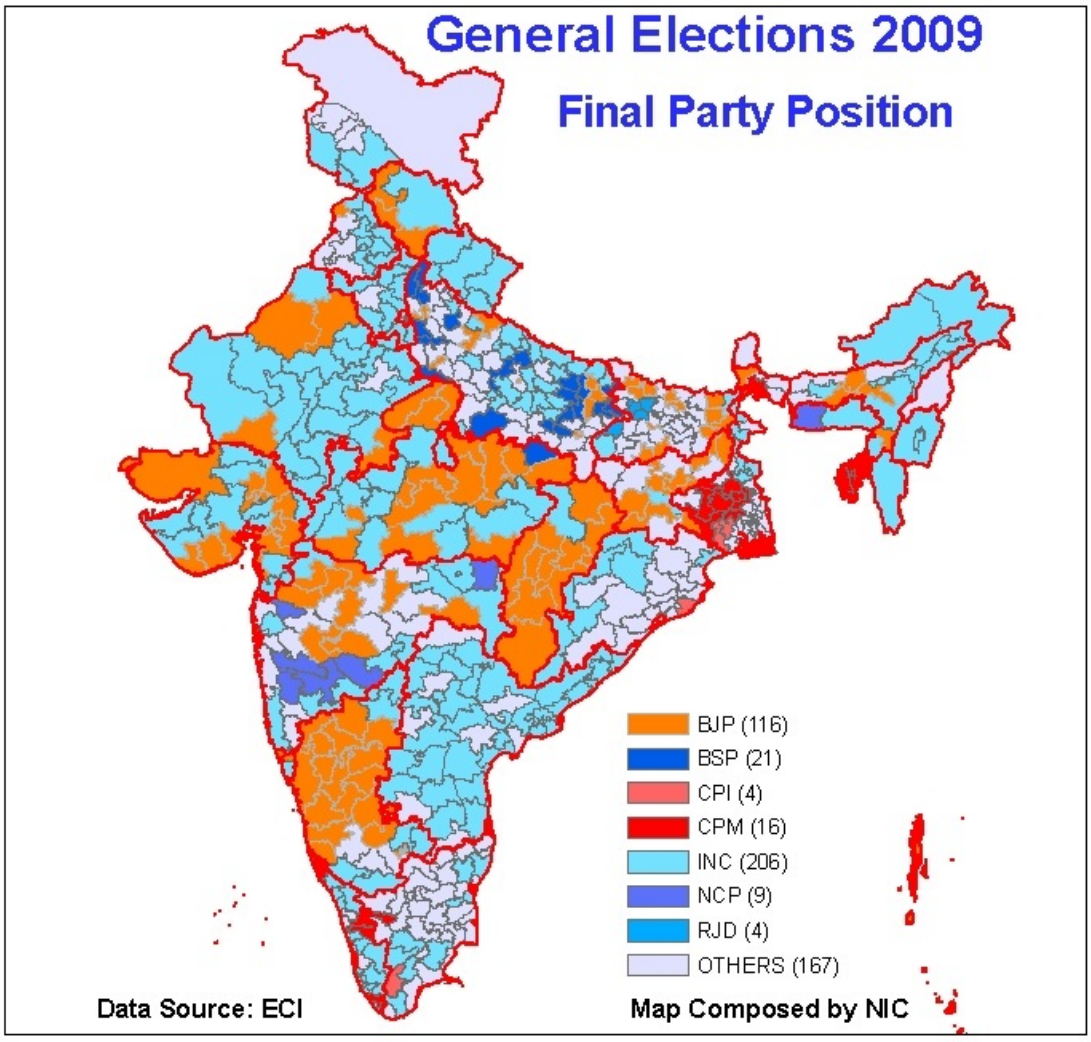
Although the ethnic and regional diversity of India and the decline of single party control at the level of national government have led many observers to predict secession and civil war, all this would in the real sense be a gross underestimation of the resilience and flexibility of Indian democracy. Part of the secret of this resilience has been the ability of the imported party system both at the federal and the state level, to be adapted to the pre-existing traditional identities grounded in religion, caste, and language. Another success factor has been the novice of Indian leaders, in contrast to those of its neighbors and many other third world countries, had drafted, adopted, and implemented a constitution that would become the pillar in providing stability and unity. India's leaders perceived the consolidation of the state through territorial integration and the establishment of effective political institutions as preconditions for steady economic growth.

Under the guidance of its charismatic leaders in the twentieth century, the Indian political system developed an institutional structure capable of facilitating the peaceful resolution of conflicts. Three key institutions that have also kept the fabric of the political system intact are the Congress party, the federal structure of the government, and an apolitical bureaucracy— aided the smooth transition of India from its colonial stage to political maturity since 1947. In the 1950s and the 1960s the Congress party functioned as a federal organization, with a consistent accommodative interplay of power politics between the regional and national elite and with strong grassroots support. Moreover, regional political leaders, especially after the states were reorganized along linguistic lines, were able to get their regional demands conceded at the national level. A combination of regional political pressure and mass agitation worked to produce political accommodation within the framework of Indian constitutional arrangements and its political nationalism. That way, sub-national tendencies were contained by political means rather than by armed struggle, and Indian leaders have experience and convictions to resolve disputes.

The Indian political system's resilience to extreme pressure was even seen with Prime minister's Indira Gandhi's efforts to manipulate the country's political institutions to achieve her personal and partisan goals, but the constitutional system has remained intact. The system of checks and balances exist in the Indian political system that was designed to be provided through as a result of work by the judiciary, media, and other opposition parties (especially the BJP), regional state administrations

and parties, civil society groups, and occasionally the president, despite the asymmetry in the distribution of political power in favor of the Gandhi family, who maintains the right to refer decisions (Malik & Kapur, 2009, p. 142). The stability and strength of India's political system had also been tested by the peaceful transition of power not only from one leader to another but also from one political party to another. Even when the assassination of two of the most important prime ministers of the country (members of the Gandhi Family), Indira Gandhi in 1984 and Rajiv Gandhi in 1991, the new prime ministers were sworn in smoothly and without any constitutional crisis. Although part of the explanation for this orderly transfer of power may be found in the institutional framework created by India's political system, but another important factor though not mentioned are the informal rules and procedures developed by the leaders to resolve succession struggles and intra-elite conflicts.

Figure 2.4 Results of General Elections 2009



Source: Election Commission of India 2009 ((Election Commission of India, 2010)

As the map above in Figure 2.4 depicts the results of the 2009 elections suggest, there is a growing diversity in the political parties that have evolved, replacing the single majority party regime till the early 1990s. The interesting fact is that there are certain pockets where National Parties (especially both the Congress and the BJP) have popular support. Other regions especially further away from the center have more regional parties that join coalition governments. Although sometimes seen as weakness and sign of instability, the growing number of and increasing power of national parties,

and the weakening of the major party power, could also mean more inclusiveness of electorate demands. Where negotiations and regional policies and development could be the result of the diversification and decentralization in politics. Given the population and size of India, it is important to growingly empower regions (especially through political representation through parties) and share the benefits of the political economy. In spite of more power sharing arrangements to form governments, it would surely provide more cohesiveness at the center in terms of evolving a culture of negotiations and reducing parochial interests.

2.8 The Complexity of the Federal-State Highway Policy: The Case of Tamil Nadu State Highways

In order to understand the Federal structure using the case of Tamil Nadu State (located in the Southern-East part of the country) is explained here. Where the policy and regulatory framework is defined by the various Central and State level Acts and Nodal Agencies, a number of reform measures have been undertaken at the policy, institutional, and regulatory level in each of the transport sectors for attracting private sector investment, improving institutional capacity for project delivery and enhancing efficiency of services. The road sector is a concurrent subject, where the jurisdiction of Central Government is limited to NH, while the jurisdiction of State Governments is across SHs, Major District Roads, Village and Other Roads. At the Central Level, the overall policy and program development and planning is done by the Planning Commission in consultation with the Ministry of Shipping, Roads, Transport and Highways (MOSRT&H) and Ministry of Rural Development (MoRD). Refer to the length of highways and roads that pass through the state as listed below in Table 2.7.

Table 2.7 The Statistics of Various Classifications of Government Roads in Tamil Nadu as of March 3, 2007

Sl.No	Classification	Length/Km	Maintained by
1	National Highways	4,483	3329 Km – NHAI, 1244 Km – Chief Engineer N.H., Highways Department (HD), Chennai – 5
2	State Highways	9,256	Chief Engineer (General) HD, Chennai - 5
3	Major District Roads (MDR)	9,451	Chief Engineer (General) HD, Chennai – 5
4	Other District Roads (ODR) (including 1746 Km of Sugarcane Roads)	38,256	Sugar Cane Roads – Chief Engineer (Projects), HD, Chennai. ODR's- Chief Engineer (General) HD, Chennai-5
	Total	614,446	

Source: (Government of Tamil Nadu - Highways Dapartment, 2010)

At the State Level, the overall policy and program development and resource planning is done by the State Planning Cell in consultation with Central Planning Commission and State Ministry in charge of Roads. Many State Governments have set up State Road Development Corporations for the Development and maintenance of Roads. The Government of Tamil Nadu has the unique distinction of creating a separate Highways Department as early as 1946 exclusively to attend to "Roads and Bridges" in the State. It was a part of the Public Works Department earlier but is now a separate department with seven Chief Engineers and other engineers and

administrative Staffs. A separate Highways Department was formed in the Secretariat under the Secretary to Government, Highways Department in 1996. The objectives of the department are to maintain and improve the roads under the control of the Government and to provide all weather road connectivity to rural habitations. Tamil Nadu was the forerunner in bringing out a standard specification for roads and bridges in the year 1954.

Table 2.8 Major Regulations, Developments in the State Arena: Case of Tamil Nadu

Year: Regulation, Legislations	Other Related Developments
1998 Tamil Nadu Transparency in Tenders Act	Other Manuals put in place, for example TN Budget Manual,
1946 creation of Highway Department 2001 Tamil Nadu Transparency in Tenders Act	There have been other State Financial and Accounts, and Financial Codes developed to maintain standards
Tamil Nadu Highways Manual	Includes: TN Highways Engineering Service Rules, and Subordinate Service Rules
2005 Tamil Nadu Infrastructure Development Corporation	Also includes a TN State Construction Corporation

Source: (Government of Tamil Nadu - Highways Dapartment, 2010)

The Jurisdiction communications, namely, roads, bridges canal banks and tank bunds rope way and other means of communication excepting Highways declared by or under law made by Parliament to be NH rests with the state. Criminal Appeals: jurisdiction rests with the state where public services - Statutory Rules of the service with which this Department is concerned - Revision of and amendments to these rules. In terms of financing too, a center-state divide exists where Indian state governments raise finance through omnibus issues organized by the Reserve Bank of India (RBI, Central Bank). However, the state issues are not government guaranteed. The omnibus issues are sold at fixed coupons and prices (the same for every state). Potential buyers subscribe at the fixed-coupon rate for the bonds of a particular state (the amount on issue for each state is not announced). The subscription is closed after 2 days even if some issues are under subscribed.

2.9 India's Public Finance and Public Sector Constraints

The current Union finance minister Pranab Mukherjee faces a grave task of reducing the combined fiscal deficit of the Centre and the states, which stood at an estimated 8.09% of GDP in 2008-09 (livemint.com, accessed January 30th 2010). Although over the years this was on the decline, and there was even a regulation put in place to reduce the fiscal deficit by law (refer to Figure 2.5), where even in 2007-08, the corresponding figure was only 5% of GDP. The deterioration of the public deficit reached its 16-year high, where the last time the country witnessed a considerable deterioration in its public finances was in 2001-02, when the combined weight of the Fifth Pay Commission payout and greater interest burden caused the fiscal deficit to balloon to above 10%. This time around the "real" figure stands even higher at 11.5% if bonds issued to oil and fertilizer companies are included.

The initial enactment of the Fiscal Responsibility and Budget Management Act (FRBM) in 2003 was the culmination of a lengthy attempt to devise a control strategy for public finances. The act requires the government to follow a strategy to reduce the fiscal deficit to less than 3% of GDP by 2009. But in the last few year when precisely

the global financial crisis hit India and, then finance minister P. Chidambaram abandoned the discipline of the FRBM Act. While FRBM targeted revenue deficit at 1% of GDP in 2008-09 and the fiscal deficit at 2.5% of GDP, the figures shot up to 4.5% and 6%, respectively. The Centre's "true" fiscal deficit is actually at around 8.5%. Giving up of FRBM targets is only partly responsible for the fiscal mess, where there are structural features that are believed to have caused the problem. Much of the reduction in the revenue and fiscal deficits was due to the extraordinary buoyancy of tax revenues from 2003-04 onwards and not due to prudent expenditure management. As in 2001-02, the inability to neutralize (or anticipate) the effects of pay commission awards, the refusal to pass on the burden of oil prices and under-funding of social sector spending had caused the deficits to balloon. Table 2.9 provides the Interim Budget spending for the 2009-10, with a trend in deceleration of expenditure represents where the government spends.

Table 2.9 Union Interim Budget 2009-2010 at a Glance (all figures % of GDP)

	2008-09	2009-10	Growth rate (%)	
Item	(RE)	(BE)	2008-09	2009-10
1	2	3	4	5
1) Revenue Receipts (i+ii)	10.4	10.1	3.7	8.4
I) Tax Revenue	8.6	8.3	6.0	6.8
ii) Non-Tax Revenue	1.8	1.9	-6.0	16.4
2. Non-Plan Expenditure	11.4	11.1	30.9*	8.1
of which:				
i) Interest Payments	3.6	3.7	12.7	17.0
ii) Defense Expenditure	2.1	2.4	25.0	23.7
iii) Subsidies	2.4	1.7	82.2	-29.9
3. Plan Expenditure	5.2	4.7	38.0	0.8
4. Revenue Expenditure	14.8	14.1	35.1	5.6
5. Capital Expenditure	1.8	1.7	17.9*	7.8
6. Total Expenditure	16.6	15.8	33*	5.8
7. Revenue Deficit	**4.4**	**4.0**	**359.0**	**-1.1**
8. Gross Fiscal Deficit	**6.0**	**5.5**	**157.3**	**1.9**
9. Gross Primary Deficit	**2.5**	**1.8**	**-403.3**	**19.8**

*: Adjusting for acquisition cost of RBI's stake in SBI at Rs.355.31 Billion in 2007-08.
Source: RBI 2009

In terms of financing the Central government the gross and net market borrowings (dated securities and 364-day Treasury Bills excluding allocations under the Market Stabilization Scheme) of the Centre for 2008-09 were budgeted at Rs.1.785 trillion and Rs.990.00 million, respectively. Extra-Budgetary items of the Central Government has been supporting Food Corporation of India (FCI), fertilizer companies and oil marketing companies through issuance of special bonds in addition to providing explicit subsidies on food, fertilizer and petroleum through the budget. These bonds are considered to be fiscal deficit neutral since they do not involve immediate cash flow and are, therefore, not treated as part of budgetary expenditure/ receipts. However, these bonds have fiscal implications as they carry an obligation to repay at a later date and, hence, add to the fiscal liabilities of the Government. Furthermore, as interest

payments on such bonds are treated as part of the revenue expenditure, they affect the revenue deficit and, thereby, the fiscal deficit. And during 2008-09, special bonds amounting to Rs.759.42 million and Rs.200.00 million were issued to oil marketing companies and fertilizer companies, respectively, together accounting for 1.8% of the GDP. Table 2.10 shows the gross fiscal deficit and their financing patters for two years.

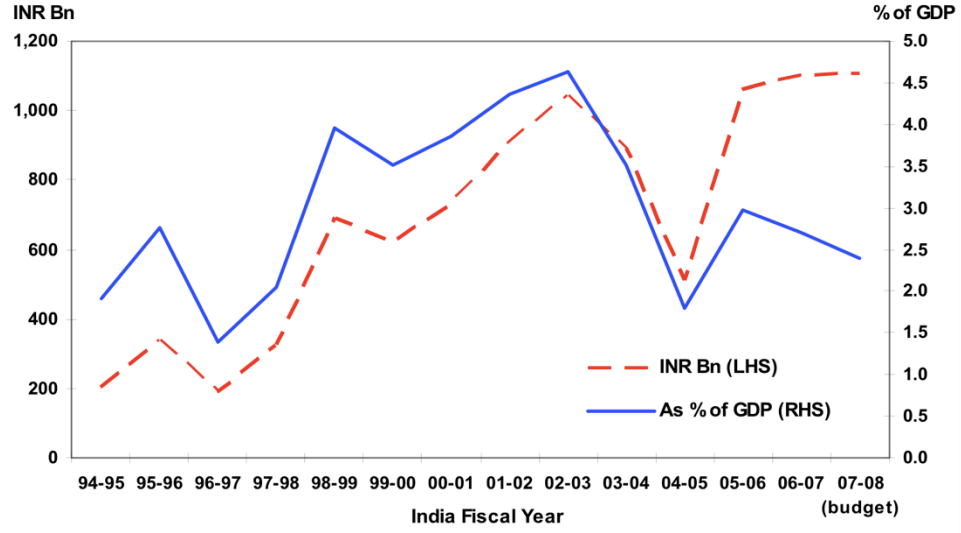
Table 2.10 Financing Pattern of Gross Fiscal Deficit (amount all in Rs. Billion)

Item	2008-09 (RE)	2009-10 (BE)
1	2	3
Gross Fiscal Deficit	3,265.15	3,328.35
Financed by:		
Market Borrowings	2,665.39	3,086.47
	81.60%	92.70%
Securities issued against Small Savings	13.24	132.55
	0.40%	4.00%
External Assistance	96.03	160.47
	2.90%	4.80%
State Provident Funds	112.06	10.22
	1.50%	1.50%
National Small Savings Fund (NSSF)	112.06	10.22
	3.40%	0.30%
Reserve Funds	-168.08	33.58
	-5.10%	-1.00%
Deposit and Advances	127.88	9,026.00
	3.90%	2.70%
Postal Insurance and Life Annuity Funds	25.94	26.72
	0.80%	0.80%
Drawdown of Cash Balances	299.84	0.00
	9.20%	0.00%
Others	44.86	194.77
	1.40%	5.90%

Source: RBI 2009

As Indian Government deficits have also been large so has been government borrowing since the late 1990s has been large and has grown rapidly. The revenue deficit increased to 5% of GDP in fiscal year 2001–02. Since then, although the deficit appears to be more under control at about 2.5% of GDP, growth has remained strong and suggests the actual deficit has continued to increase, calling for further government borrowing. India's issues are an average of less than US$75 million, with the largest below US$350 million, small by the standards of international benchmarks. The RBI has followed a policy of passive consolidation that reduces the number of bonds for the fiscal years 2007/08 and 2008/09 saw the retirement of 14 separate bonds for the addition of four new bonds reducing the number of bonds outstanding by 10 to 95. However, of the four new bonds, only one was over US$2 billion, representing an international benchmark bond, while the other three ranged from US$250 million to US$530 million. Significant characteristics of the government bond market include a large number of issues that can be quite small; a large proportion of electronic trading; the absence of bond- related derivatives; and (iv) statutory requirements on investors. Further below Figure 2-5, that depicts the size of government borrowing is, Table 2-11 that periodically lists the major legislations and regulations relating the government fiscal area.

Figure 2.5 Government Borrowing for Deficit Financing



Source: Reserve Bank of India.

Source: ADB (2008)

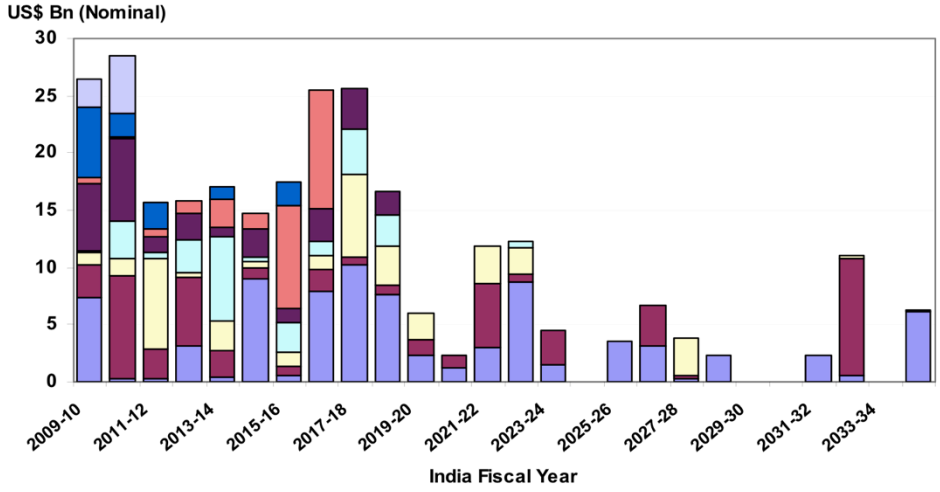
Table 2.11 Important Legislations and Developments in the Fiscal Area

Year and Legislations	Development and Details
Fiscal Responsibility and Budget Management Act, Enacted by Parliament, 2003	Target of reducing fiscal deficit; FRBM Act mandated the government to cut fiscal deficit by 0.3% every year to make it 3% of GDP, and revenue deficit by 0.5% to eliminate it by 2008-09 from 2004-05
	The government has announced a target of moving to a nationwide goods and services tax by 2010. This will allow a consolidation of the whole indirect tax system, by abolishing the central VAT
2001 The Clearing Corporation of India Ltd. (CCIL) was set up and went live together with the Negotiated Dealing System (NDS) of RBI.	CCIL set up for providing exclusive clearing and settlement for transactions in Money, GSecs and Foreign Exchange. Its function to Improve efficiency in the transaction settlement process, Insulate the financial system from shocks emanating from operations related issues, Undertake other related activities that would help to broaden and deepen the money, debt and forex markets in the country.
2002 NDS of RBI set up	NDS is an electronic trading platform set up to manage the exchange of government securities (GS) and other money market instruments. The NDS will assist the RBI Enhance the dealings of fixed income investments, Hosting new issues of GS. Eventually eliminate the physical exchange of forms between its trading members.
2006 the primary dealer structure was modified Government Securities Act, 2006	To allow banks to operate directly as primary dealers (separate primary dealer subsidiaries of banks were permitted to reintegrate into the parent bank). With currently six primary bank dealers and 11 "stand-alone" primary dealers. Primary dealers have privileged access to preferential finance at the RBI through the liquidity access facility, through repos and RBI's open market operations (permitted to borrow and lend in the money market, raise resources through commercial paper, and have the same access to finance from commercial banks as any other corporate borrower).
2005 Negotiated Dealing System–Order Matching Segment (NDS-OM) introduced by RBI	. This is a screen-based anonymous trading and reporting platform enabling electronic bidding in primary auctions and disseminates trading information with a minimum time lag. NDS-OM has had considerable success and has taken a dominant share of GS market trading
2006 RBI starts publishing a yearly issuance timetable for dated bonds	This Issuance Timetable seeks to increase transparency of issuance allows Issuers of government bonds and investors to plan their cash flows and investments more accurately, Prevention of market distortion by temporary excess supply and ensures better prices. Although since 2001, Treasury bill auctions (and not longer-dated bills) a published timetable was introduced for but not for longer-dated bonds.
2007 Government Securities Regulations,	

Compiled by author from various sources

As Figure 2.6 suggest in 2009–10, eight of the issues are due to mature. It is clear that at most maturities there are several issues, none of which is very large (or therefore very liquid). Other Asian markets have realized that small issue size does not enhance liquidity. India's issues as mentioned earlier are an average of less than US$75 million, with the largest below US$350 million, small by the standards of international benchmarks. The RBI has followed a policy of passive consolidation that reduces the number of bonds—the fiscal years 2007/08 and 2008/09 saw the retirement of 14 separate bonds for the addition of four new bonds reducing the number of bonds outstanding by 10 to 95. However, of the four new bonds, only one was over US$2 billion, representing an international benchmark bond, while the other three ranged from US$250 million to US$530 million. India retains a number of statutory requirements on investors. Banks, insurance companies, and pension funds are required to hold 25% of assets in GS. In contrast, foreign investors have only limited access to GS.

Figure 2.6 Indian Government Bond by Maturity



Mix of individual bonds maturing each fiscal year.

Source: Reserve Bank of India.

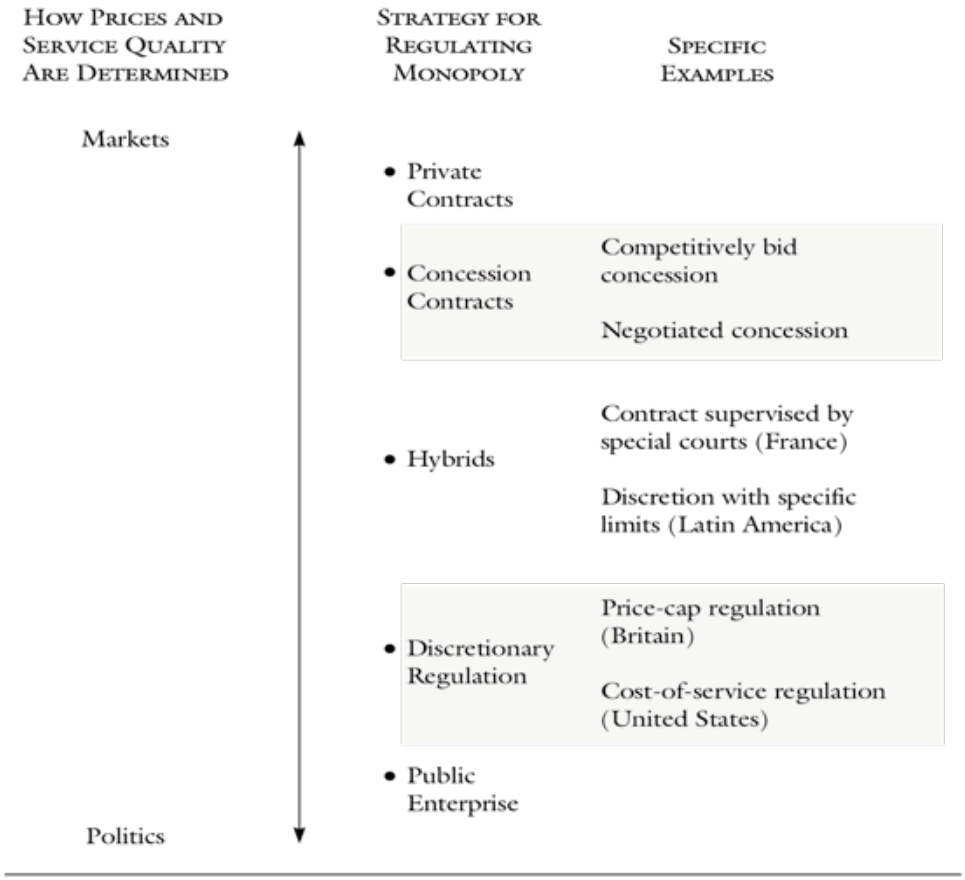
Source: ADB 2008

2.10 Rationale for the Allocative Efficiency

As discussed in the previous section with difficulties for the government to appropriately allocate its dwindling public financial resources to wide range of uses gets intensified with growing fiscal issues and public deficit. The same time government expenditures is also more closely scrutinized by the public that are now becoming more aware of the government accountability than before. As a result, the monetary resources that can be allocated to infrastructure provisions are becoming scarce. In this regard infrastructure supply is also being constrained especially in a fast growing economy like India not only requires funds for green field projects but also for the maintenance and rehabilitation. Such problems as under-maintenance of existing facilities and inadequate funds for new capital investment may trigger the privatization decision by the government. In such a case, the specific goal of the government for privatization is to find additional funding for infrastructure that government cannot otherwise provide. In other words, the private sector is expected to bring additional source of money from the private capital markets to help the government fund their infrastructure investment.

First motive is that the government tries to achieve fiscal restructuring through privatization of its public infrastructure provisions. Due to growing oppositions against taxation the governments in general are experiencing difficulties in raising tax rates higher than they currently are. Also, some governments are in effect reaching their borrowing capacity, which makes it difficult for them to obtain additional funds for infrastructure development through bonds or loans. While government finance is dwindling their demand to put into use for different spending purpose is expanding. While private firms that perform poorly are taken over or go out of business, Government agencies that do poorly are immune to takeovers and even may be given bigger budgets under the name of an attempt to improve their performance. (Savas, 2000, p. 112)

Figure 2.7 Specific Examples of Infrastructure Provision Arrangements



Source: Gomez-Ibanez 2004

Additional support for privatization comes from commercial reasons. At the same time there are also efficiency gains through dividing up the gains to leave all parties better off (Jennings & Mclean, 2008, p. 68). The problem is that such moves would not be rational for the government if they led to a change in political equilibrium that resulted in a loss of power or income. Inefficient policies and institutional arrangements may continue because no clear way of separating efficiency and distribution can be found. In many occasions it is argued that the public sector is inefficient. The poor performance of the public sector may appear in such observations as (1) inefficiency through overstaffing and low productivity (2) poor quality of goods and services (3) unresponsiveness to the public (4) obsolete practices or products and little marketing capability, and (5) underutilized and under-performing assets. But is not possible to compensate the losers of political change, because the winners will have

no ex post incentive to do so – there is a time-inconsistency problem. Inefficient institutions create a paradox at the heart of public choice analysis.

2.10.1 *Privatization*

As privatization accompanies the need for the new funding sources, privatization may also promote the development of capital markets (for example by creating and selling shares for the private companies). Also since the market for the construction industry is generally at its infant stage in developing countries, this will provide the construction with new opportunities in economies of scale within the infrastructure industry. When privatization is chosen as a method of reforming public. As "privatization" is a broad concept, within infrastructure provision there are still a number of possible arrangements broad policy concept that includes various kinds of possible arrangements that can be used to allow private sector provide on behalf of the government's in fulfilling its responsibility in public service provision. The literatures dealing in this area are broadly defined into the three broad categories: contracting out, denationalization, and public-private partnership. They are different in the scope of works delegated to them, ownership of physical assets, and the duration for which the arrangement/contracts lasts, and the risk allocation between the parties involved.

2.10.2 *Contracting Out*

The government can contract out operation and maintenance (O&M) contracts to a service provider of an existing project. This type of privatization is also sometimes called *alternative service delivery mechanism* where the government allows the public infrastructure services to be provided by private company serve the users on behalf of the government. In this way the government can, as a service provider serve the users using the private company's efficient delivery capabilities. This category is further subdivided by the payment mechanisms and resulting risk allocations into *contracting* (the private delivers services to the users and collects fees from the government) and *franchising* (the private delivers services to. and collects fees from. the users).

But these contracts again are based on user-charges if the contract is for the private sector is to handle its own finances. But in the case of goods or services where exclusion of free riders allowed, the government provision is the only possible option because the private is unable to charge users and cannot undertake the project by themselves. However, the delivery of the goods or services can be independent from the provision thereof and the delivery method with the best efficiency should be chosen. Otherwise the government could also use the private company out-sources the services to the company. For example by providing shadow tolls, as in the case of UK Highways, where since the government collects indirect transport taxes, it allows user to use the highways free of charge, and pays the private contractor annuities or compensates them on a fixed annual return. While the services are provided by the private sector the government retains the overall responsibility for the provision of the public service. The government specifically decides the scope of the contract.

2.10.3 *Denationalization*

Denationalization is also sometimes know as *divestiture,* entails the transfer of the ownership of an existing public service venture from the government to a private company. That is, the government actually sells existing facilities to the private company. It can take many forms- including public offerings of shares, or private trade sales of assets themselves. Once a public service is denationalized, the created private company becomes responsible for service provision to users, however the government can still regulate the industry (through creating a watchdog or regulating authority). This role of the government reduces the scale of government involvement, and can also be revenue generating, fixing public sector deficits, but still keeps the government

involved through legislations that allow it to either oversee service provision or regulate it. For example in India, the government completed the 3G mobile telephony auction in May 2010 that raised US$14.6 in government revenues. The government also considered the fee for spectrum allocation to be met out of rupee resources by successful bidders, which could then be refinanced through long-term external commercial borrowings (ECBs) under the approval route, so that companies could capitalize on the foreign exchange rates later. These kind of financing methods are also specific to countries and industries, and cannot be applied to all sectors, or experiences cannot be the replicated in the same way, everywhere.

2.10.4 *Public-Private Partnerships*

Since the 1990s governments have been looking for alternatives to deliver high-quality public services at low cost to the taxpayer and users. This led to the development of public–private partnerships (PPPs), both in industrialized countries (for example the United Kingdom, as in its Private Finance Initiative launched in 1992) and in the emerging economies (for example Latin America, Eastern Europe, and Asia in the 1990s) (Maskin & Tirole, 2008, p. 412). Where a PPP is usually defined as a long-term development and service contract between the government and a private partner. The government typically engages its partner both to develop the project and to operate and service it, usually taking up the political and legal risks. The partner may bear substantial risk (mostly financial and economic) and even raise private finance. Its revenue derives from some combination of government payments (annuities in the case of India) and user fees (for example tolls). PPPs were created and effective in developing large-scale projects with large immobile investments with long gestation periods, including those in transportation (rail systems, high- ways, subways), medical care, telecommunications, energy, water systems, and even orphan drugs. But sometimes projects that are undertaken may not align with public's best interest: as government officials may have a preference that differs from that of a social welfare maximizer. More specifically, ideology, social or political ties, or the incentive to pander may induce an official to favor the pet projects of particular interest groups, and induce "pork-barrel" politics—as many of these projects may not be justifiable from a social welfare standpoint (Maskin & Tirole, 2008, p. 413). Sometimes more regulatory setups and legislations including spending caps could mitigate the bureaucratic and political excesses.

Public-Private Partnerships (PPPs) although broadly is thought of as any arrangement where the public and private sectors cooperate to produce or deliver goods and services, it is specifically defined here in infrastructure projects to mean more specifically as to how the government and the private company share the risks and responsibilities of a project that would otherwise have to be assumed fully by the government. Conceptually PPP's consist of criteria in evaluating the viability of a project: and the private sector accepts a project and assumes more risk only if it is sees the likelihood of a profit. While for the public the incentive to do so, have both non-monetary and monetary benefits that are greater than the costs involved. When both parties cannot achieve its task by itself, the PPPs are more effective. For example when public finances are limited in terms of funds and ability to create infrastructure assets (and service delivery), it can capitalize on both private funds and efficiency through know-how from the private sector.

The government may enter into a contract with the private sector to build a brand new infrastructure projects (that is *greenfield projects*). In practice, it can take a number of structures with varying degree of transfer of risks and responsibilities. Build-Operate and Transfer (BOT) model and its variations are among the most common in this category. Under the generic BOT model, a private consortium receives a concession to finance, build, control and operate a facility for an agreed upon time,

after which the facility is transferred back to the government. According to Estache 2000, the relative importance of BOT types of projects is likely to further increase as a result of PFI in the U.K. Urban roads in the U.K. and Australia are increasingly being procured under the PPPs.

The justification as to which form of privatization is chosen rests primarily on the key element of competition as the amount of private participation improves quality and interest in the project (again regulated through competitive bidding). It is the most important for the government to establish a competitive environment where the private sector is motivated to maximize the efficiency and improve performance. Although the general theory is that the private firms can do better than the public it is only possible when such an environment is provided (through arms length regulation and yardstick performance ratings). This is especially important when the private operator is to undertake monopolistic services (which includes most large scale infrastructure projects) where market pressure does not exist.

First, these arrangements can be distinguished by the scope of delegated responsibility. In the initial state of government direct provision the private sector works under a direct supervision of the government. The contracts are closed for relatively small and segmented portion of the project and the private sector companies do what the government assigns them to do with no level of freedom and private sector contribution. In the next stage, the government delegates a wider range of activities to be provided by PSP for the project. The government defines general and functional requirements (in terms of design and minimum quality requirements) and the private sector decides the way to meet the requirements (can propose innovations for example), while the government retains the overall responsibility for the project, the private sector is allowed to make day-to-day management decisions. The financing of the project is also partly taken up by the private sector, where the government can also provide viability gap funding. In the last option, the government delegates all the components in a specific project to the private sector including the design itself. While the government is to establish overall development strategy for the infrastructure, most of the responsibilities at the project level are assumed by the private sector. The design, construction, financing and operation (DCFO) are managed by the private sector that also arranges the financing of the project.

Risks: The general rule often found in literatures dealing with the risk management issues is that risks (and associated costs) are to be minimized when they are assigned to the party that can best bear them. Also an additional notion would be that the risks are minimized when they are assigned to the party that is given proper incentives to manage them. In the initial state of government direct provision, the government assumes all the risks for the entire infrastructure development. Generally, the private sector is better at managing commercial risks and responsibilities such as those associated with construction, operation, and financing. In contrast, highway projects often depend on public participation and assumption in areas such as right-of-way acquisition, political risk, and in some cases traffic and revenue risks. Few of the risks according to Estache, Antonio et al. (2000) that are associated with different stages are mentioned below.

Construction Phase Risks: Constructions risks, Environmental and Land risks, Starting-up and Operation Phase Risks:

Traffic Revenue Risks

Financial risks: Interest rates, Price Caps, Inflation

Political Risks (usually assumed by the government)

2.11 Conclusion

The BOP financial crisis in 1991 triggered an era of multi-sector economic reform, and since then India has been coming to terms with its public finance constraints. Under these circumstances public choice argues that states are at the center of non-market collective-decision-making process, and can opt for various ways to finance and regulate their public goods and services. Some essential features of public goods (including highways) especially in developing countries has traditionally been provided by the public sector, leaving it outside the purview of the market. These characteristics include: 1) elements of monopoly, 2) right-of-way, 3) non-exclusivity, 4) non-rivalrous, 5) equitable access, 6) associated externalities, 7) network and economies of scale, and 8) durable and immobile investments. However this does not free the state machinery's responsibility from achieving allocative efficiency, which is one of its major roles under the assumptions of public choice. Under the public choice approach the other two main roles of the states includes achieving distribution and macro-economic stability. In this regard it becomes essential to separate services that seek efficiency in the allocation of dwindling fiscal resources so that they can be used for more distributive purposes. This treatise assumes that providing more choice in the financing of Indian National Highways, would eventually allow the state to relieve more resources towards the road sector (public good that is redistributive in nature; expansive with low demand and usage). With the economy of India developing rapidly, the demand for improved infrastructure services has become a supply side constraint, calling for more expeditious and innovative choices in financing. Although the Indian political economy is going through an era of coalition politics and its complex-federal nature limits uniform implementation of policies, there is a growing consensus in economic policy making and expanding public goods. This academic research will limit itself to normatively framing the role of public sector (public choice), financial system (financial intermediation), and infrastructure (unbundling) in achieving more allocative efficiency in financing National Highways. This will make the Japanese Case Study of Highway and expressway development pivotal as it offers key public financing lessons and understanding principles that guide policy development.

3 India's Evolving Financial System: The Potential for Financial Intermediation

3.1 Introduction

This section will seek to outline the Indian financial system in terms of the reforms that have been put into place since the early 1990s. This has fundamentally altered a system that defaulted with a financial crisis (BOP Crisis of 1991) that eventually triggered the broad based economic reforms that literally spread across all sectors including infrastructure and finance; which becomes the purview of this study. But the issue is how financial reforms have increased intermediation (especially towards long-term funding) that is crucial in developing and sustaining large and long-term finance requirements for infrastructure projects, such as the highways. As previous sections have already discussed that although India had already promoted a public sector oriented industrializing policy, it did not fair well in the general overall economic growth, in fact the allocation of public finance has been a problem, especially with financial repression. But the issue here is to track the systemic changes that are now being put into place as the economy moves from a bank-dominated financial structure in to developing credit-based system that would potentially increase financial intermediation.

In order to not to diverge from the purpose of this volume, this section seeks to profiling the financial system and tracking the reforms being implemented, so as to suggest the future scope of financing long term projects, and options that are available in order to keep the focus on investment, and funding (long-term as opposed to short to medium term financing) of infrastructure sectors, the markets and the instruments that have resulted from the financial liberalization will be elaborated here. As the various financial sub-sector interact with each other: Internal sector: Banking system, Securities Markets (Bond Market: government and corporate, Equities, including repo market, Mutual funds), Insurance and Pension, and the External Sector (Exchange, Foreign investors and their regulation). As each of these sub-sector's are in themselves expansive, the aim is not to delve into the details but to keep the study generic so as to understand the implications of the reforms in the financial system as India becomes more and more of an open economy. In order to bring into context the profiling of the system, a brief theoretical framework follows.

3.2 Theoretical Assumptions

Studart ((1995) in his thesis '*Investment Finance in Economic Development*' suggests the alternative approach to the role of banks, savings and financial markets in the process of economic development along post-Keynesian lines. While the post-Keynesian theory is based on a well developing financial market such as a developed banking and non-banking financial institutions and markets for a diversified range of financial assets. In this regard, it is crucial for developing countries to develop financial system that extend primarily beyond bank credit. The issue is as to how the so called 'late coming' industrializing countries tend to start with a bank-dominated financial structure and then move on into developing Capital-Market based systems. This is essential in establishing a functional financial system, which can finance accumulation without allowing for any financial instability, which is often a side effect in the process of rapid growth. This fundamentally requires efforts in establishing a credit-based financial system that will provide 'funds' – or long-term investments to

avoid the risks that are inherently associated with the financial fragility that is associated with economic growth. In the words of Studart (2000, 1):

> "In contemporary post-Keynesian theory, finance in a monetary production economy is sharply distinguished from saving—which is said to *derive* from, rather than be a pre-condition for, growth. Investment is the motor of accumulation and finance is what permits investment decisions to materialize. The supply of finance is *causally* determined by banks: it is banks, and not savers, who hold a key position in the process of growth. Only if they share the optimism of entrepreneurs in periods of growth or are led, for any other reason, to accommodate the demand for investment finance, can the monetary production economy grow. This conclusion would appear to leave no role for savings and, hence, for capital markets, but such is far from being the case. Saving, which funds (but does not finance) capital accumulation, has an important role, as we shall see, in maintaining the financial stability of the growing economy."

3.2.1 *Brief History of the Financial Models and Their Assumptions*

One major assumption in models of finance and economic development has been the idea of the 'prior savings' (PS) argument that implies a hierarchy in the dynamics of a capitalist economy: where savers, as suppliers of saving/capital, ultimately determine the pace of accumulation. The PS argument finds its origin in the agricultural economy, where income through the harvest is predetermined; suggesting that seeds that are saved, already need to exist before the act of investing them into the next planting season. This concept became the basis of the barter economy, where output and income were predetermined and hence the process of exchange, rather than production which is the main concern for the capitalist economic analysis. In terms of policy, PS based argument emphasizes the development of internal institutional mechanisms to stimulate saving; to attract foreign saving by opening the internal financial system (through foreign capital inflows); and to eliminate 'financial repression' and to correct other constraints to the functioning of the market-clearing mechanisms.

However, economic systems that have moved beyond metallic money to the use of credit and loans, investment can be financed by 'new money' as much as by the transfer of existing money savings. This within the eventual transition into a monetary economy, the only possible association between the finance and saving is the use of accumulated stocks of money to finance investment, rather than consumption. In this context another theory that has been crucial in the analysis of a monetary production economy is the Loanable Funds Theory (LFT). In an economy where metallic money prevails, the evolution of bank money does not change this postulate as long as banks as well as other financial institutions are pictured as mere intermediaries between saving and investment. That is, as long as credit, financial markets as efficient intermediaries are all neutral in the sense that it does not interfere with the real forces behind accumulation (thrift and productivity). This has allowed mainstream economics to address saving without even mentioning the mechanisms and aspects of financial system that are essential in transforming it into investment. But these new Keynesian models completely avoid explaining the availability and distribution of information between borrowers, lenders and financial institutions, basically running on a perfect information hypothesis.

These issues immediately make the modern financial systems really complex in dealing with financial intermediation which can jeopardize the allocative role played by intermediation: adverse selection, where trading parties have asymmetric information prior to contracting, and moral hazard, where the asymmetries arise after contracting. Asymmetric information occurs when lenders have trouble determining whether a borrower is a good risk (that is good investment projects with low default risk) or a bad risk (bad investment projects with high default risk). This will result in

the decrease of loanable funds when interests rate increases and lenders cannot identify the riskiest projects, on the other hand when interest rate decreases moral hazard may prevent lenders from extending credit. Thus in both cases asymmetric information does not allow financial system to play its role as a broker in saving-investment process efficiently, as lending would be at sub-optimal levels. In this sense it is not easy to just assume that financial markets are efficient allocators of capital, although there were considerable literature that suggested so.

By bringing production into the picture, where in an entrepreneur economy, the means of production are privately owned, so that a profit-seeking class through hiring labor organizes production. Assuming that the costs of production are known, output decisions will be based on the expected demand. Since time is irreversible and production must precede demand (1995, 10), production decisions have to be taken in an inherently uncertain environment. Where uncertainty becomes the trademark regarding production the issue is about the return on long-lived assets, which is more uncertain than the return on current production. Given the fact that investment generally involves long-lived assets, the volatility of investment is greater than that of production. This brings in the factor of speculation on investment decisions, which has a negative impact, raising uncertainty on the return on any productive activity in a decentralized economy. Apart from that a further source of volatility to investment is the fact that, it property as a store of wealth, it competes with other assets and means to accumulate. This is where the rate of interest enters Keynes's principle of effective demand. In a monetary production economy, money is demanded both as a medium of exchange and as an asset. As an asset, it provides its holders with the ability to carry wealth into the future, which then also introduces the concept of the rate of interest.

As entrepreneur economies are in essence forward looking systems, where production is a time-consuming activity, which requires that entrepreneurs commit (their own or borrowed) resources before the return on the output is known. This substantiates Keynes law of production the process of production will not be started up, unless the money proceeds expected from the sale of the output are at least equal to the money costs which could be avoided by not starting up the process (1995, 29). As an entrepreneur economy is based on decentralized contracts (between entrepreneurs, workers and suppliers) they denominated with money; which would then be the accepted medium of exchange and store value that has the power to discharge contracts. Money allows the entrepreneur to have access to the physical resources and labor required for production thus whoever has money or the capacity to create money (for example the State and banks) can influence the allocation of resources. This would suggest that a in an entrepreneur economy, finance and investment again precede savings; in a credit based bank system banks can create credit independently from previous deposits.

However in mainstream economics saving has been associated with finance in a different way through models concerned with finance and development. As capital is commonly assumed to be the scarce factor in less developed countries (LDCs), so saving is thought to be constraining growth. Although it from the discussion above it expected that development would be somewhere associated with debt issue at some points in the economic system and corresponding accretion of financial assets elsewhere (1995, 17). This would also be in line with Keynes's paradigm of a monetary production economy in confirming that banks (and not savers) are the suppliers of finance this was however not the case. While in fact development economics has treated finance for the last thirty years mainly as a problem of availability and allocation of internal and external saving (2000, 18). In this regard the two models that have dominated the literature: Two-Gap Model (TGM) and the Shaw-McKinnon both which are based on the 'PS argument which are outlined below.

Table 3.1 The Two Main Models that have Dominated Development Finance

Two-gap model
The TGM is concerned with the *external* finance for resources to support development and with development planning; claiming that external saving is required for development if both the investment-saving and the import-export gaps are to be overcome. Two-gap models are based on the idea that since there is a lack of internal saving usually in developing countries, due to financial repression policies this in turn would constrain economic development. This would call for external saving in two initial stages of development: first, to overcome the difference between planned investment and saving; second, to finance the increasing gap between planned imports and exports. The short-term disequilibrium between internal saving and investment will be overcome in the long run when per capita incomes increase (allowing for a higher propensity to save) and its export capacity (by improving productivity in export sectors), it can finally achieve self-sustaining growth and even repay the debt acquired in complement of financial aid (Chenery and Strout 1968: 913, cited in 1995, 21). This became the official theory on which policies were formulated by International Monetary Fund (IMF) and the World Bank till the 1980s. But in reality after the interest rate shock of 1979 and the Mexican *de facto* moratorium in 1982 led to a fast contraction of credit to the highly indebted LDCs, the growth-cum-debt strategy was completely discredited and a but later abandoned due to the debt crisis in the late 1980s. This was because, for instance if a continuous balance-of-payments deficit problem is interpreted as scarcity of internal saving, then the solution is to increase internal saving. But, if the PS argument were carried out consistently this would exacerbate the situation, as it requires raising interest rates and internal absorption must be reduced in order to re-establish the external sector equilibrium.
Shaw-McKinnon Financial Liberalization Model (FLM) (Shaw and McKinnon 1973)
McKinnon model deals with the increase and mobilization of *internal* resources, mainly through the liberalization and deregulation of internal saving. The prior-saving argument is also present in the FLMs, which maintain that internal saving/ investment can be increased by stimulating savings with positive interest rates and by enhancing the competition between financial institutions through financial deregulation. Since the 1980s the FLMs substituted the Two-Gap model, which emphasizes the need for LDCs to increase internal saving rather than counting on external saving. The PS argument remained; it was only the historical circumstances that changed. The FLM exerted considerable influence on macroeconomic policy in developing countries in the 1970s and 1980s, again particularly through the recommendations of the IMF and the World Bank. The analysis is based on the idea that many developing economies suffer from financial repression, a 'misguided' development strategy of low interest rate ceilings and selective credit policies. It is argued that financial repression inhibits saving by deliberately maintaining interest rates below their natural level. With financial repression, the argument goes, even though investment opportunities abound, growth is kept below its potential Perhaps the most interesting aspect about most FLMs is that they are completely devoid of institutional content; they completely disregard the institutional aspects of LDCs financial systems. Thus, within its rationale, solutions to problems related to the financing of development need only consider re-adjusting relative prices. For instance, the lifting of deposit ceilings is pictured as a panacea that would lead to the establishment of a superior equilibrium position with higher levels of savings, investment and growth. It is also assumed that a less regulated and less 'repressed' financial market would equilibrate saving and investment optimally. Given the above framework, the policy of 'financial repression' is about promoting investment by maintaining the real deposit interest rate below its (positive) equilibrium levels. Such a policy would result in the rationing (non-price allocation) of scarce saving—which is seen as a

fertile ground for inefficiency and an easy source of windfall profits to the banking system. When associated with government deficits, it would reduce the availability of scarce resources to the private sector, leaving savings to be unproductively allocated by a shortsighted bureaucracy.

Source: Studart 1995

3.2.2 *FIS Model in the Context of Capital Market Based Financial Systems*

This finally brings in context a post-Keynesian model of finance-investment-saving (FIS) circuit as a substitute to process of investment finance that is based on the finance-investment-saving-funding (1995, 48). The FIS model integrates finance into the multiplier to show how saving is created as a by-product of the process of income creation. For this reason it has been used by many post-Keynesians to demonstrate the precedence of investment over saving, and it has been used as an analytical tool to develop a systemic view of the role of banks, saving and financial markets in the process of growth. Studart (1995) proposes that the FIS model when actually used in the context of Minsky's hypothesis: a growing market economy is inherently more fragile. This can be seen through borrowing from banks to finance investment increases short-term indebtedness, exacerbating firms' capacities to repay with their own cash flows, as they have to wait until their investment projects mature and their productive capacities expand. Therefore, a bank-financed expansion leaves the corporate sector in a more vulnerable financial position. But if the firm finds difficulties in selling its liabilities during the period in which it is refinancing debt, the firm's liquid assets are rapidly depleted simultaneously eroding its equity.

Where Studart's thesis makes a diversion and is pertinent to being used as the analytical tool in this section relates to the question of 'funding'. Where the argument goes beyond a post-Keynesian theory for individual savings and financial intermediation are secondary in the determination of the aggregate supply of investment finance, they do matter in a different context of funding. Seen from a microeconomic perspective, entrepreneurs and bankers desire to fund their long-term commitments on a stable basis because of the uncertainty about the prospective conditions of credit and levels of interest rates. Funding by nature increases the risk of both borrowers and lenders, where investment finances in a world of uncertainty becomes characteristically a two-fold process of 'finance' and 'funding'.

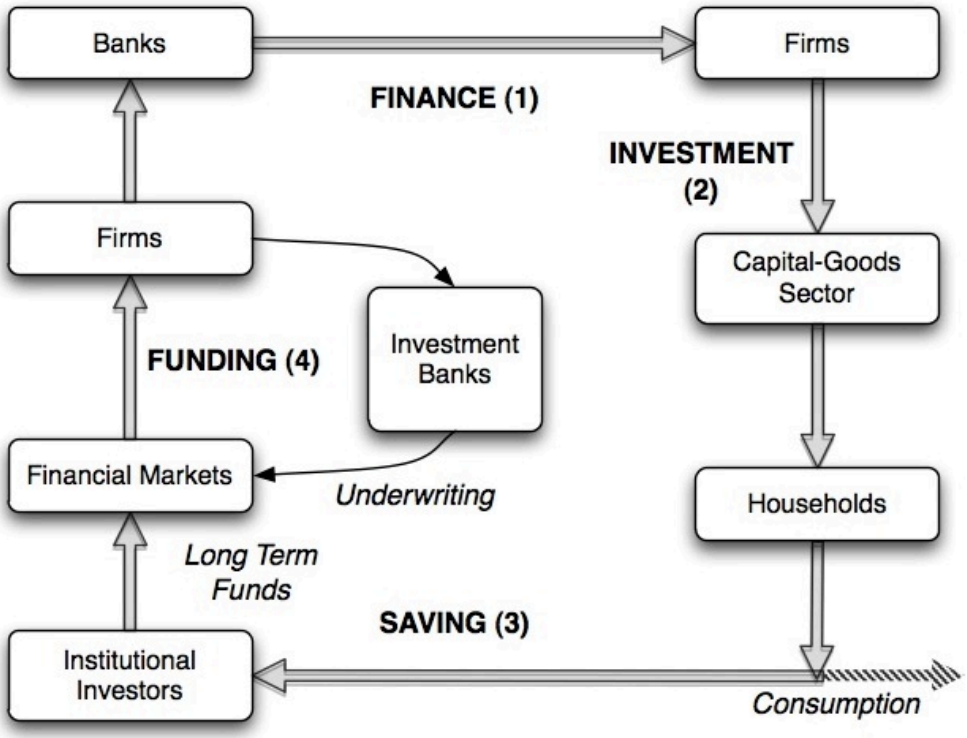
From a microeconomic perspective, they may increase the tendency of firms and banks to engage in the financing of long-lived assets. This by far requires regulation and specialized institutions that are crucial in the provision of information for firms issuing securities, underwriters and demanders of securities. This also requires secondary markets that will enable investors to evaluate the prospective profitability of newly issued securities by enhancing the flow of information.

From a macroeconomic viewpoint, funding especially developed through financial markets bears a crucial role in mitigating the increasing financial fragility inherent in a growing monetary economy. This macroeconomic role of funding will also depend on the interrelated characteristics, the size and stability of the respective financial markets. A thin financial market is unlikely to be able to protect the economy from the phenomenon of short-term speculation and volatility, which tend to disappear in the long run. Moreover, contradicting expectation the very existence of the secondary markets (where old securities are sold and bought) relies on continuous trading, and this in turn is expected to provide the liquidity that makes it less risky for wealth-owners to hold long-term securities. Supposedly this provision for liquidity can be expected to make long-term bonds and securities attractive to savers, as they are searching for safe liquidity time-machines (1995, 60), and rarely wish to be locked in to holding an asset for a long period of time.

Under this new model, although financial markets have an important yet ambiguous role in supporting growth, they intermediate between the demanders of securities and those firms wishing to fund their short-term liabilities. However the adverse effect of instability brought by the speculative nature of these markets cannot be ignored. One element that is largely taken for granted is the role of financial intermediaries in the process of financing/funding investment is the assumption (of the FIS model) that savings are automatically somehow held as long-term securities. This is assumption is not only idealistic, but also reduces the importance of the financial intermediaries (middlemen/broker) in the process of funding accumulation. In this regard, what makes financial markets crucial in reducing the financial fragility inherent in growth is their ability to transform short-term assets (which are demanded by savers as forms of 'liquidity time-machines') into long-term sources of funding.

One good example of this phenomenon is illustrated in the segmented financial markets which existed in the USA before the deregulation of the 1980s, the commercial banks provided sight and short-term deposits against short- term commercial and industrial loans; investment banks were specialized in converting short-term borrowing into long-term borrowing through underwriting operations; and institutional investors (for example insurance companies and pension funds) would invest savings on behalf of the general public (1995, 60). Another development that has occurred in the last century, is that in most countries domestic banking was generally subject to heavy regulation, and the traditional role of banks have been fundamentally altered from collectors of deposits and granters of loans. As initially international banking had to cope with the restrictions of capital controls, recently the process of deregulation and the world-wide removal of restrictions on international capital movements have led to the integration of global capital markets. The integration of world capital markets has shifted the role of banks to become arrangers of bond and equity issues, that is, investment banking. Under this finance-funding mechanism of this specific institutional structure is illustrated by Figure 3.1.

Figure 3.1 Finance-Funding Mechanism of FIS model



Source: Adapted from Studart 1995

While applying these distinctions in the analysis of LDCs', suggest one of the main problems with the debt problems. The crucial problem with LDCs' debt was that even though the international banking system substantially increased their capacity to *finance* firms in developing countries, the institutional mechanisms to *fund* them were not available in the 1970s and 1980s. The reasons for this are many, the most important reason being that there were hardly any companies in LDCs that could raise funds abroad through floating stocks and long-term securities in a more organized international financial market. This was supposed to be reason why in the 1970s there was only a significant increase of international bank loans with floating interest rates (or at short maturities), on top of that banks required the guarantee of LDCs' national governments. The rapidly increasing loans with short-term maturities to LDCs almost immediately not only put the LDCs and the international banking system into a more fragile position, but also triggered the debt crisis of the 1980s when the monetary polices of LDCs caused an increase in interest rates. For though technically these borrowings were used to finance expansions of the productive capacity to export (which was not always the case), LDCs could not repay their debt, sometimes even before such capacity could be put into place.

According to the mainstream view, this institutional underdevelopment of financial markets (either thin or unorganized) was the result of the 'long history of financial repression in developing countries' (1995, 22). Further, the general assumption to launch financial development could be promoted by financial liberalization, which was alleged to increase saving and therefore investment. In this view, the role of banks in the process of growth was to supply finance, whereas saving and financial markets provide funding. Therefore, in order improve capital market efficiency it becomes important to shift from a neoclassical perspective (where the main role of the financial system is to allocate saving between competing investment projects) by using other tools to assess how different financial structures function as promoters of growth. The neoclassical perspective also assumes that the competitive capital market saving/capital is allocated optimally spontaneously, and further real-life institutional arrangements are also seen as implicitly distorting in relation to the optimal outcome of the idealized structure. Therefore there is an apparent danger in assuming that there is an 'optimal' financial structure that does not really exist, instead different financial structures are required to sustain growth and funding according to the nature of the respective economy.

Studart (1995) suggests that from a post-Keynesian perspective, financial systems are more than intermediaries between saving and investment: they create saving (through finance) as much as they allocate saving (through funding). The role of finance and funding therefore becomes pivotal in an entrepreneur economy: where finance creates the means of commanding resources that will permit entrepreneurs to implement their production and investment decisions; funding represents an incentive for both banks and wealth-holders to hold securities and, additionally, reduces the financial fragility inherent to growing monetary economies. Further, financial institutions (and especially banks) will, because of the liability structure, prefer to remain in the shorter end of financing if that is possible. In a fast-growing economy, with constant pressure on finance, banks and financial institutions can profitably grow simply by providing short-run finance to credit thirsty enterprises without creating the competitive stimulus to finance long-term positions. In this case, in order to grow, firms will have recourse to renewable short-term credit, self-funding or foreign indebtedness in order to implement their long-term and large scale investment projects. This would by far be the case with firms providing infrastructure services in India too.

To slowly develop structures to support funding, it becomes important to recognize the development of stable financial markets as a long-term strategy and progress from simply providing short-term incentives to securities buyers. Thin financial markets which are thin, as typically found in LDCs tend to be highly

speculative and manipulated by a few big insiders, which creates a comprehensive mistrust by most small savers and even some potential institutional investors, such as those using pension funds. Especially with fast developing countries, it becomes crucial to slowly bring in place and development financial structures that are overseen and regulations by regulatory authorities. With most countries, regulation is gradually loosened according to the development and increase in efficiency of such markets, but on the contrary it is unlikely that complete deregulation will ever be compatible with financially stable growth (especially after the course of events that have followed the sub-prime debt crisis). In this regard Figure 3.2 will discuss the characteristics and the vulnerabilities of Credit Based Systems and Capital Market Based Systems. This will be essential in providing for the framework in understanding the financial reforms being implemented (and many being proposed) in India, through profiling the system.

Figure 3.2 Characteristics and Vulnerabilities of Credit Based and Capital Market Based Systems

Credit Based Systems:
Characteristics Typical of credit-based financial systems are found in LDCs, as they are primarily agricultural oriented economy; the needs for financing are relatively small, and if credit is needed, the producer can always use his/her own land as collateral for borrowing, land is the main physical capital and can be expanded by simple incorporation. Mostly finance is very short term oriented and credit rationing may occur in times of growth; when finance is forthcoming to sustain growth (depending on the rate) the financial position of both firms and banks will become more fragile as the supply and the average maturity of loans made available for investment will be determined by the banks' liquidity preference. Banks will almost certainly prefer short-term loans (say towards the financing of consumption, working capital and/or speculation) to longer term, and hence riskier, investment projects. Financial Institutions (especially banks) because of the liability structure, prefer short-term assets. Moreover, financing the accumulation of physical capital requires increasing the vulnerability of financial institutions. Therefore banks will only accept the risk of financing long-term projects if competition drives them to and if they can mitigate their risk through funding. First, growth depends on additional credit, whatever the existing type of financial structure. Second, if growth is high, only if the marginal propensity to buy placements out of households' savings is equal to one, long-term funds will not be available to fund all existing outstanding debt. Third, if development creates constant excess demand for financing short-term operations (working capital, for instance), financial institutions (especially banks) may have no competitive stimuli to finance long term or to promote funding.
Vulnerabilities: Extremely vulnerable to changes in credit conditions in times of growth, because the weight of speculative funds. If the financing of long-lived assets is supplied mainly through short-term renewable loans, a change in the rate of interest will represent a significant rise in firms' financial expenditures; if firms try to adjust by cutting other expenditures simultaneously, this may set in motion a vicious circle of financial reactions which could reduce effective demand even further. Bank gets the bulk of the money it uses from funds deposited for a short term at the going interest rate. If it lends a firm money for five years, during the period, the depositors may withdraw their funds at which point the bank's reserves drop and it must reduce its loans: in an extreme case it might not be able to pay claims presented to it. Another, potentially more serious, problem may occur should interest rates change in unexpected ways. If the short-term rates go down and the bank has lent long, its margin of profits increases, but if the rates go up, its profit margins are cut or it loses money. This may partly explain why in countries where funding channels did not develop, compensating structures are normally found, such as a strong commitment on the part of private banks or close government intervention - for example the creation of development banks and the use of a regulated selective credit mechanism (good and obvious examples being Germany and Japan). In many LDCs the process of growth and structural change is faster than one can expect the financial structure to develop, especially as regards the capacity to fund ongoing investments. This means that, unless other arrangements exist to overcome the gap between financial and economic development, growth will be constantly constrained by the lack of sources for financing or surges of financial instability.
The Capital Market Based System
Characteristics: The capital-market-based system is one where securities (stocks and bonds) are the main source of long-term funding. There is a wide range of capital and money-market instruments, a

large number of specialized financial institutions offer competing services and prices are determined by the interplay of supply and demand. In credit- based financial systems, on the contrary, the capital market is weak and firms depend heavily on credit for raising finance beyond retained earnings.

This system can be observed in developed countries and in countries where economic growth and structural changes are rapid, including high levels of accumulation in the form of industrial investment, also countries in transition from an agrarian to an industrial urban economy.

Industrialization and urbanization also changes the composition of investment towards sectors with higher capital intensity, larger scales and longer terms of maturation. Where spatial detachment stretches the process of intermediation and creates new financial requirements. In addition, the change in techniques of production may require non-conventional inputs and equipment, which again creates new sources of demand for long-term financing.

To sum up, different financial structures may be viewed as the institutional means of overcoming the problem of financing growth. It seems, however, that the faster the pace of growth and structural change in the productive sector, the more unlikely it will be that investment finance and funding will develop spontaneously.

Postwar experiences of growth in developed countries were biased toward investment spending, and developing capital-market systems especially after 1970. But as mentioned earlier it surely also depends on the economy in question, its characteristics and its needs in developing financial system where funding will be forthcoming to support investment needs.

Vulnerabilities:

Especially in the context of rapidly growing LDCs that are in the process of developing capital market based financial systems the rule is to have a long-term policy in institutional development. As thin financial markets, can be debilitative as they can be highly speculative and manipulated by a few big 'insiders'. This creates a comprehensive mistrust amongst most small savers and can reduce the interest of institutional investors in funding desirable and worthy projects.

The roles of the institutions and the government depend upon the current stage of development of the financial structure. This institutional evolution is not always spontaneous, especially with regard to mechanisms for *funding*. Experiences of successful models and developed countries suggest that the evolution of credit-based financial structure was part of a wider development strategy.

As the financial system broadens, a simplistic monetarist view that the primary role of regulator and the government to "control" the money supply and thereby the economy as a whole is not possible. This can induce the regulator to constrain reserves only inducing innovative bank practices and encourage expansion of "non-bank" sources of finance, as seen with the recent financial crisis gripping the world

Ultimately requiring the government to act as a lender-of-last-resort interventions and even bailouts that validate riskier practices (Minsky 2008, 106). In general indebtedness is major concern that results in budget deficits that add to the public debt; that has resulted in the US's current record of budget deficit of US$1.56 trillion resulting in US' public debt to GDP ratio of 62% (www.livemint.com/2010/02/02212341/A-fiscal-mess-in-the-US.html)

Another characteristic of these economies is the dangers where financial instability and inflation can worsen inequality, supporting Keynes's General Theory which already identified two fundamental flaws of the capitalist system: chronic unemployment and excessive inequality. Minsky added a third: instability is a normal result of modern *financial* capitalism (p. 112, 315).

Securitization allows opportunities in packaging debt through, financial engineering creating collateralized debt obligations (CDOs), but this packaging financial paper that is freed from national boundaries and in times of crisis (through insolvency and illiquidity) can cause a global financial meltdown.

Regulation mainly becomes almost becomes an impossible task, as the rise of the commercial-paper market that allowed firms to bypass commercial banks, could not be regulated by government.

Whereby there are great financial innovations (especially in the past decade) providing for the

greatly expanded availability of credit which then pushed up asset prices. This in turn, not only encouraged further innovation to take advantage of profit opportunities but also fueled a debt frenzy and greater leveraging.

Source: Studart 1995 and Minsky 2008

3.2.3 *Financial Sector Development and Diversification*

Although there is no direct relationship to suggest that financial development is fundamental to growth, but the role of a stable, diversified financial system especially for a growing industrializing economy is slowly being appreciated. The goal of such a system is to intercede between savers to entrepreneurs by transferring funds seeking capital for productive investments. Considerable recent research underscores the importance of financial markets for economic development, where the size of a nation's financial market (the sum of bank assets, equity market capitalization and value of outstanding bonds) is positively and significantly correlated with its level of economic development (Barth, McCarthy, Phumiwasana, & Yago, 2006, p. 11). As this section seeks to expand and reveal that especially these three individual components of a nation's total financial market are positively and significantly correlated with its level of economic development, using the case of India.

Studies suggest that the composition (that is bank assets relative to equity market capitalization plus bonds outstanding) of a nation's financial market, more generally, is not significantly correlated with its level of economic development. But is consistent with the view that banks and capital markets should be viewed as net complements, not substitutes therefore policy is going in the right direction where capital markets are being strengthened, shifting it away from a bank based system. By having both banks and securities markets can provide for a more diversified financial system. Yet, the general view is that while having a securities market cannot fully substitute for a healthy banking sector, it can reduce the pressure on a weakened banking system in time of crisis by providing an alternative source of credit when banks' curtail lending. Table 3.2 below explicitly reveals the global inequality not only in terms of GDP but also in financial market size; the trends are clear. India has a long way in developing the size of its financial markets in order to efficiently and intermediate the needs of saving and investment to eventually provide the rapid growth rates that the subsequent governments are promising.

Table 3.2 Differences in Size and Composition of Financial Markets Around the World, 2003

	World Totals	Percent of total accounted for by:			
		High Income Countries	Middle Income Countries	Low Income Countries	*Asia**
Population	6.3 billion	15.5	47.7	36.8	*44.9*
GDP	$36.4 trillion	80.5	16.4	3.0	*10.2*
Bank Assets	$50.6 trillion	87.2	11.6	1.2	*11.8*
Equity Market Capitalization	$31.9 trillion	91.1	7.9	1.0	*9.1*
International Debt Securities	$11.7 trillion	95.6	3.9	0.5	*3.9*
Domestic Debt Securities	$39.6 trillion	90.9	4.7	0.1	*2.1*

Note: *Asia refers to the ten selected Asian economies—China, Hong Kong, India, Indonesia, Malaysia, Philippines, Singapore, South Korea, Taiwan and Thailand.

Source: Statistical Abstract of the United States, U.S. Census Bureau; *World Development Indicators*, World Bank; *World Economic Outlook and International Financial Statistics*, International Monetary Fund; *Size of World Bond Market Capitalization*, Merrill Lynch; *Quarterly Review: International Banking and Financial Market Developments*, Bank for International Settlements; *Mutual Fund Fact Book*, Investment Company Institute; *Financial Statistics,* Central Bank of China (Taiwan).

The Authors Note: Economies are divided among income groups according to 2003 GNI per capita, calculated using the World Bank Atlas Method. The groups are: low income, US$765 or less; middle income, US$766-US$9,385; and high income, US$9,386 or more.

Source: (Barth, McCarthy, Phumiwasana, & Yago, 2006, p. 13)

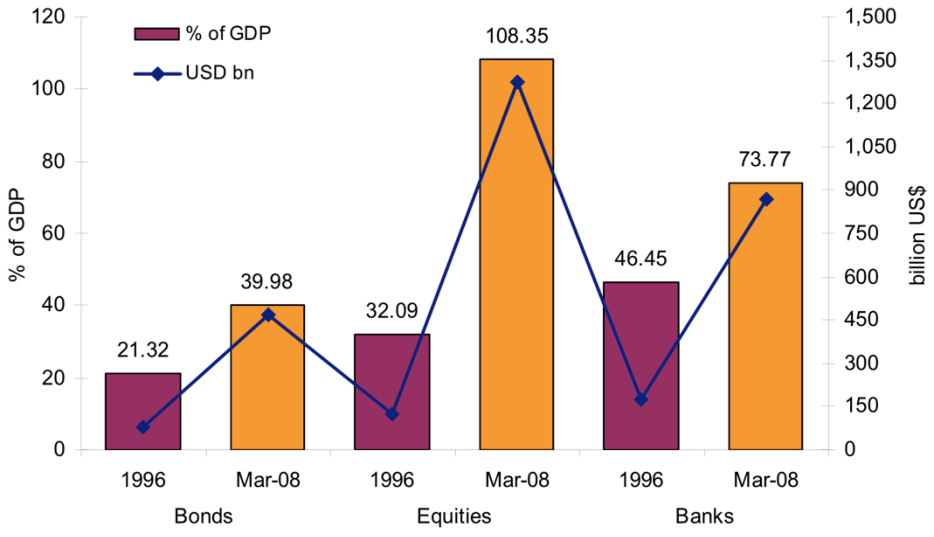
3.3 Indian Financial System Profiling: Key Characteristics

There are innumerable studies and papers that have been calling for the reduction in government interference, most often suggesting that it is a barrier to growth. The call is in other words for a financial sector that would strengthen its market orientation, so that it can allocate capital efficiently and meet the needs of savers. India apart from a large banking sector has recently been able to develop a strong equity market. Although the Bombay Stock Exchange (BSE) along with many of India's venerable banks trace their ancestry to the era of British rule, the financial system has been characterized by excessive government intervention that is sometimes associated with the distortion of capital allocation of capital and not supporting growth. The government has been absorbing a good deal of the country's capital to finance its rural investment priorities and large fiscal deficit, which becomes essential to supporting the larger political economy. Prior to the reforms of 1991, in state control and regulation was even higher; where state-owned banks controlled 90% of bank assets they also channeled high proportions of funds to the government. Interest rates were determined administratively; credit was allocated on the basis of government policy and approval from the RBI was required for individual loans above a certain threshold. Although India had the oldest stock market, capital markets were underdeveloped, and major stock markets acted mainly in the interest of its members, not the investing public. Derivative markets did not exist and comprehensive capital controls meant that companies were unable to bypass domestic controls by borrowing abroad.

But the issue was about capacitating the financial system, not only through building the necessary institutions and regulatory environment that allow for more capital market based system to evolve and support funding for firms that involved in long term projects. As this section will display, this process has been fairly gradual, and this can be understood considering the size of the political economy. Although the major thrust of financial reforms commenced in 1992, in order to develop a corporate sector and expand the already existing bank based credit system, there still requires a lot to be done in developing securities market that would potentially fund large scale and projects with longer gestation. In face the contours of the debt market are already beginning to take shape. The idea of the financial reform by far has been involved in the development of a different range of markets, to ensure so as to not leave the whole task of financial intermediation with banks. The reform process attempted at doing away with regulations in favor of controls based on market forces that is an era where the interest rates are governed more by the market forces of demand and supply and less by centralized supervision.

Slowly, but steadily, the market has been expanding with fresh players and novel instruments. Several measures have added to greater transparency, reduction in transaction costs and have brought the issuances closer to the market levels. As Graph 3-1 suggests India has developed a world-class equities market that developed rapidly in spite of earnest beginnings. The ratio of equity market capitalization to GDP has more than tripled, from 32.1% in 1996 while the banking sector expanded to 74% of GDP from 46.5% in 1996. The lagging sector however has been the development of government and corporate bond markets, which although doubled but only reached to about 40.0% of GDP. A starker characteristic of the Indian government market is the fact that bond market is by far composed of government bonds, which accounts for about 90% of the entire bond market at about 36% of GDP as of March 2008. But the financial reforms have been based on financial liberalization in order to develop a more diversified and competitive financial system that would improve resource allocation and efficiency through developing instruments, financial viability, and institutional strengthening.

Figure 3.3 Financial Sector Development in India



Sources: Data for bonds sourced from Bank for International Settlements; equities from World Federation of Exchanges; and bank credit from CEIC.

Source: ADB 2008

But after the mid-1990s, the Indian financial system was progressively liberalized, deregulated and more exposed to international financial markets. This shift in financial policy has been accompanying strong economic growth, market robustness, and a considerable increase in efficiency. This has been characterized by the development of institutions (regulatory agencies, regulations through legislations), improving efficiency in reducing transaction costs through associated payment and settlement system, and gradual integration with financial markets (including allowing foreign banks and Foreign Institutional Invertors (FIIs). The ultimate goal eventually to develop a diversified, efficient, and competitive financial system, which would ultimately improve the efficiency of resource allocation through operational flexibility, enhanced financial viability, and institutional strengthening. Table 3.3 also depicts the recent data on the domestic financial markets published by the RBI. While Table 3.4 provides the major general developments in the financial market that occurred during the post reform period, although sub-sector specific regulations will be outlined in the respective sections to follow. These developments also continued in the context of 1997/98 Asian financial crisis and its contagion effects further spurred Indian authorities to strengthen the domestic financial system. So although financial liberalization was being carried out, there were also reforms that were put into place based on principles such as mitigate risks in the financial system; increasing allocation efficiency of resources to the real sector; and gradually opening the external sector and making the financial system competitive globally.

Table 3.3 Domestic Financial Markets at a Glance

Year/ Month	Call Money		Government Securities		Foreign Exchange			Liquidity Management		Equity			
	Average Daily Turnover (Rs. crore)	Average Call Rates* (Per cent)	Average Turnover in Govt. Securities+ (Rs. crore)	Average 10-Year Yield@ (Per cent)	Average Daily Inter-bank Turnover (US $ million)	Average Exchange Rate (Rs. per US $)	RBI's Net Foreign Currency Sales (-)/ Purchases (+) (US $ million)	Average MSS Out-standing# (Rs. crore)	Average Daily Reverse Repo (LAF) Out-standing (Rs. crore)	Average Daily BSE Turnover (Rs. crore)	Average Daily NSE Turnover (Rs. crore)	Average BSE Sensex**	Average S&P CNX Nifty**
1	2	3	4	5	6	7	8	9	10	11	12	13	14
2006-07	**21,725**	**7.22**	**4,863**	**7.78**	**18,540**	**45.28**	**26,824 ##**	**37,698**	**21,973**	**3,866**	**7,812**	**12,277**	**3,572**
2007-08	**21,393**	**6.07**	**8,104**	**7.91**	**34,044**	**40.24**	**78,203 ##**	**1,28,684**	**4,677**	**6,275**	**14,148**	**16,569**	**4,897**
2008-09 P	**22,436**	**7.06**	**7,175**	**7.56**	**–**	**45.92**	**–**	**1,48,889**	**2,885**	**4,498**	**11,212**	**12,366**	**3,731**
Apr 2008	19,516	6.11	6,657	8.10	37,580	40.02	4,325	1,70,726	26,359	5,773	13,561	16,291	4,902
May 2008	19,481	6.62	6,780	8.04	32,287	42.13	148	1,75,565	11,841	6,084	13,896	16,946	5,029
Jun 2008	21,707	7.75	6,835	8.43	38,330	42.82	-5,229	1,74,433	-8,622	5,410	12,592	14,997	4,464
Jul 2008	24,736	8.76	5,474	9.18	37,173	42.84	-6,320	1,72,169	-27,961	5,388	12,862	13,716	4,125
Aug 2008	23,408	9.1	7,498	9.06	38,388	42.94	1,210	1,71,944	-22,560	4,996	11,713	14,722	4,417
Sep 2008	23,379	10.52	10,418	8.45	44,700	45.56	-3,784	1,75,666	-42,591	5,147	12,489	13,943	4,207
Oct 2008	28,995	9.9	4,321	7.85	36,999	48.66	-18,666	1,69,123	-45,612	3,911	10,810	10,550	3,210
Nov 2008	21,812	7.57	5,866	7.41	31,322	49.00	-3,101	1,47,648	-8,017	3,539	9,618	9,454	2,835
Dec.2008	21,641	5.92	11,451	5.88	34,874	48.63	-318	1,24,848	22,294	3,851	95,928	9,514	2,896
Jan 2009	18,496	4.18	9,568	5.84	27,171P	48.83	-29	1,13,535	45,474	3,526	9,559	9,350	2,854
Feb 2009	22,241	4.16	5,916	5.98	24,840P	49.26	230	1,02,934	50,649	2,856	7,887	9,188	2,819
March 2009P	23,818	4.17	5,322	6.56	–	51.23	–	88,077	33,360	3,488	10,140	8,995	2,802

* : Average of daily weighted call money borrowing rates.
+ : Average of daily outright turnover in Central Government dated securities.
@ : Average of daily closing rates.
# : Average of weekly outstanding MSS.
** : Average of daily closing indices.
: Cumulative for the financial year.
LAF : Liquidity Adjustment Facility.
BSE : Bombay Stock Exchange Limited
MSS : Market Stabilisation Scheme.
NSE : National Stock Exchange of India Limited .
P : Provisional
– : Not available.
Note : In column 10, (-) indicates injection of liquidity, while (+) indicates absorption of liquidity.

Cited in: RBI 2009

Table 3.4 Financial Regulatory Agencies and Regulatory Legislations in India

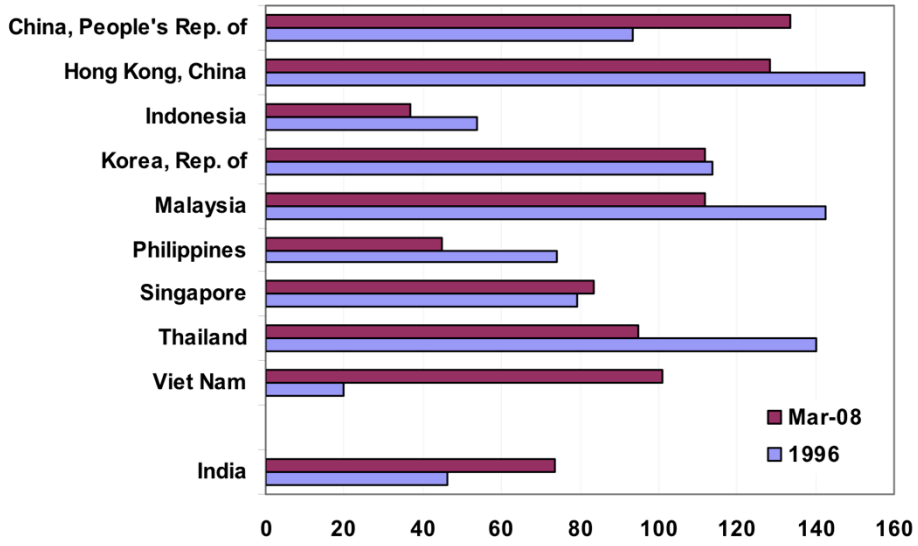
Industry Sector	Year Opened	Legislation	Regulator
Banking, and Government Securities Market, and Financial Market	1934	Reserve Bank of India Act, 1934. RBI, originally privately owned, nationalized since 1949	
Committee on the Financial System	1991	Committee on the Financial System (Narasimham Committee) that was published in 1998 Committee on Banking Sector Reforms (later setup in 1998)	
Capital Market and Securities	1992	Securities and Exchange Board of India Act, 1992 Securities and Exchange Board of India (SEBI)	
Board for Financial Supervision (BFS)	1994	BFS introduces an Off-site Monitoring and Surveillance System (OSMOS), later it also introduced the CAMELS (Capital Adequacy, Asset Quality, Management Earnings, Liquidity and Systems) and CACS (Capital Adequacy, Asset Quality, Compliance and Systems) for rating of banks to help identify the banks, which need special supervisory attention BFS set up oversee Capital to Risk Weighted Asset ratio (CRAR) of 8% by March 1995.	
Insurance	1999	IRDA Act, 1999 Insurance Regulatory and Development Authority	
Commodity Markets	2000	Forward Markets Commission is the regulator for Commodity markets that is part of the Ministry of Consumer Affairs and Food Trading in derivatives and three new commodity markets were created in 2000, based on National Stock Exchange (NSE) architecture.	
Pension	2003	Pension Fund Regulatory and Development Authority (PFRDA) Bill, 2005 still awaits approval of Parliament Interim pension fund regulator: PFRDA	

Source: Source: Compiled by the Author, from relevant websites including RBI, SEBI, BFS and livemint.com accessed on 25th May 2010

3.4 The Banking Sector

India was known to be a bank-dominated market, as it has been common in the region (comparatively lower than the rest of East Asia refer to Figure 3.4), and the relative importance of bank assets as a percentage of GDP has continued to grow. The reason for the increase is partly because the banking penetration has deepened with financial liberalization, and also in order to finance government deficits. But the size of the Banking sector still has a long way to go, to develop the sector to reach East Asian standards, although there is a reverse trend as financial markets diversify and the banking sector starts contracting relative to other sectors. But reform of the banking system has been gradual as with Indian's economic reforms, and prudential control; recapitalization of public sector banks and the introduction of greater competition has been the priority. A BFS within the Reserve Bank was set up as the control system in 1994 to provide supervision, and subsequently the rules governing the recognition of bad loans have been substantially tightened. Regulatory norms have been reformed to converge with international best practices, as Figure 3.4 suggests.

Figure 3.4 Relative Size of India's Banking Assets (% of GDP)



Sources: AsianBondsOnline; Reserve Bank of India; *International Financial Statistics,* International Monetary Fund; and CEIC.

Source: ADB 2008

Competition was also gradually introduced into the banking system, initially through the creation of dozen private Indian banks, eventually allowing foreign banks to enter the market (where there 30 of them operating by end 2006). When prudential reforms were undertaken, bank interest rates were deregulated, and by 2007 controls only remained in four areas – saving deposit accounts, small loans in priority areas, export credits and non-resident transferable rupee deposits. The tighter regulatory structure and the increased competition also resulted in greater pressure on bank managements to consider the profitability of their operations. As a result, the net revenue of banks has improved. In particular, public sector banks increased the ratio of their net profit to assets from 0.57% in the year to March 1997 to 0.82% in the year ending March 2006, their profitability are growing in line with the new private sector banks (OECD, 2007, p. 148). However, a problem that still persists is the directed lending that, is imposed by the government on public sector banks.

Table 3.5 Legislation and Important Developments in the Banking Sector

Year & Legislations	Developments and Details:
1934 Reserve Bank of India Act, 1934	Banking, and Financial Regulator: RBI, originally privately owned, nationalized since 1949
1994 Setting up of the Board for Financial Supervision	Board set up under the aegis of the RBI to be the apex supervisory authority for commercial banks, financial institutions, urban banks and Non-banking Financial Companies (NBFCs). Consistent with international practice, the Board's focus is on offsite and on-site inspections and on banks' internal control systems.
1994 – 1997 Series of Interest Rate Deregulation (and deposit rates fully deregulated in 1997)	To Enable better price discovery and imparting greater efficiency in the process of resource allocation. Interest Rates Deregulated, but controls still remain—savings deposit accounts, small loans in priority areas, export credits, and nonresident transferable rupee deposits.
2002 Securitization and of Financial Assets and Enforcement of Security Interest Act, (Sarfesi) and Secured Lending Law	Sarfesi act empowers Banks / Financial Institutions to recover their non-performing assets without the intervention of the Court. The Act provides three alternative methods for recovery of non-performing assets, without the intervention of the Court: • Securitisation • Asset Reconstruction • Enforcement of Security
2003 Statutory Liquidity Ratio (SLR) Reform	The reduction in the lending requirement to government from 63.5% to 30.0% of bank assets
2006 Number of Non-state Banks	12 Domestic Private Banks and 30 Foreign Banks started operation
2006 RBI withdraws from lending to the Government	The RBI ceases to participate in the primary market for government securities and following FRBM Act (2003) the RBI no longer lends to the government.
2006 Amendment of Two Acts dealing with CRR and SLR. Where earlier in the1999 CRR was reduced from 15 to 10 % and SLR from 38.5 to 25%	Removal of the legal ceiling on SLR and abolishment of limits on both the floor and ceiling of the cash reserve ratio (CRR), allowing RBI to alter these ratios depending on prevailing monetary and economic conditions. Trial was done in 2003. The CRR raised in 2007 to counter the likely inflationary consequences in build up of foreign exchange reserves.
2009	Basel II regulatory system to be implemented

Source: Compiled by the Author, from relevant websites and livemint.com

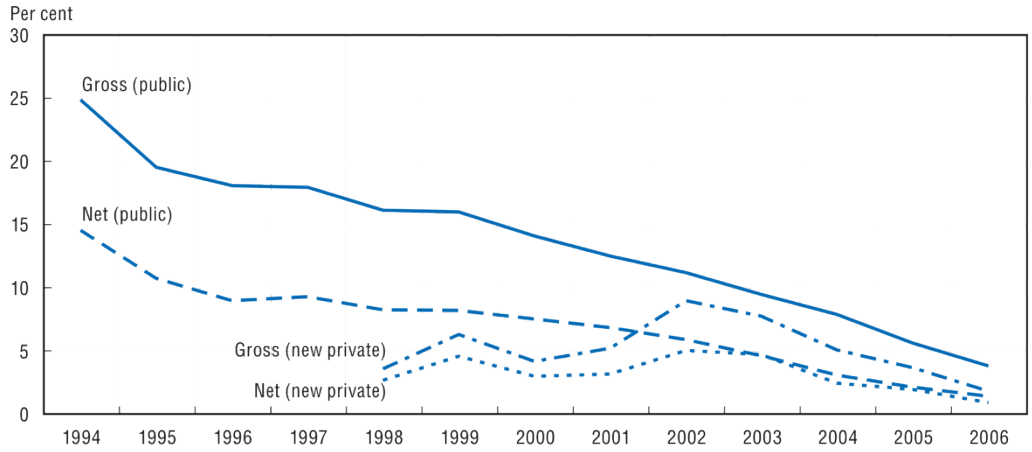
However, public banks still have a somewhat higher incidence of bad loans in priority areas, especially in lending directed credit programs including agriculture. International experience suggests that directed credits in the long term suffers from abuse and misuse of preferential funds for non-priority purposes resulting in a decline in financial discipline including low repayment rates that also end up indirectly causing an increase in the cost of funds to non-preferential borrowers. Directed lending or funding results in banks acting as a quasi-fiscal body that provides virtual subsidies to selected segments of the economy which do not appear on the general government balance sheets, obstructing the natural function of banks as autonomous profit-maximizing entities. Other countries that continue this practice are Nepal, Pakistan and the Philippines; China, the Kyrgyz Republic, and Vietnam have similar programs (OECD, 2007, p. 149).

Committee on the Financial System (Narasimham Committee), as early as in 1991, had already called for the phasing out of the credit programs as although they were being used for equity purposes in assisting disadvantaged classes. According to the governments strategy, it seems that directed lending to agriculture and small scale industries has not been provided with adequate credit, although programs have been

set up for almost the last four decades. These are surely issues of a larger political economy, and vested interests in capturing political support. But as a result of the reforms, government funds were used to recapitalize banks through the issue of bonds to the banks. By 2001, bonds amounting to INR 225 billion (nearly 1% of GDP in fiscal year 2003) were issued. Another characteristic in India was that bad loans were not sold to an asset management company, and banks were expected to gradually use their income and capital to provision the loans. Since 1994, when bad loans represented one-quarter of the total advances of public banks, this figure has been considerably reduced.

By 2006, the bad loan situation of Indian banks was comparable to other high performing countries across the world and the difference in bad loans of public banks and the new private banks was almost completely eliminated. But this was also an advantage for newer private sector banks as they started with a clean slate, as the older ones private and public banks needed to perform to bring down their indebtedness. Apart from the priority lending regulations, banks were also subject both to CRR (6.5% of assets since May 2007) and SLR that requires 25% of their liabilities to be kept in specified public sector securities. In the macro-perspective sectoral allocation accounted for 59% of bank assets being determined by regulation. In the early part of this decade, the SLR was not a constraint on the lending behavior of the banks. In spite of effort to decrease the SLR and new regulations being developed to bring it down, public sector banks in general held a higher than required proportion of their assets in such investments, comparing to new private banks. But in general the gross net non-performing loans for public and private sector banks as (% of advances) has greatly reduced.

Figure 3.5 Development of Gross and Net Non-Performing Loans for Public and New Private Banks (as % of advances)



Source: 1993-2000 Muniappan (2002), 2001-06 Reserve Bank of India, *Trend and Progress of Banking in India.*

Source: OECD 2007

Apart from these restrictions, banks were also to consult with the Reserve Bank about the structure of their branches. For example, all specific proposals relating to opening, closing and shifting of all categories of branches, including off-site ATMs, are required to be included in their annual plan that would be reviewed by the Reserve Bank once it was submitted. The RBI had the final say in the decision on whether or not to allow a new branch to open depends on the bank's performance in a number of areas such as how banks price their products; actual lending to priority sectors; and whether the bank is committed to providing basic banking services. Finally in 2005, individual authorization has been replaced by aggregate approval allowing a degree of

flexibility for banks to decide on opening and closing of branches and upgrading facilities, although the basic criteria for approving plans continues to rest with the RBI.

In terms of the corporate governance, banks are neither controlled by the Companies Act nor by the stock market regulator (SEBI) for listed banks. The legislations under the Bank Regulation Act actually override any provisions made for stock market listing or by the Companies Act. At first, shareholders owning more than 10% of the equity of a bank have their voting rights capped at 10% although this was relaxed through an amendment Act in May 2005 in order to remove this restriction but the bill had not been passed by Parliament. For public sector banks, the limit on voting rights was set at 1% until 1994 when it was raised to 10% and this ceiling still remains. Foreign shareholders are still limited only 20% ownership of public banks. They can own up to 74% of private banks but their voting rights remain capped at 10%. Another Act passed in 2006 ended the direction that Reserve Bank was obliged to place one director on the board of every public bank.

In this regard the RBI, although being the regulator of the entire financial market (including the banking sector),has been so far-flung and has exceeded that of any other central bank in other countries. This automatically led to a number of possible conflicts that exist and are slowly being resolved:

- The Reserve Bank lends directly to the government and is the government's investment banker, arranging sales of government debt. It is also the banker for state governments, under the authority of the RBI Act.

- It is the owner of several financial institutions, including the largest commercial bank in the country, as well as the regulator of banks. As to the ownership of banks, the government has already suggested that the Ministry of Finance acquire the RBI's majority holding in the State Bank of India.

- Its holdings in the National Agricultural Bank and the National Housing Bank may be acquired at a later date. These changes will reduce any possible conflict of interest between its ownership and regulatory functions. As announced in the 2007-08 budget speech, a new debt management agency is proposed to be created in the Ministry of Finance.

- The passage of Fiscal Responsibility Act (FRBM 2003) forbade the Reserve Bank to lend to the government; although it still continues to manage the debt of the central government by issuing new debt, as mandated by law. To this end it is also largely responsible for government bonds as it continues to be the owner, manager and regulator of the government securities market.

- It is also responsible for foreign exchange controls and managing the regulations in the foreign exchange market and regulates FIIs

- It no longer appoints directors to the boards of public banks but is responsible for undertaking due diligence process prior to their nomination by the government.

Apart from the developments mentioned in the table above the independent BFS under the aegis of the Reserve Bank is the apex supervisory authority for commercial banks, financial institutions, urban banks and Non Bank Financial Corporations. Consistent with international practice, the Board's focus is on offsite and on-site inspections and on banks' internal control systems:

Where offsite surveillance has been strengthened through control returns, role of statutory auditors has been emphasized with increased internal control through strengthening of the internal audit function. Significant progress has been made in implementation of the Core Principles for Effective Banking Supervision. The supervisory rating system under CAMELS has been established, coupled with a move towards risk-based supervision. Consolidated supervision of financial conglomerates

has since been introduced with bi-annual discussions with the financial conglomerates. There have also been initiatives aimed at strengthening corporate governance through enhanced due diligence on important shareholders, and fit and proper tests for directors.

A scheme of Prompt Corrective Action (PCA) is in place for attending to banks showing steady deterioration in financial health. Three financial indicators, viz. capital to risk-weighted assets ratio (CRAR), net non-performing assets (net NPA) and Return on Assets (RoA) have been identified with specific threshold limits. When the indicators fall below the threshold level (CRAR, RoA) or go above it (net NPAs), the PCA scheme envisages certain structured/discretionary actions to be taken by the regulator. The structured actions in the case of CRAR falling below the trigger point may include, among other things, submission and implementation of a capital restoration plan, restriction on expansion of risk weighted assets, restriction on entering into new lines of business, reducing/skipping dividend payments, and requirement for recapitalization. The structured actions in the case of RoA falling below the trigger level may include, among other things, restriction on accessing/renewing costly deposits and CDs, a requirement to take steps to increase fee-based income and to contain administrative expenses, not to enter new lines of business, imposition of restrictions on borrowings from the inter bank market, and so on.

In the case of increasing net NPAs, structured actions will include, among other things, undertaking a special drive to reduce the stock of NPAs and containing the generation of fresh NPAs, reviewing the loan policy of the bank, taking steps to upgrade credit appraisal skills and systems and to strengthen follow-up of advances, including a loan review mechanism for large loans, following up suit- filed, setting up credit risk management procedures in reducing loan concentration, and so on. Other discretionary actions may also include restrictions on capital expenditure, expansion in staff, and increase of stake in subsidiaries. The Reserve Bank with the government may take steps to change promoters or ownership and may even take steps to merge/amalgamate/liquidate the bank or impose a moratorium on it if its position does not improve within an agreed period.

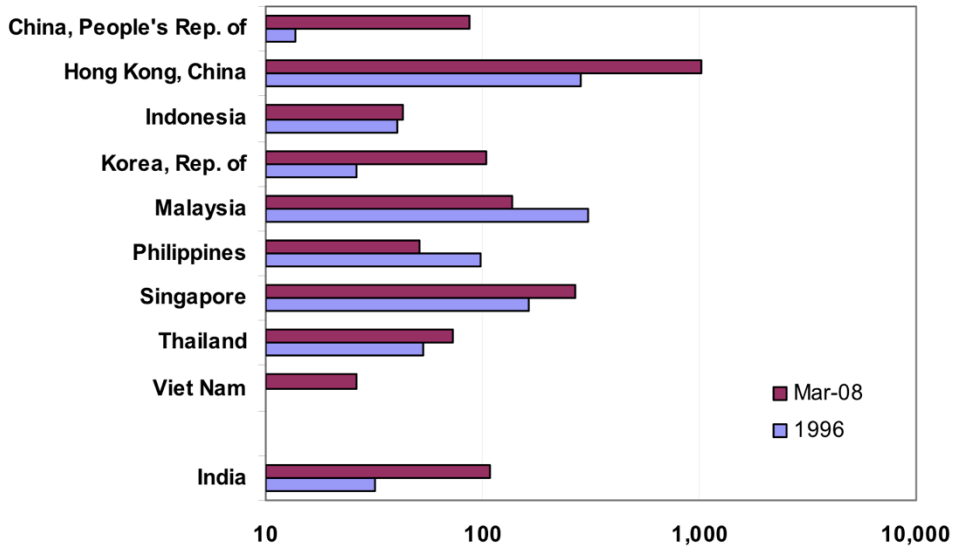
3.5 Equity Markets

Apart from setting up a new NSE the post reform period also saw the drastic change to the equity markets through a new regulatory authority for capital markets the SEBI in 1992. Prior to this new regulator, the regulatory regime, where significant elements of the capital markets was again under the control of the RBI. The regulator has helped establish corporate governance rules for listed companies that are above average for emerging markets (OECD, 2007, p. 151). However, enforcement of the rules can sometimes be held up by delays in the legal system. The capital market regulator does not, however, have full reach over major financial markets. With the strong growth in equity markets, at a time when India's GDP has itself been increasing more rapidly. The size of the equity market is similar in terms of % of GDP to Korea's and relatively larger than other emerging East Asia equity markets as Figure 3.6 suggests. Equity trading declined in the early 2000s, when world equity markets were falling and Indian government debt was rising strongly, but has risen since. This trend repeated where trading declined to the lowest in years recently with the global meltdown, but is showing strong signs of recovery again.

Equity markets have grown remarkably since the early 1990s and are now amongst the largest in the world in terms of transactions and have costs comparable with other major exchanges. The major determinant of this evolution, as mentioned above was the setting up of the NSE in 1994, a competitor to the BSE, both located in

Mumbai. This exchange was created in response to the poor performance BSE that was mutually owned stock exchange. Its founding shareholders were a number of public development banks (including one that founded the largest new private bank), government financial institutions and a private bank. The new exchange enabled participants from across the country to trade in one market. The new exchange was one of the first stock exchanges in the world to have a corporate structure. It rapidly became the largest market in India and, the third largest exchange in the world, measured by the number of transactions. It now has foreign shareholders (New York Stock Exchange and various banks) with up to a maximum of 26% allowed by foreign direct investment (FDI) regulations. Major development and regulations are highlighted in Table 3-6.

Figure 3.6 Equity Market Capitalization (% of GDP)



Sources: AsianBondsOnline and World Federation of Exchanges.

Source: ADB 200

Table 3.6 Legislation and Important Developments in the Equity Markets

Year and Legislations	Development and Details	
1956 BSE set up under the Securities Contracts (Regulation) Act, later became the BSE Limited (in 2005 from an Association of Persons (AoP).	BSE is the oldest stock exchange in Asia, and the first stock exchange in India that was established as originally as the "The Native Share & Stock Brokers' Association" in 1875. Its founding shareholders were a number of public development banks (including one that founded the largest new private bank), government financial institutions and a private bank. BSE Sensex index developed in 1986, switched to Online trading (BOLT), an electronic trading system in 1995, and became a corporate entity in 2005.	
1992 SEBI Act	Capital Market and Securities Regulator: Securities and Exchange Board of India (SEBI)	
Credit Rating Agencies (CRAs): since 1991	CRAs	Ownership/Status
	CRISIL	Standard & Poors is a major shareholder 61%
	CARE	Owned by 3 major Indian banks (Industrial Development Bank Of India Ltd. (IDBI), SBI, Canara)
	ICRA	(Formerly Investment Information and Credit Rating Agency of India Limited) is a Public Limited Company (with its shares listed on the BSE and the National Stock Exchange) and Moody's is a major shareholder
	Duff and Phelps	Indian Subsidiary
	Fitch	Indian Subsidiary
1994 Setting up of NSE	NSE was Set up as a competitor in response to the poor performance of the existing mutually owned stock exchange BSE both located in Mumbai: NSE now has foreign shareholders (New York Stock Exchange and various banks) up to the maximum (26%) allowed by FDI regulations	
1996 Enactment of Depositories Act	Law passed allowed for the creation of the National Securities Depository Ltd. (NSDL) for holding all stocks in demat form	
2005, the RBI introduced its Negotiated Dealing System–Order Matching Segment (NDS-OM).	August This is a screen-based anonymous trading and reporting platform enabling electronic bidding in primary auctions and disseminates trading information with a minimum time lag. NDS-OM has had considerable success and has taken a dominant share of government securities market trading.	

Source: Compiled by the Author, from relevant websites and livemint.com

Costs were also reduced with the introduction of new clearing and settlement institutions. An integral part of the new architecture was the creation of a centralized counterparty for transactions, established as a subsidiary of the National Stock Exchange and resulted in the elimination of counter-party risk in the market. At the same time, a law passed in 1996 allowed the creation of a new depository institution (NSDL) for holding all stocks in de-mat (dematerialized) form. This greatly reduced the incidence of settlement risk. Overall, these reforms created a national market in shares, eliminating price differences across the country. Overall, transactions costs were reduced by a factor of thirteen between 1993 and 2004, leading to a marked rise in turnover(OECD, 2007, p. 153). Since 2004, the liquidity of the market has further improved with the impact cost of a trade in a major stock falling to 0.07%, comparable to that found in major OECD stock markets.

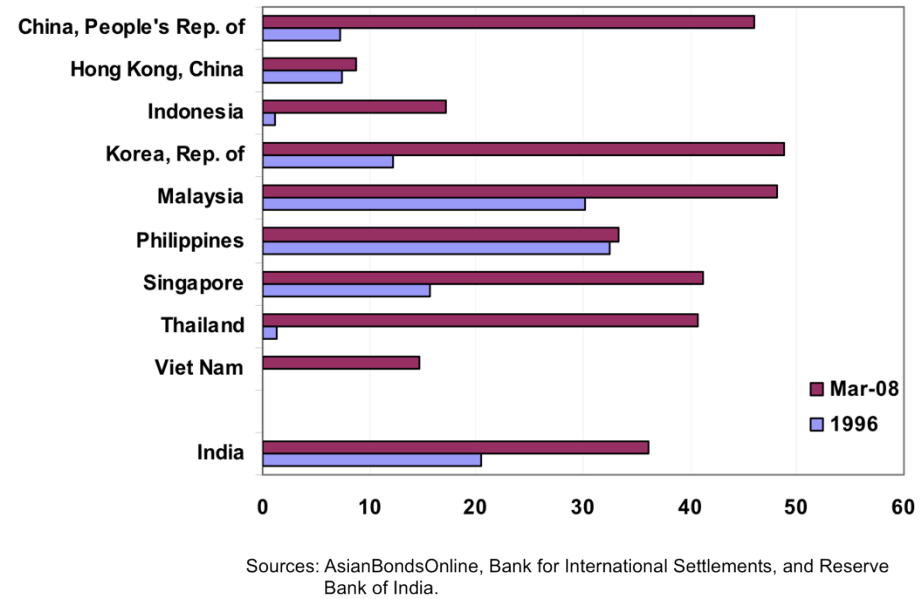
3.6 Bond Markets

3.6.1 *The Government Bond Market*

Prior to the reform period there hardly existed a government securities market, as money was collected and lent according to Plan, according to the governments planning strategy. In order to keep the cost of government borrowing as low as possible, when planning went off-course the government would just send word to its banker. As in the central bank would make a few phone calls to the heads of banks and bonds were issued and the money arranged. Under this circumstance there was no government securities market as it lacked the institutional infrastructure and was inefficient. As there was no need for any justification for bond issue, a Government of India (GOI) bond market did not use trading on an exchange. Since it only featured bilateral negotiation and transaction between dealers imposed counterparty credit risk on participants, there was no market with a price-time priority. Until the reform period the government debt market only consisted of a group of securities with a group of homogeneous credit risks, and there was no way to evaluate their performance, and public sector banks and the government just dealt with each other.

But ever since then the bond market has grown steadily ever since then, especially the government bonds which were largely issued in order to finance the fiscal deficit. The size in fact is comparable to many government bond markets in emerging East Asia at 36% of GDP, the Indian government debt market compares well with the markets of its neighbors in 2008 (refer to Figure 3-7). In absolute terms, however, given India's greater overall size, the Indian government bond market is considerably larger than most other EEA markets. The need to finance a large fiscal deficit has stimulated issuance and growth of the government bond market. Since 1992, deficit finance has relied increasingly on borrowing from the market rather than the previous policy of monetizing the deficit. The government market comprises approximately 104 issues with a total nominal value of about US$364 billion (ADB, 2008, p. 6).

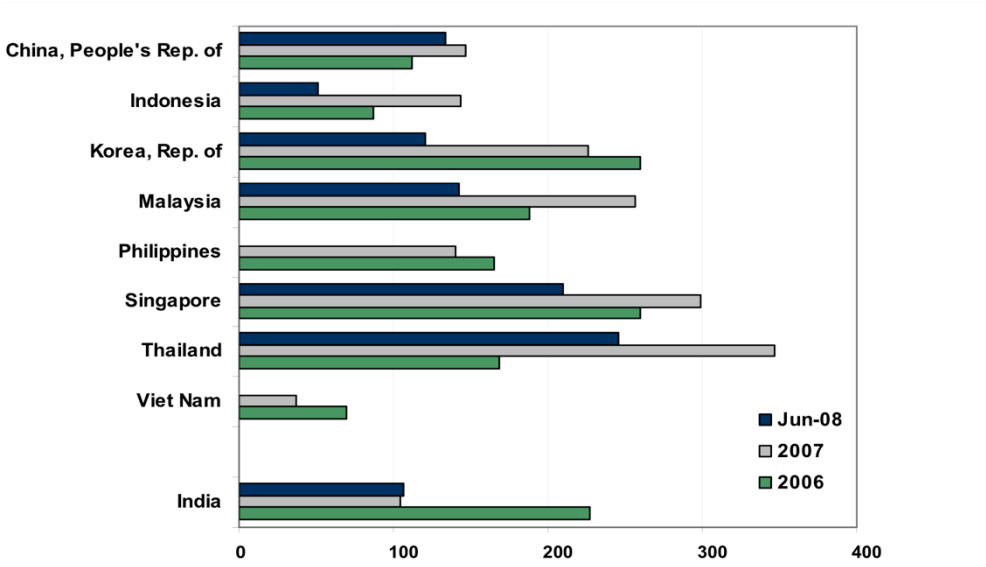
Figure 3.7 Relative Size of India's Government Bond Market (% of GDP)



Sources: AsianBondsOnline, Bank for International Settlements, and Reserve Bank of India.

Source: ADB 2008

Figure 3.8 India and EEA Government Securities Turnover (% Average Outstanding)



Data for India for June 2008 covers January to March 2008 only.

Sources: AsianBondsOnline, Reserve Bank of India and Clearing Corporation of India Ltd.

Source: ADB 2008

Government bond turnover has been fell from the peak reached in 2003 but has since been recovering on a strong but volatile course also swaying the turnover of repurchase agreements (repo). Repos have continued to increase, as more borrowers use them as a financing tool and had has now become considerably larger than government bond market turnover by investors. This trend implies the illiquidity of the government bond market, where liquidity is clearly concentrated in a few bonds and does not extend along the length of the yield curve of the previous 30-year spectrum. The liquidity was observed to be highly concentrated in 10-year issues (where the ADB (2008) suggests that the bonds maturing in 2016–17 comprised 50% of all trading) and 5-year issues (bonds maturing in 2010–12 were also at 20% of all trading). Looking at this in perspective where between 1990-91 and 1998-99 there has been a ten-fold increase in G-Secs registered in the Primary market. The fall in RBI's participation, as its absorption level from 45.90% in 1992-93 to 0.74% in 1994-95 also widened the market up slowly opening up to retail investors.

These trends suggest one thing, although there has been significant improvements in the primary market, the secondary market is dominated by a few players that operate on a strategy of holding till maturity. This characteristic has been a continuation of the so-called pre-1992 "telephone market" that prevents information dissemination (limiting price discover) and eventually low retail participation in G-Secs (Government Securities). The way in which these challenges can be overcome are by widening the investor base for Government securities among retail investors through increasing awareness and developing the infrastructure to deepen the market so that the exit routes are also clear. Current government bonds are fixed-coupon with maturities from 1 to 30 years. The RBI has experimented by floating different type of bonds over the years including (i) zero- coupon bonds; (ii) capital-indexed bonds (inflation-linked principal); and (iii) floating-rate bonds. After all these initiative failed RBI is in the process of develop a market for Separate Trading of Registered Interest

and Principal of Securities (STRIPS). The Table below illustrates the important legislations and regulatory measures taken since the reform period.

Table 3.7 Legislation and Important Developments in the Bond Market

Year and Legislations	Developments and Details
1992 Auction system for sale of dated government securities.	This replaced the previous system where issues were allocated to investors—largely banks and state-owned investment institutions. Also signaled the end of the era of administered interest rates. RBI was the Regulator of G-Sec bond market.
Computerization of the SGL and implementation of a 'delivery versus payment' (DvP) system.	Zero Coupon Bonds and Capital Indexed Bonds introduced
1996 Primary Dealers system Wholesale Debt Market (WDM) Dematerialized forms of securities in G-Secs	Primary dealers could be independent or linked to banks, but they have acquired a major share of the GOI bond market. WDM segment was set up at NSE FIIs with 100% Debt Schemes were allowed to invest in C-Sec's and T-Bills while other FIIs were allowed 30% investment in these instruments. DMat of G-Secs done through the SGL and Constituents SGL accounts.
2000 Finance Bill	The secondary market for corporate did receive a boost with the waiver on stamp duty payment on transfer of debt securities, as long as they are dematerialized debentures, in the Finance Bill 2000.
High Level Committee on Corporate Bonds and Securitisation (Chairman: Dr. R.H. Patil)	The recommendations of the group have been taken up for implementation. The Union Budget, 2008-09 has abolished tax deduction at source (TDS) on corporate bonds. The trading platforms are in operation both at the BSE and the NSE since 2007. The Fixed Income Money Market and Derivatives Association of India (FIMMDA) set up also in 2007 as the trade reporting platform for capturing the over-the-counter (OTC) trade data.

Source: Compiled by the Author from relevant websites and livemint.com

3.6.2 *Corporate Bond Market*

Although government bond market has grown over the reform period, the corporate bond market, however, is much less developed in comparison to the emerging East Asian (EEA) economies. Over the reform period the office of the Controller of Capital Issues (CCI) was abolished (it formerly administered control over capital issues), which meant that companies were free to price their equity issues as per the market appetite. As during the pre-reform period, companies wanting to make any change in they're capital structures had to obtain prior approval from the CCI. While examining such proposals, the CCI acted as the last checkpoint to ensure that the company had obtained al government and mandatory clearances, such and industrial licenses, approval from financial institutions, and so on. This led to a slew of primary issue of equity and the relative attractiveness of issue of debt yielded way to equities. Several relaxations in regulations post 1992 have encouraged Indian corporations to raise debt from overseas capital markets leading to further shunning of the domestic debt market by creditworthy issuers. Therefore, the corporate debt market in India has continued to be again dominated by the Public Sector Undertaking's (PSU's).

As Table 3.8 suggests, the corporate bond market at 3.9% of GDP is similar to the size of markets in countries where corporate finance is not well developed (Philippines and Indonesia) or where state-ownership remains dominant (as in PRC or Viet Nam). Even in absolute terms India's corporate bond market is minuscule in relation to its economic size. Although Asia's corporate bond markets are relatively smaller than the government bond markets, India is only similar with China, Vietnam and to some extent Indonesia; where the corporate bond market is just over one tenth of the government's share. Though the businesses in different countries choose to rely on different modes of financing, either equity or bank financing. But India has corporate bond market is believed to be miniscule compared to its size, where it just a little larger than that Thailand, and on top of that private placements dominates the market.

Table 3.8 India and EEA Bond Markets (US$ Billion), March 2008

	Government	Corporate	Total
China, People's Rep. of	1,712.93	175.16	1,888.10
Hong Kong, China	18.41	74.96	93.37
Indonesia	77.23	9.13	86.36
Korea, Rep. of	450.49	570.48	1,020.97
Malaysia	101.30	79.00	180.30
Philippines	54.50	5.68	60.17
Singapore	74.93	55.87	130.80
Thailand	112.31	44.00	156.31
Viet Nam	10.76	1.56	12.32
India	423.97	45.79	469.76

Sources: AsianBondsOnline, Bank for International Settlements, and Reserve Bank of India.

Source: ABD 2008

It was not until 2007 when the SEBI launched initiatives to ensure more comprehensive reporting of the OTC for corporate bonds, under clearing entities such as banks, Stock Holding Corporation of India Ltd. (SHCIL) and CCIL. According to ADB (2008) by late 2008 the volumes were at 140 transactions amounting to about US$80 million per day. But as corporate bond markets worldwide are typically illiquid theoretically speaking a more liquid market is supposed to eventually contribute to lower costs of capital for issuers. India's corporate turnover ratio was at 70% in 2007, which was high compared to other EEA corporate bond markets. The subscribers to corporate bonds are mainly mutual funds, insurance companies and pension funds. Table 3.9 suggests that comparing Government and Corporate bonds is changing with reducing spreads, and corporate bonds being less volatile.

Table 3.9 Recent Performance of Government and Corporate Bonds

During the first half of 2009-10: the spread between the 10-year gilt and the 10-year corporate bond was 175 basis points		
	Government Bonds (G-Secs)	Corporate Bonds
Interest Rate:	9	7
Volatility:	8.25-8.75	6.75-7.51
Source: www.business-standard.com October 16, 2009		

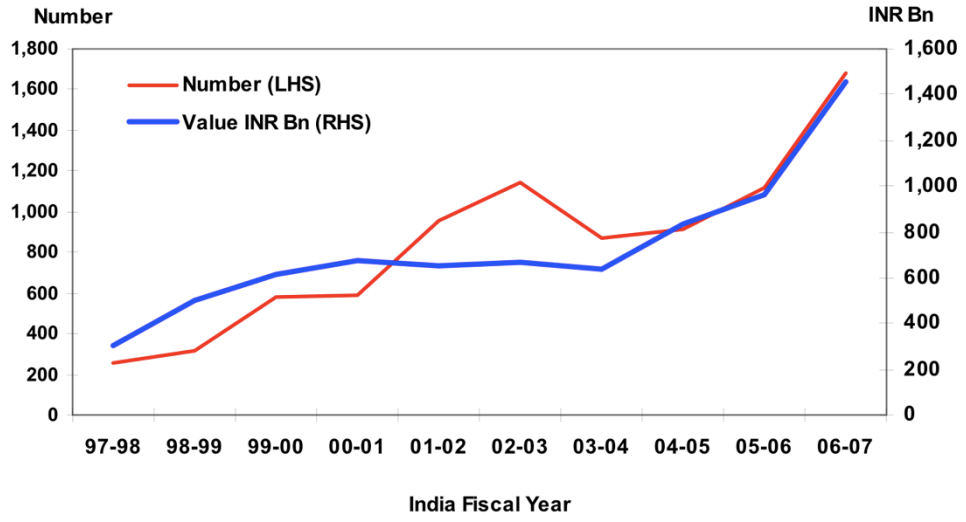
Corporate bond issuances also went through innovations, where even floating rate instruments, zero coupon bonds, convertible bonds, callable (put-able) bonds and step-redemption bonds were issued. Examples included step bonds issued by the Industrial Credit and Investment Corporation of India Ltd. (ICICI, in 1998) paid progressively higher rates of interest as the maturity approached while the IDBI's step bond was issued with a feature to pay out the redemption amount in installments after an initial holding period. The dominance and the preference for private placement in total issuances are because of the lengthy issuance procedure for public issues, which include information disclosure requirements. Another reason corporations avoid public issue is because the costs which are considerably higher than those for a private placement, apart from being able to raise much larger amount through placement in comparison with a public issue. Also, a corporate can expect to raise debt from the market at finer rates than the prime-lending rate of banks and financial institutions only with a AAA- rated paper. This limits the number of entities that would find it profitable to enter the market directly. In India private placement is when corporate security is sold to a small number of investors (usually mutual funds, insurance companies, and pension funds), companies prefer this method as it has to comply with fewer requirements although the placement has to be registered with the regulator.

In actual fact, the ADB (2008) states that although corporate bonds can be issued publicly, most issues in the corporate bond market are not really bonds but private placements, and the interesting fact is that neither do the corporations themselves make the issues.

- Public issues are bonds offered to a wide range of investors and which conform to the regulatory standards required of public issues of bonds. They require a prospectus approved by SEBI, and have to be open at a fixed price for a month with public subscription to allow investors (particularly retail investors).
- On the contrary private placements can be made to a maximum of 50 "Qualified Institutional Buyers" (professional investors) as mentioned above, requiring much less documentation. The small number of investors makes it relatively easy to renegotiate terms. Typically, for example, a change in interest rates will lead to a renegotiation of the coupon on a placement during the currency of the issue.

This makes private placements very flexible. The **Table 3.10** depicts the private placements in terms of value and number.

Figure 3.9 Private Placement Issues



Source: Reserve Bank of India.

Public issues have become rare due to the costs and the excessive disclosure requirements with:

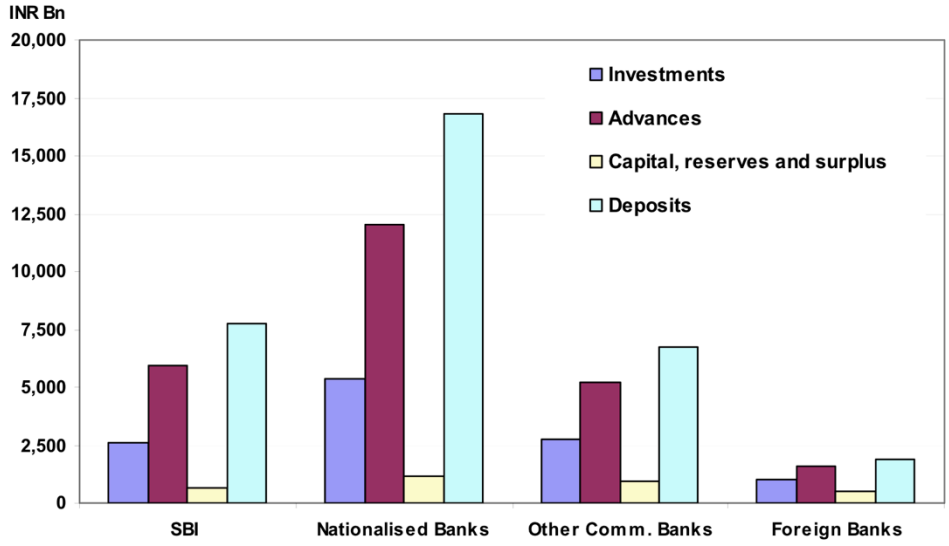
- Prospectuses for bond issues reported to be several hundred pages long. As against international practice, disclosure requirements are identical, irrespective of whether the company is already listed or not.
- There is also no provision for shelf registration whereby a program of tranches can be covered by a single prospectus
- The issue process is also reportedly slow, taking several months, which, with high marketing and other costs, makes public issues very expensive. The slow process also makes issues risky, as the price is fixed throughout the offer period.

In contrast, documentation for private placements is minimal, although requirements have been increased in recent years. Placements can be issued quickly with book building and pricing usually completed within a day.

The government's committee report (Patil report) has recommended the SEBI to allow new listing agreements with stock exchanges. However they still need to be put into place, but the key features include (i) companies publicly-listed on an Indian exchange would be required to make only minimal additional disclosures for a public issue or a private placement; and (ii) unlisted companies would be required to make more substantial disclosures, though less than those required for an equity issue. But another aspect of the Indian private placement issues are generally quite small to international standards, and issuance in 2006–07 totaled US$35 billion with over 1,678 issues (averaging about US$20 million) (ADB, 2008, p. 16). This also forces some corporate issuers to make several separate placements, sometimes even within the same day, and more often so to the same investor (as there are only few available) also under similar terms. As a result the result these so called "bonds" are in fact disguised syndicated loans, considering the fact that the largest investors for private placements are banks.

Private sector, banks, and public companies in effect issue corporate bonds in India. Public sector entities accounted for the largest share of issues with 42% of the value, averaging US$107 million for only 8% of the number of issues. This leaves the private financial companies, largely banks raising money for lending purposes accounting for another 35% in terms of value and 39% of the volume. So this leaves private, nonfinancial corporate issuers with only 23% of value and 53% of the volume, indicating an average value of only US$10 million. The government sector PSU's again dominate the corporate bond market too, leaving the private sector and nonfinancial issuers (usually major participants in other corporate bond markets elsewhere) with only a small proportion in terms of value. Corporate demand is limited for genuine bond finance (as opposed to loans disguised as bonds). Traditionally companies have borrowed from banks to meet financing needs. But that trend has not changed, as bank credit continues to dominate corporate funding, accounting for 90% of financial assets, with state-owned banks representing 70%—a declining but still dominant share as can be observed in Graph 3-7 below.

Figure 3.10 Deposits, Investments, and Advances by Bank Type 2007 - 2008



Source: Reserve Bank of India.

Source: ADB 2008

The main source of finance for smaller companies is from former “development bank” (now termed the "other public sector bank") which have emerged from state-owned development banks but are now private and profit-oriented, these include the ICICI and IDBI. They finance themselves through debt issues, as they are barred issuing deposits. These development banks are active in the private placement market, as they are wholesale borrowers lending to smaller companies. Sometimes these banks can absorb an entire issue of a private placement. The decision as to whether to issue a bond or take a loan is determined through tact, for example as RBI prohibits banks from lending at rates below their published rates, but as prohibition does not apply to private placements, the bank would present the loan as a bond; loans are not subject to stamp duties, whereas bonds are making loans desirable for tax sensitive borrowers.

Thus the public issues market has continued to be dominated by financial institutions, including the ICICI and IDBI, which both together accounted for the entire debt offerings in 1998–99 and all but one issue in 1999–20001. Apart from dominating the public issues market these financial institutions have raised significantly larger amounts through the private placement route themselves. The secondary market for non-sovereign debt, especially corporate paper has been tormented with inefficiencies including extremely poor liquidity. The biggest investors in this segment of the market, namely Life Insurance Corporation of India (LIC), General Insurance Corporation of India (GIC) and Unit Trust of India (UTI) prefer to hold the instruments to maturity, indirectly limiting the supply of paper in the market. The distribution of corporate bonds issued by rating indicates that the number of sub-investment grade issues are minimal and the proportion below and the market is dominated by the largest corporations who are likely to achieve an AAA. While others are excluded from the bond market and obliged to rely on bank finance, where even bond ratings with AA is small. But SEBI’s has been keen on relaxing its rules to increase the proportion of lower-rated bonds.

Table 3.10 Distribution of Corporate Bonds by Issue

% of Total	AAA		AA		A		BBB		Non-Investment Grade	
	Number	Value	Number	Value	Number	Value	Number	Value	Number	Value
1999-00	35	83	25.9	9.4	25	6.1	7.7	0.8	6.4	0.6
2000-01	38.3	76.6	33.6	10.1	21.4	11.6	3.1	1.3	3.7	0.3
2001-02	31.7	61.6	33.5	27.8	24	9.3	7.8	1.1	3	0.2
2002-03	45.6	76	27.1	13.8	18.2	7.5	6.3	1.6	2.8	1
2003-04	50.4	77.5	24.8	14.9	17.3	6.1	6.5	1.1	1	0.4
2004-05	56.7	72.2	22.4	22	11.8	3.7	7.1	1.9	1.8	0.3
2005-06	54.6	75.1	30.8	16.7	9.4	7.8	4.4	0.3	0.8	0
2006-07	57.4	79.5	26.5	16.0	9.7	1.8	6.1	2.7	0.4	0.0
2007-08	39.5	73.1	30.3	19.4	19.7	5.7	7.4	1.5	3.2	0.3
2008-09 (4 months)	22.0	76.7	25.3	14.9	20.7	4.3	23.1	3.3	9.0	0.8

Source: Securities and Exchange Board of India.

Source: ADB 2008

Wholesale trading in the corporate bond market is entirely OTC, with the NSE and the BSE offering order-driven, bond-trading platforms that are used for post-trade reporting but rarely for trading. The exchange-trading platforms are mainly used by a small number of retail participants, but some major banks have acted as the unofficial market makers slowly eliminating the role of brokers especially as they have withdrawn from the government bond markets. SEBI is interested in introducing mandatory, centralized clearing and settlement for corporate bonds to make expand to a wider range of investors, but the market suffers a huge settlement infrastructure deficiency. The RBI has been the regulatory authority for corporate bond repos (as it is considered a money market instrument), and has been considering permitting them. But in effect the Collateralized Borrowing and Lending Obligation (CBLOs) have been on the rise taking over the role of repos, but only limited to government bonds.

3.7 Domestic Institutional Investors

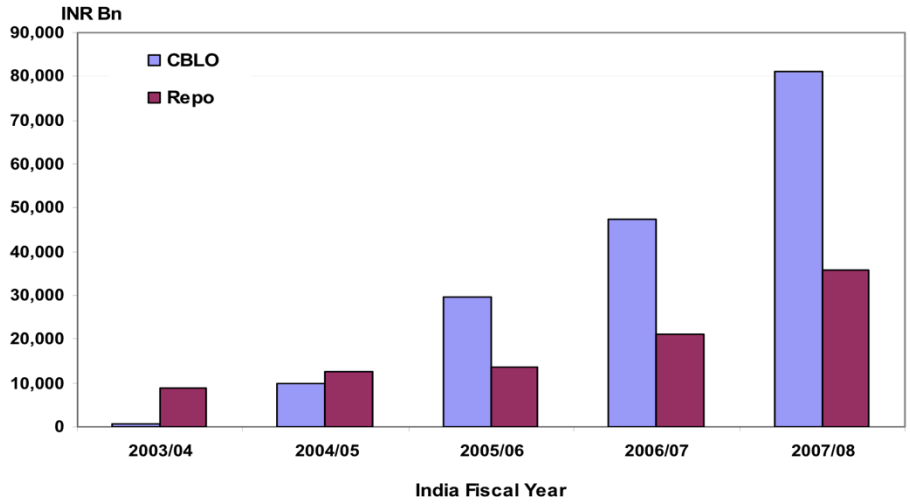
3.7.1 *Repo and CBLO Market*

Where repo is the generic term for repurchase agreements, the repo market is where two participants agree that one will sell securities to another and make a commitment to repurchase equivalent securities on a future specified date, or on call, at a specified price. This sort of borrowing or lending stock for cash allows the stock serving as collateral. In India the government bond repo market is open to primary dealers and banks, which can repo their non-SLR holdings. Repo-eligible securities are government bonds, Treasury bills and state government bonds. Repos are almost exclusively between the market and the RBI and there are few third-party repos. Repo terms can range for over few months, but they are mostly short-dated, for example even a few years ago 3/4th of them were for overnight and almost 1/4th for 2–3 days. The RBI, similar to other central banks uses repo as their principal tool in open market operations to control short-term interest rates. However, market repo rates are determined between private institution, although the central operations are not part of the repo market they only provides a benchmark.

Daily rates are announced and set a band between the repo and reverse- repo rates, where the call money market operates. The volume of repos has grown sharply

in recent years though less fast than the volume of CBLOs. The heaviest borrowers (of cash) in the market are foreign banks (46% in July 2008), public sector banks (33%) and primary dealers (18%) as Figure 3.11 below depicts. These are financial instruments typically used by securities dealers and other leveraged traders to fund the purchase and holding of securities and other assets. Repo's have been part of the wider securities financing mechanism (along with securities lending and borrowing), as they are safer in terms of being used as collateral and obtain cash, lenders are willing to lend more. Cheapness and the ability to borrow more, apart from lower credit risk are the key attractions of repo for borrowers.

Figure 3.11 Recent Repo and CBLO Volumes in India



CBLO refers to Collateralized Borrowing and Lending Obligations.

Source: Clearing Corporation of India Ltd.

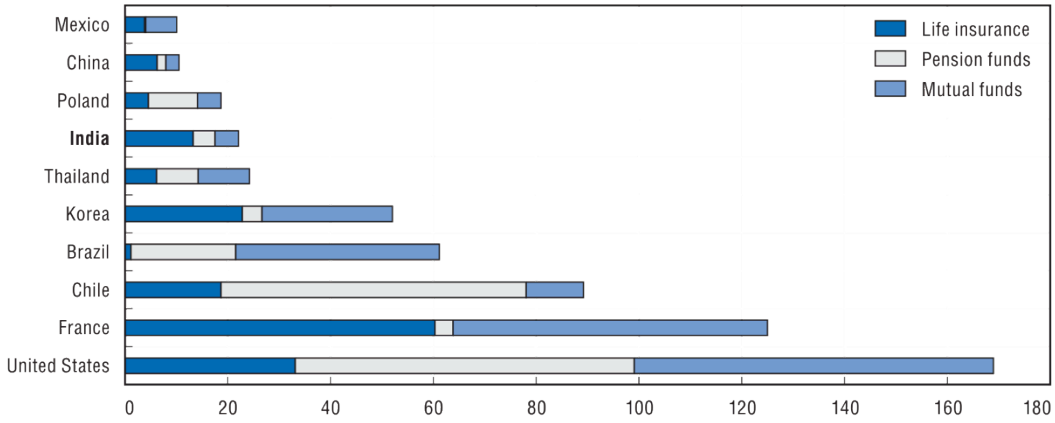
Cited in: ADB 2008

What has been unique to India, is that it developed the CBLO to supplement and bilateral repo market, but in the eventually it is possibly supplant the repo market. The CBLO offers significant advantages over repos: in that the instrument are tradable, allowing a borrower to reverse the position and repay the loan before its term expires, CBLOs are considered secure because of the involvement of the CCIL as guarantor of each transaction. This allows low failures and participants with lower credit ratings can mainly use it. CBLOs are offered similarly to repos, with 3/4th being overnight, but they could also be for a year. As of 2008 there were more than 160 lender and mutual funds were the largest lenders around 3/4th of the market followed by insurance companies representing 11%. On the borrowing side, they were mostly banks with almost half of being lent to public sector banks, with private sector banks and foreign banks borrowing another third of the entire volume. The CCIL, the clearing agency in fact now operates a market for CBLOs, which is a form of tripartite repo (approved by the RBI) that allows market participants to create borrowing facilities by placing collateral securities (government bonds and treasury bills) at the CCIL. CBLOs are innovative and unique to India, for refinancing short-term funds, and the main requirements on participants (for CBLOs) are that they have a constituent subsidiary general ledger (SGL) account for stock and an account with a recognized settlement bank.

3.7.2 *Insurance and Pension Sectors*

Demand by households for varied financial assets has risen, not only with investments in bank deposits but also in institutionally managed funds, although it is still comparably low compared to other countries. Although private sector mutual funds have expanded markedly, the assets of the insurance sector are still dominated by the state-owned life Insurance Company of India (that exists for over 50 years now), which invests 80% of its assets in public sector liabilities (OECD, 2007, p. 156) as can be observed below in Figure 3.12. LIC also dominates the Insurance sector although it faces competition from private sector insurers but in terms of investment it represents 98% of the market. Although LIC is only required to hold 25% of its assets in government bonds, in reality it still maintains about 75% of its assets in government bonds. Private sector insurers are similarly conservative. Regulations also restrict companies, as they are not allowed to raise debt or go public in their first decade of operation, putting the onus on shareholders to fund costlier growth. Foreign ownership in the life insurance sector is capped at 26%. The LIC went through reform in 1981 through decentralization by spreading its network deeper into the country, which made its operation much more effective

Figure 3.12 Institutional Investors: an International Comparison of Funds under Management (Life Insurance, Pension and Mutual Funds, % of GDP 2005)



Source: McKinsey Global Institute (2006).

Source: OECD 2007

Table 3.11 Legislation and Important Developments in the Insurance and Pension Market

Year and Legislations	Development and Details
Insurance 1999, IRD Act	Insurance Regulator: Insurance Regulatory and Development Authority
Pension 2003, PFRDA Bill	Pension Regulator: Interim pension fund regulator: PFRDA Bill 2005 still awaits approval of Parliament
Liberalization of Insurance to Private Sector 2000	But State-run LIC still the largest 65% (total premium income of Rs1.57 trillion in March 2009) (livemint.com, December 1, 2009)

Source: Compiled by the Author, from relevant websites and livemint.com

The largest pension scheme in the country the Employees Provident Fund Organization (EPF) has not been successful administrative, and matching benefits to contributions apart from raising volume. The government also owns this organization where 5% of the labor force in the economy makes compulsory contributions, and it is subject to no outside regulation. It is its own fund manager and has a cumbersome system of governance with a board of governors that has 45 members and is chaired by the Minister of Labor. Private sector pensions are often managed by the publicly owned Life Insurance Company of India, which is regulated by the Insurance Regulatory Development Authority. Another reserve funds for employee severance payments are only regulated, to a certain extent, by the tax authorities. Even after the passage of the new Act, regulation of long-term saving schemes has not been effective.

Pension systems have been dispersed, and there even exists scheme for civil servants, New Pension Scheme (NPS) that offers the possibility of generating a significant amount of funds for management. This scheme is not restricted the government employees and is actually open on a voluntary basis. Original plans to allow participants to choose between four different funds have faced parliamentary opposition. Most pension funds are still controlled by legislation, not allowing investment in financial assets other than government bonds although the government is considering for example NPS funds to be invested in the stock market, government debt and corporate bonds. Once the Pension Act is passed, the Authority may allow a much greater mix of assets in four major funds in the country. Allowing greater investment diversity for both life insurance funds and government pension funds (including the EPF), similar to other Asian countries would be required in the long run, also allowing private companies to diversify their sources of finance. Insurance and Pension funds are also more crucial in providing funds for longer gestation periods.

Pension funds tend to hold a larger percent of government bonds than required. The pension fund sector is mainly controlled by various state-run provident schemes. Although the new pension system is to be based on individual accounts, it is still not clear as to when this will be in place. The current structure of investors includes many with heavy state involvement. In addition competition is limited for example in the low-premium life business. These investors may lack the incentive (and the skills) to engage in more active investment strategies. For example, since January 2004, newly recruited employees of the Central and 19 state governments contributed about Rs 40 billion to the new scheme being managed by subsidiaries of State Bank of India, Life Insurance Corp. of India Ltd. and UTI Asset Management Co. But this figure could rise to US$300 billion by 2020 with if reforms are put in place, with a more active regulator and more competition. Apart from this, foreign firm are also not allowed to operate in the pension sector and private Indian players hardly have any presence.

3.7.3 *Mutual Funds*

Where Mutual Funds have come to mean a professionally managed type of collective investment scheme that pools money from many investors and invests it in stocks, bonds, short-term money market instruments, and other securities. Worldwide pension funds were accompanied by mutual funds in taking over a market share in the financial system development over the last 40 years. Mutual funds were essentially a post-World War II phenomenon, where it rose in the US up to 17% in terms of the intermediation in 2003 (measured based on total assets) (Greenbaum & Thakor, 2007, p. 68). Its significant growth was the penetration of mutual funds among households, which again even reached to half the household population in the US. According to Greenbaum and Thakor (2007) these investment vehicles had in fact grown to about 60% of the size of commercial banks and larger than pension funds, insurance companies, and savings institutions from their inception. Domestic mutual funds have played a key role in resource mobilization and it has been an example of how the private sector have eroded the government PSU and improved market performance.

The market share of the public sector fund manager (Unit Trust of India) has been progressively eroded from two-thirds prior to reforms to 6% by 2006. This public sector fund manager had to be completely restructured in 2002, for the second time, due to failure of its investment portfolio to meet the assured returns that it had promised to investors. According to the regulator, SEBI (2009) mutual funds have played an important role in mobilizing the household savings for deployment in capital markets. In India Mutual funds are categorized into three: private sector mutual funds, UTI mutual Fund and other public sector mutual funds. The gross mobilization of resources by all mutual funds during 2008-09 stood at Rs.5.42 Trillion compared to Rs.4.46 trillion a year earlier with an annual increase of 21.6 (SEBI, 2009, p. 59). The mutual funds were one of the major investors in the debt segment of the Indian securities market. During 2008-09, the combined net investments by the mutual funds in debt and equity were Rs.887.87 Billion with net investments in the equity market at Rs.69.84 billion in 2008-09. Investor accounts increased by 9.8% in 2008-09 over the previous year, with the total number of investors in mutual funds expected to be less than 47.6 million (figure not exact due to possible error of double counting). Of these about 46.1 million were individual investor accounts which account for 96.8 %of the total number of investor accounts and contributed Rs.1.55 trillion which is 37.0 % of the total net assets. Table 3-12 depicts the scheme wise resource mobilization and assents managed by Mutual Funds. The private sector mutual funds also manage 80.5% of the net assets as against 19.5% assets managed by public sector mutual funds.

The mutual fund market however has also developed rapidly in India and is now almost exclusively private. Specialist "gilt funds" (which have access to the RBI liquidity facility) have been set up to invest exclusively in government securities. However, the nature of the Indian mutual fund industry's customer base is largely corporate that use mutual funds for short-term treasury management (it means that the bond funds are treated as money-market funds and must invest mostly in short-term bonds and bills). The mutual Fund Industry in India is of the size of Rs7.2 trillion (around US$156 Billion) capital market regulator, the SEBI has been regulating the sector (www.livemint.com accessed on August 27th 2009). In fact Indian asset management companies (AMCs of which there are 36) are making plans to start their own distribution business instead of selling funds through third-party distributors.

Table 3.12 Scheme-wise Resource Mobilization and Assets under Management by Mutual Funds as of March 31, 2009

Schemes		No. of Schemes	Gross Funds Mobilised (Rs. Bil)	Repurcha-ses Redemption (Rs. Bil)	Net Inflow/ Outflow of Funds (Rs. Bil)	Cumulative Assets under Management as on March 31, 2009 (Rs. Bil)	Per cent Varia-tion over March 31, 2008
1		2	3	4	5	6	7
A	Income / Debt Oriented Schemes of which	599 (593)	53,833.67 (43,172.63)	54,155.28 (42,133.96)	-321.61 (1,038.67)	2,943.49 (3,129.97)	-5.96 (61.68)
	i) Liquid / Money Market	56	41,879.77	41,915.76	-35.99	90,594	1.33
	ii) Gilt	34	146.96	110.90	36.06	64.13	126.37
	iii) Debt	509	11,806.94	12,128.62	-321.68	1,973.43	-10.61
B	Growth / Equity Oriented Schemes of which	340 (313)	328.05 (1,262.86)	287.81 (793.53)	40.24 (469.33)	1,082.44 (1,727.42)	-37.34 (39.76)
	i) Equity Linked Saving Scheme	47	33.24	3.56	29.69	124.28	-22.42
	ii) Others	293	294.81	284.25	10.55	958.16	–38.86
C	Balanced Schemes	35 (37)	26.95 (114.88)	26.34 (57.20)	61 (57.68)	106.29 (162.83)	-34.72 (78.74)
D	Exchange Traded Fund of which	17 (13)	57.19 (93.39)	67.18 (121.06)	-9.98 (-27.67)	13.96 (3,130)	-55.4 (-)
	i) Gold ET	5	2.71	1.87	0.84	7.36	52.38
	ii) Other ETFs	12	54.48	65.31	– 10.83	6.60	–75.07
E	Funds of Funds Investing Overseas	10	17.67	9.89	7.78	26.81	(-)
TOTAL (A+B+C+D+E)		1,001 (956)	54,263.53 (44,643.76)	54,546.50 (43,105.75)	-282.96 (1,538.02)	4,173.00 (5,051.52)	-17.39 (54.82)

Note: Figures in parentheses relate to 2007-08.
Source: SEBI Annual Report 2008-09

3.8 Foreign Institutional Investors and Foreign Investment Regulations

Since 1992-93, when FIIs were allowed entry into Indian financial markets, foreign institutional investment and participation in the markets have significantly increased. With a boom in the stock markets investments by FIIs into India were quite high in last few years, particularly since 2003-04. In terms of percentage the gross purchases of debt and equity by FIIs declined by 35.2% to Rs.6.145 trillion in 2008-09 (SEBI, 2009, p. 63). Table 3-13 shows the FII and Mutual Fund investments. Last year saw the highest net outflow for any financial year so far, as FII inflow into India had surged continuously since 2003-04. However, last year (2008-09) saw the highest FII outflow ever since the post-reform period most likely attributable to the global financial meltdown and the home country bias of FIIs in the crisis.

Table 3.13 Investments by Mutual Funds and Foreign Institutional Investors (Rs. Billion)

Year/ Month	Net Investment by Mutual Funds			Net Investment by Flls		
	Equity	Debt	Total	Equity	Debt	Total
1	2	3	4	5	6	7
2006-07	90.62	525.43	616.07	252.36	56.05	308.41
2007-08	163.06	737.90	900.95	534.04	127.75	661.79
2008-09	69.84	818.03	887.87	-477.06	18.95	-458.11
Apr-08	-1.12	164.38	163.27	10.75	-17.02	-6.27
May-08	0.64	59.19	59.82	-50.12	-1.63	-51.74
Jun-08	31.79	32.64	64.43	-100.96	-9.99	-110.95
Jul-08	14.12	57.89	72.01	-18.37	36.19	17.82
Aug-08	-36.9	74.64	70.95	-12.12	12.58	0.46
Sep-08	22.92	64.17	87.09	-82.78	32.04	-50.74
Oct-08	14.32	-260.82	-246.50	-153.47	-18.58	-172.05
Nov-08	-3.73	-35.99	-39.71	-25.98	42.15	16.17
Dec-08	3.41	136.50	139.91	17.50	6.27	23.77
Jan-09	-8.64	184.22	175.57	-42.45	8.02	-34.43
Feb-09	-14.96	166.43	151.47	-24.37	-6.88	-31.24
Mar-09	14.76	174.78	189.54	5.30	-64.20	-58.90

Source: SEBI Annual Report 2008-09

Although during 2008-09 there was an outflow from the equity segment amounting to Rs.477 million, the debt segment, however, witnessed a positive net inflow of Rs.18.95 million. Foreign fund managers wishing to invest in Indian debt securities need to first apply to SEBI and gain a FII certificate. Certificates are valid for 3 years and are renewable. FIIs in turn register individual sub-accounts for each investor for which they act. SEBI has introduced a number of reforms to smooth access for foreign investors:

- FII status is not open to individuals, hedge funds, corporates, or to fund managers;
- FIIs can now undertake short-selling and stock borrowing/lending on par with domestic investors;
- Registration has been simplified; and
- FII status has been opened to non-resident Indians (NRIs).

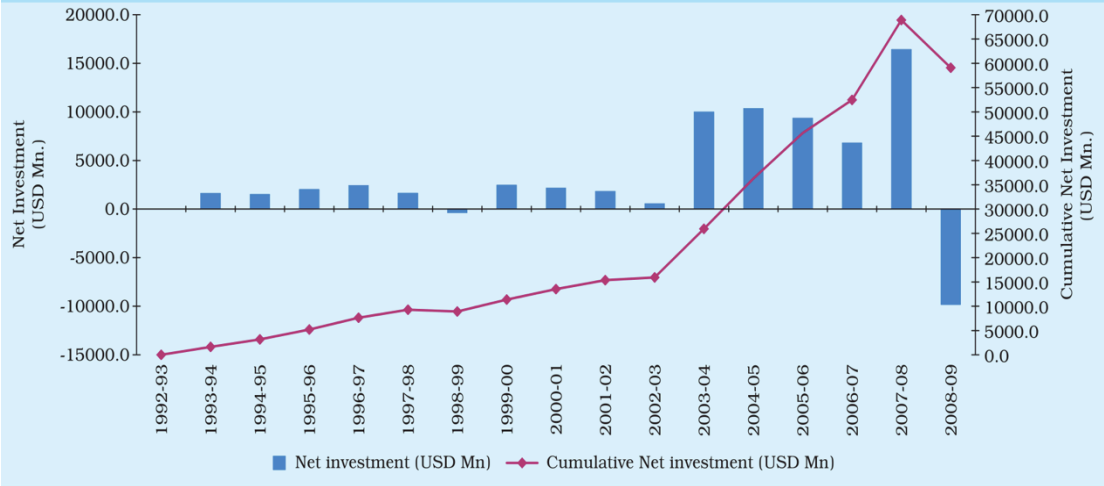
There are currently 1,483 FIIs operating 4,474 sub-accounts as of September 2008 (ADB, 2008, p. 36). The number of FIIs have increased significantly over the years following the reforms from 685 at end 2005, though the bulk of these are active in equities and derivatives rather than bond markets. FIIs are also limited by SEBI in the amount they can invest and their investments are subject to monthly reporting.

In terms of quantitative limits, in January 2008 FIIs were subject to changes in the method of assessment with the methodology to include investments in bond mutual funds. As the total invested amount exceeded the aggregate limit, FIIs were restricted from further investment until their aggregate holdings were reduced to conform to the aggregate limit. Although foreign investor access remains controlled, FIIs are increasingly important holders of domestic bonds and have become major players in equities. Percentage ownership is limited to 24% for most companies, 20% for public-sector banks. At the end of March 2008, foreign investors owned 15% of the shares of the companies in the BSE 500 (the main blue chip index). For comparison a recent survey has estimated that FII holdings of Indian equities were approximately 10 times

the holdings of domestic mutual funds and indeed exceeded the combined holdings of domestic financial institutions, including mutual funds and insurance companies, retail and high-net worth investors. Generally FIIs are permitted to invest in derivatives (including theoretically in bond-related derivatives—though these do not currently exist). SEBI has periodically imposed limits on FII derivative activities when it appeared that derivative use risked compromising other policy objectives such as limits on foreign ownership.

Historically FIIs had not been attracted to Indian debt markets until recently where rapid economic growth has become a hallmark for the Indian economy and improvement of India's sovereign rating have led to FIIs to increasingly invest in Indian debt markets, that include both government and corporate. On the contrary the market regulator is trying to contain and regulate FIIs, possibly with a view to reduce foreign exchange and volatility risks (in terms of any sudden outflows), where this happened last year. Currently there is an aggregate cap of US$5 billion of government debt and US$3 billion of corporate debt. The aggregate caps have been raised over time—twice during 2008 (from US$2.6 billion for government bonds and US$2 billion for corporate bonds. Individual FII/sub-accounts are allocated limits within the aggregate total permitted. Individual limits are allocated on a first come first serve basis up to a maximum currently at US$200 million. FIIs are required to fulfill their allocations within 15 days of the application being approved. Corporate bond holdings exceeded the permitted aggregate total in January 2008; this was particularly due to an unexpected change in the calculation methodology). At end June 2008, FII domestic debt holdings totaled US$3.87 billion, up from US$2.29 billon at the start of the year (the total permitted investment is US$8 billion) (2008, p. 37). As the Figure 3.13 below shows however, although there was a large outflow last year, the cumulative amount still remained high.

Figure 3.13 Trends in Foreign Institutional Investment



Source: SEBI Annual Report 2008-09

In fact according to reported trends in periodical, the last 18 months, have has swings in foreign capital flows and were becoming a concern. All foreign investors argue against being taxed for them, as that would hurt investor confidence and the country's reputation. The existing mechanisms of intervening in this market are through sterilizing inflows by issuing special bonds, where RBI in the past used market intervention bonds to absorb excess liquidity generated by large foreign capital inflows. Foreign investors had by the end of last year (livemint.com, Nov 23 2009 accessed the same day) invested more than US$15 billion of local equities in 2009, after selling US$13 billion in 2008, helping send Indian stocks up about 75% and lifting the rupee to its highest in more than a year. Where capital inflows are part of a globally

where international institutional investors chase faster growing emerging markets, especially under the sluggish recovery and low interest rates in developed economies.

Although it is not the purview of this work, but raised inflows could be seen in creating asset price bubbles and drive currencies to uncompetitive levels as the RBI already faces excess liquidity in the market and has recently been struggling with controlling inflation. Other emerging economies have faced similar situations by imposing controls, where Brazil and Taiwan have already imposed controls while Russia is considering doing the same. But India in general has a larger task of improving intermediation to capture the growing domestic savings (as the rates are really high now), and in the short run be improving conditions in order to encourage more domestic participation in its equity markets to counter the impact of foreign investment flows. Indian institutional investors are still week, and lack the capacity to counter rapid fund flows as the funds themselves still considerably small. Apart from that regulations are stringent where government pension funds banned from investing in equities, and private pension funds can only invest 5% of their assets in equities.

Another inlet the GOI has used to allow Foreign Investment has been the NBFCs which have become an integral part of India's financial system. The government has specifically listed certain categories of NBFCs that are eligible to receive foreign investments, and NBFCs have emerged as lenders to both companies and individuals. When it comes to lending, NBFCs are generally regarded to be complementary to banks in India only certain categories of NBFCs that are eligible to receive foreign investments. As India's foreign exchange laws regulate and govern foreign investment in certain categories of financial service companies and the categories of activities they can carry out, these are referred to as FDI NBFCs.

FDI NBFCs, by definition are not necessarily the same as NBFCs defined under the RBI Act. FDI under the automatic route (that is, without prior approval of the government) is permitted in 18 identified financial service/sector activities (including merchant banking, underwriting, portfolio management services, investment advisory services, financial consultancy, leasing and finance, stock broking, asset management and venture capital). FDI NBFCs are also subject to the prescribed minimum capitalization norms, where minimum capitalization in a "fund-based" NBFC for FDI of up to 51%, US$0.5 million has to be brought in upfront. For FDI above 51% and up to 75%, US$5 million is the minimum capitalization to be brought in upfront and for FDI above 75%, the minimum capitalization required is US$50 million, of which US$7.5 million is to be brought in upfront and the balance within 24 months. Irrespective of the level of shareholding in a "non-fund-based" FDI NBFC, the minimum capitalization requirement is US$0.5 million.

Systemically important NBFCs are required to comply with cash adequacy ratios, single borrower limits, single investment exposure limits, and so on, which are not applicable to NBFCs that are not accepting public deposits. Recently, Sebi included systemically important NBFCs and certain other types of NBFCs not accepting public deposits as "qualified institutional buyer" for the purposes of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (Sarfesi Act). These amendments are to enable NBFCs to subscribe to security receipts issued by securitization and reconstruction companies and will be entitled to protections accorded to qualified institutional buyers under the Sarfesi Act. The multiplicity of regulations, directions and certain overlapping categorizations has often led to confusion in the NBFCs domain (livemint.com, Jul 20 2008 Accessed the same day). As NBCs are emerging as a very important segment of the Indian financial system, there is a need to categorize and simplify the regulatory system. Although this section will not get into the depth of the external sector or monetary policy, as the scope is to only profile the financial system in order to understand the case for

intermediation. The Table 3.14 below outlines the legislations and developments in the foreign investment, exchange market and external sector.

Table 3.14 Legislation and Important Developments in the Foreign Exchange Foreign Investment and External Sector

Year and Legislations	Development and Details
Monetary policy 1934 Reserve Bank of India Act, 1934	RBI, originally privately owned, nationalized since 1949. Regulates FIIs and also oversees the Foreign Exchange Market
1991 FIPB and FIPC	Foreign Investment Promotion Board (FIPB) set up, with a Council set up later in 1996: Foreign Investment Promotion Council (FIPC)
Foreign Exchange 2000	Foreign Exchange Management Act, 1999 to replace the Foreign Exchange Regulation Act, 1973
2003 FIPB transferred to DEA, MoF	FIPB is a special agency in India. In 2004 an Investment Commission was also set up
2003 Working Group on Interest Rate Futures (Chairman: Shri V.K. Sharma)	The Group was constituted to review the experience gained with interest rate futures since its introduction in India with particular reference to product design issues, and these were incorporated in the Technical Advisory Committee (TAC) for Money, Foreign Exchange and Government Securities Markets
1999 Setting up of the Foreign Investment Implementation Authority (FIIA)	FIIA to facilitate FDI approvals, assisted by Fast Track Committee (FTC), that have been established in 30 Ministries/Departments of GoI for monitoring and resolution of difficulties for sector specific projects.
2007 Internal Working Group on Introduction of Currency Futures in India (Chairman: Salim Gangadharan)	That was a part of the efforts in the Introduction of Interest Rate Futures, and was further discussed in TAC on Money, Foreign Exchange and Government Securities Market
2008 RBI-SEBI Standing Technical Committee	Committee set up to advise on operational aspects in regard to trading of currency futures on exchanges.

Source: Compiled by the Author, from relevant websites and livemint.com

3.9 Securitization

Securitization was generally small in EEA markets and in including India at the beginning of this decade accounting for less than 0.2% of GDP in 2001. But by 2006 a number of the region's economies, especially Korea, Malaysia, Philippines, and Singapore have expanded securitization levels considerably levels reaching up to 4.0% of GDP. Although India was very early in securitization among Asian markets, where transactions even took place even in the early 1990s. But the growth for this sector only accelerated from 2000, taking volumes up to Rs 580 billion (US$12.5 billion) in fiscal 2007/08 roughly 1% of GDP. However, the securitization market is believed to have not yet taken off, as volumes tend to be low and asset types limited. With the market being subject to excessive regulatory, legal, and tax uncertainties, volumes appear to be mainly influenced by tax or regulatory arbitrage considerations rather than by underlying financial factors.

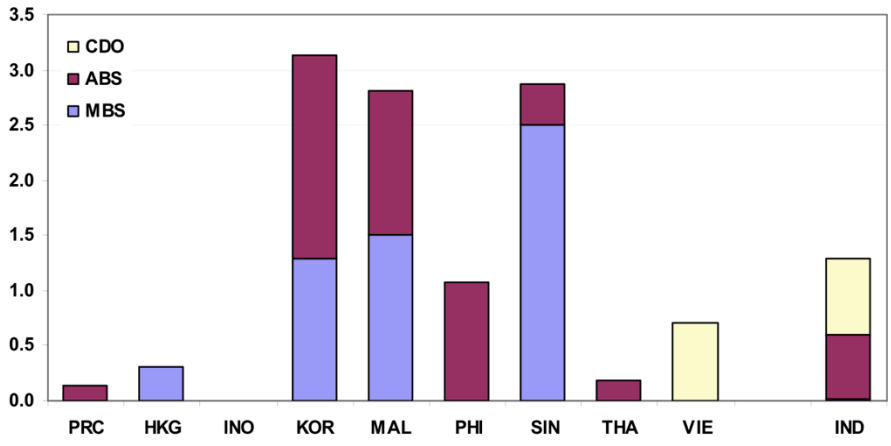
As the nature of the securitized assets suggests, originators have mainly been banks and nonbank financial institutions, by far including the former development banks that have been privatized and which have become major players in the consumer lending market, and housing finance companies. The CRA estimates that the top five originators of securitized assets account for about 80% of issuance. There has also been some securitization of corporate loans with substantial credit enhancement, included

single loan securitizations. The preference for asset-backed securities (ABS) is similar to the patterns observed in other parts of Asia including Korea and the Philippines. Although mortgage-backed securities (MBS), that are more prevalent in Malaysia and Singapore, have not been so popular in India. As insurers are subject to restrictive investment mandates, securitized assets are structured to obtain high ratings and enhancements include direct recourse to the originator (often structured as put options), originator or third-party guarantees, over-collateralization (by providing cash collateral and reserves).

The Securitization and Reconstruction of Financial Assets & Enforcement of Security Interest Act, which was intended to clarify the status of securitization, has been enacted, but is regarded as having had little effect. After much delay, the RBI implemented the Basel II standardized norms in March 2009 and is moving to internal ratings in credit and advanced measurement approach (AMA) norms for operational risks in banks. RBI regulations, which were already noted to be stricter than Basel II—have encouraged more direct assignments (cash flow transfers without SPVs). Developing the securitization can be pushed for by providing incentive to securitize and by setting up standard assets to securitize, as financial institutions will securitize only if they have the need to reduce the size of the balance sheets or if they are under competitive pressure. Securitization enables financial institutions to realize profits on their current assets by selling them, but this will require a supply of assets that typically can be securitized at the start of the market. These are the standard assets such as mortgages, auto loans, and credit card receivables, as well as infrastructure projects where future cash flows can be securitized.

India's banks have not felt pressure on their balance sheets so far—though credit demand suggests they may. Other entities such as auto finance companies have been active but they are small relative to the bank market. In considering which assets to securitize: (i) India is still developing its credit card market; (ii) auto loans are being securitized but the residential mortgage market remains too small for securitization on any scale; and (iii) India's infrastructure demands are huge—but the main expenditure is in the future. As a result, there has so far been limited incentive for securitization. But this may change as credit demand and infrastructure expenditure increase. The use of securitization to finance infrastructure development and remit the cash flows could diversify the investor base for infrastructure debt.

Figure 3.14 India and EEA Securitization (% of GDP 2007)



Sources: AsianBondsOnline, ICRA Ltd., and Reserve Bank of India.

Source: ADB 2008

While in Korea, Philippines, and Malaysia, securitization was done through policies designed to recapitalize the banking sector. But in India auto loans were the mainstay of the securitization market in the 1990s. Since 2000, residential mortgage-backed securities (RMBS) have also contributed to market growth, although RMBS activity has been dormant over the last 2 years. But the focus on ABS has claimed the biggest share of the market where in FY2007 accounted for 63%, followed by CDO and Collateralized Loan obligations (CLO's) at 32%. While in 2007/08, CDO/CLO issues representing 54 % together with ABS (45% of the total) accounted for 99% of securitization volumes (ADB, 2008, p. 30). Credit card securitization has still not taken off mainly to credit card market, while showing rapid growth still remains small, but also partly because of stamp duty costs. There have also been limited future flow securitizations, such as toll receipts, and some infrastructure financing like for national highways. Demand for infrastructure financing in India is only now being now recognized as crucial, and it is expected that securitization of receivables from such projects should expand rapidly in the future.

3.10 Peculiarities of the Indian Financial System: Domestic Savings and Stunted Market

The Savings Rate in India is edging towards 40% of GDP (livemint.com 18 Jan 2010 accessed the same day) increasing rapidly from humble beginnings prior to the reform period rate at a little over 10%, and this is justified according to the theoretical view that under repression saving rates are inhibited. The looming issue is although India now has about US$400 billion in domestic savings, very little is currently being funneled through the financial markets (even through banks) to fund, for example the country's huge requirements to build infrastructure. Closer examination of the trends in savings from the RBI Macro-economic Data (2009) reveals just how much of the savings and investment is actually fueling India's economic growth. Where Indian households save 28% of their disposable income, unfortunately only half of these are even invested as savings in bank deposits and other financial assets (refer to Table 3.15). Of the other half, 30 % is invested in housing, and put the remainder that amounted to US$24 billion in 2007-2008 is put into machinery and equipment for the 44 million tiny household enterprises that make up the economy's unorganized sector. In 2005, Indian households also bought more than US$10 billion worth of gold, which obviously is another form of non-financial savings; now making India the world's largest gold consumer.

Table 3.15 Rates of Gross Domestic Saving and Investment (% of GDP at current market prices)

Item	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07 PE	2007-08 QE
1	2	3	4	5	6	7	8
1. Household Saving	22.1	22.9	24.1	22.8	24.1	24.1	24.3
of which :							
a) Financial assets	10.9	10.3	11.4	10.1	11.7	11.7	11.7
b) Physical assets	11.3	12.6	12.7	12.7	12.4	12.4	12.6
2. Private Corporate Saving	3.4	4.0	4.6	6.7	7.7	8.3	8.8
3. Public Sector Saving	-2.0	-0.6	1.1	2.2	2.4	3.3	4.5
4. Gross Domestic Saving	23.5	26.3	29.8	31.7	34.2	35.7	37.7
5. Net capital inflow	-0.6	-1.2	-2.2	0.4	1.2	1.1	1.4
6. Gross Domestic Capital Formation #	22.8	25.2	27.6	32.1	35.5	36.9	39.1
7. Gross Capital Formation	24.2	25.2	26.8	31.6	34.8	36.4	38.7
of which :							
a) Public sector	6.9	6.1	6.3	6.9	7.6	8.0	9.1
b) Private corporate sector	5.4	5.9	6.8	10.8	13.7	14.8	15.9
c) Household sector	11.3	12.6	12.7	12.7	12.4	12.4	12.6
d) Valuables	0.6	0.6	0.9	1.3	1.2	1.2	1.1
8. Total Consumption Expenditure (a+b)	76.9	75.2	73.1	69.4	68.1	66.4	65.3
a) Private Final Consumption Expenditure	64.5	63.3	61.8	58.7	57.6	56.2	55.2
b) Government Final Consumption Expenditure	12.4	11.9	11.3	10.7	10.5	10.2	10.1
Memo							
Saving-Investment Balance (4-6)	0.6	1.2	2.2	-0.4	-1.2	-1.1	-1.4
Public Sector Balance	-8.9	-6.7	-5.3	-4.7	-5.2	-4.6	-4.6
Private Sector Balance	8.8	8.4	9.2	6.1	5.7	5.2	4.7
a) Private Corporate Sector	-2.1	-1.9	-2.2	-4.0	-6.0	-6.5	-7.0
b) Household Sector	10.9	10.3	11.4	10.1	11.7	11.7	11.7

PE : Provisional Estimates. QE : Quick Estimates. # : Adjusted for errors and omissions.
Note : Figures may not add up to the totals due to rounding off.
Source : Central Statistical Organisation.

Source: RBI 2009

India's economy would grow faster if the financial system could attract more of the nation's savings and channel them into larger-scale, more productive enterprises, and to provide for funding to projects that larger investment and with longer gestation periods. The RBI has also been undertaking efforts to continue reforms in order to divert US$7 Billion a year to GDP (which is just half of the household savings used to purchase gold or machinery in sub-scale household enterprises) through the financial system to invest more productively. In this regard the next generation of financial reforms is already being mentioned in policy circles, but something seriously needs to be done to channel this growing reserve of savings to make its way into productive investments. With the recent global financial meltdown again dampening Indian appetite for financial liberalization, especially the country and its regulator were found on the right side where in fact active regulation of the financial sector and restrictions on foreign investors safeguarded the economy from one of the worst global downturns.

Table 3.16 Major Developments in the Financial Sub-Sectors after during the Reform Period

Sphere / Sector	Pre-1991 System	Reforming through	New System
Financial	State controlled, Bank based, Credit Based System	Financial liberalization – to improve intermediation	Capital-Market system: expanding and diversified markets that provide better intermediation: with more instruments: equity, bonds, insurance and pension, securitization
Banking	Public Sector Banks dominate the financial space, and lend primarily to government in a repressed economy determined by law	Financial liberalization	PSB's many privatized, competition emerges with private and foreign banks, intermediation more open, although government remains primary
Bonds	Absent as prior to 1992, money was collected and lent according to Plan	Through expanding debt market	Primarily financing primarily government securities (G-secs) issued by the RBI. Strictly monitored by the RBI, Corporate Market weak
Equity Markets	Centrally controlled, and industries strictly monitored using licensing (License Raj)	Investment in debt markets raised also through mutual funds	New stock exchanges established, and industries freed up to raise their own capital through equity
Pension and Insurance	Markets not well developed		Insurance opened up to private sector operators, but still dominated by public sector owned corporations

Source: Compiled by the Author, from relevant websites and livemint.com

Even though the ability of firms to raise funds externally through the issuance of bonds is becoming a reality in India, which is also crucial for economic development, government borrowing as seen in the sections above could be "crowding out" private borrowers. It is expected that further reforms will undoubtedly occur in the near future such as permitting banks to enter the insurance and securities market, partly, or fully privatizing the PSBs and the further reduction of the CRR and SLR. However, the gradualist approach to financial reform advocates the need for developing and strengthening the supervisory systems before the implementation of such reforms (Arun & Turner, 2002, p. 441). Analyzing the financial markets through the theoretical framework at the beginning of this session, it is pretty evident that India's financial market has although been developing capital markets; moving away from a credit based bank system. Looking at the world data on the composition of financial markets, it becomes a little simpler to understand in which direction India's financial markets are evolving. As they are slowly moving to international standards, the process of reform and intermediation through liberalization has been gradual yet steady. This can be understood keeping in mind the size and political economy of the country. But international trends suggest that as countries move from middle income to high-income status the relative size of the bank assets, equity market capitalization debt securities (especially international placements) grow rapidly.

With the investment needs in Indian infrastructure over the current 5-year plan (until 2012) is estimated at a soaring US$475 billion (Rs18.7 trillion), only then with the economy grow faster, and in fact contribute to the overall economic development goals! But other estimates also suggest that at the existing levels of investment, the country will miss the target by a staggering US$162 billion. Although tax collections are buoyant in India, the public sector is already being stretched beyond capacity. The government prioritizes social spending on populist concerns, as it has done with rural job guarantees. Although the PSP and foreign investors will in the long run contribute to the shortfall in spending in infrastructure projects, there is a growing awareness that ultimately, domestic capital has to take the lead. As this section outlined, with functioning corporate bond market deficiency and the overindulgence of government sector in the Bond market and PSU's in the corporate bond market and debt market, productivity in this sector is only expected to grow more gradually. Where developing domestic capital markets is not an easy, widespread stock ownership can be problematic unless the legal system protects the interests of minority shareholders. With regards to Infrastructure companies a more promising way to change the political calculus is to try to ensure that the stock in private infrastructure companies is held at least in part by many small domestic investors (Gomez-Ibanez, 2003, p. 357). Efforts to deepen and broaden local capital markets by developing pension funds and other schemes may be extremely important in broadening support for private infrastructure.

3.11 Conclusion

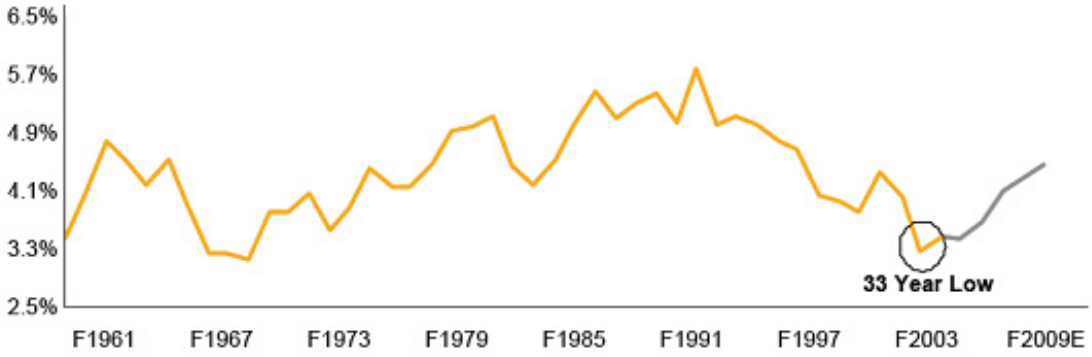
Financial systems that efficiently provide intermediation have been able to develop a range of instruments and institutions that are crucial in providing financing and funding public and private initiatives, depending on the countries' needs and stage of development. Financial systems however have been crucial for economic development; their primary role as providing intermediation in the political economy has received less attention. As the initial thrust towards economic reform and liberalization came from the BOP financial crisis, India has been especially sensitive to financial repression and financial sector development. Developed countries having an extremely large share in holding bank assets, equity market capitalization and both international and domestic debt securities, which suggests that developing countries have a long way to go in developing their financial markets. Although India over the last 20 years has moved away from a bank-based system in developing its equity markets (with a surge in market capitalization), it still has a long way to go in developing its security markets (especially corporate bond market), domestic institutional investors (mainly pension and insurance markets). It is clear however that India is moving away from a state-centered, public finance approach, (through financial liberalization and intermediation) based on banks, to a more, credit-based financial system based on capital markets (and eventually securities market). This especially allows for intermediating more large and long term funding that is typical of financing public goods. Typical Highway projects in India run into millions and sometimes billions of dollars, with gestation periods and time taken for projects to attain financial closure extending as long as 30 years; this therefore requires more stable financial markets.

4 Unbundling Infrastructure Services: The Case of National Highways Authority of India (NHAI)

4.1 Introduction

In India the public sector has been the main provider of basic infrastructure in India. However, public financing as mentioned in earlier chapters has already limited and further decreased by the deficit reduction provisions of the FRBM Act 2003, and it will not alone be able to generate the needed levels of investments (US$475 billion) to improve infrastructure facilities. According to the 11th Five Year Plan, the targeted average GDP growth rate of 9% during FY2007–FY2012 requires an increase in private investment for infrastructure from the historical average of 6.5% per year to nearly 12.0% per year. Accordingly, the strategy of the Government for bridging the infrastructure deficit includes (i) revising policies and regulations across sectors for enhancing PSP in infrastructure development including through PPPs; (ii) enabling arrangements for bridging the enormous deficit in infrastructure financing especially for long-term funds through all possible sources; and (iii) strengthening the capacity at all levels for promoting PPPs for infrastructure development.

Figure 4.1 India Infrastructure Investment (as % of GDP)



Source: Broker research gross capital formation in energy, airports, seaports, roads and telecom has been used as a proxy for infrastructure spending.
(http://www.idfcprojectequity.com/investments/india_infrastructure_opportunity.htm)

The Government expects the shares of public and private investment through PSP including PPP in total infrastructure investment during the 11th FYP to be 70% and 30% respectively, compared to 83% and 17% respectively during the 10th FYP. Financing from multilateral and bilateral institutions during the 11th FYP are expected at around US$40 billion to supplement resources raised in domestic and international markets (ADB, 2007, p. 2). While the Government has pursued reforms for establishing a framework conducive for infrastructure development and broadening the range of financing modalities, significant scaling up of infrastructure investments still faces formidable challenges in the real and financial sectors. While PPP is emerging as the preferred mode for infrastructure development, capacity constraints will have to be addressed for transforming the potential for PPPs into a stream of bankable subprojects. This risk is being dealt by intensive support from ADB and other

development partners for mainstreaming PPPs. In addition, upfront identification of potential subprojects for the first PFR of the Facility has been made.

Table 4.1 Comparison of Infrastructure Available in India

Item	Population (million)	National Expressways ('000 miles)	Major Airports	Electricity Production (billion of kWh)	Port Shipments (billion tons)
India	1,100	3.7	17	652	0.4
PRC	1,300	25.0	56	2,500	2.9
United States	300	47.0	189	4.000	1.4

kWh = kilowatt-hour, PRC = People's Republic of China.
Sources: International Monetary Fund, United States Energy Information Administration, Morgan Stanley, China National Development and Reform Commission, and National Council of Applied Economic Research (India).

Source: ADB 2007

The adverse impact of drop in the momentum of mainstreaming PPPs have been mitigated at the macro level through positive incentives that are provided by the Government for enhancing the bankability of infrastructure sub-projects. In addition, state governments are proactively reducing constraints to infrastructure development for promoting economic growth. Infrastructure reforms in broadly consist of the Government recognizes its important and expanded role in the changing economic and technological context for catalyzing PSP and PPPs in infrastructure development through

(i) Developing legal and regulatory frameworks and arrangements,

(ii) Planning and coordination,

(iii) Reforming institutions and developing partnerships among complementary institutions, and

(iv) Ensuring quality of infrastructure.

In pursuit of these, policy actions have been taken across sectors to encourage PSP, both through direct PSP and PPPs. These reforms are designed to reduce risks by enhancing the enabling environment, provide stability to long-term cash flows and assist in project appraisal to facilitate financing. Table 4.2 below summarizes the major infrastructure sector reforms (Appendix 2).

Table 4.2 Major Infrastructure Reforms in India

Roads	• Model concession agreement for toll highways has been published. • The National Highways Act, 1956, has been amended to attract private investment in road development, maintenance, and operation.
Seaports	• A comprehensive national maritime policy is being formulated to establish the vision and strategy for the sector until FY2024. • Private sector participation including foreign direct investment in ports is being encouraged. • Establishment of tariff authority for major ports to regulate port tariffs.
Airports	• Major airports are being built or upgraded through PPPs. • The process of building 35 smaller city airports using PPPs has been initiated. • 100% equity ownership by non-resident Indians is permitted in airports. • The Airports Authority of India Act has been amended to provide a legal framework for airport privatization. • A new civil aviation policy has been tabled in the parliament proposing foreign direct investment of up to 74% in domestic carriers.
Urban Infrastructure	• A model municipal law has been developed to help states and urban local bodies enact reform legislation and to facilitate the development and disposal of excess land. • The Urban Land (Ceiling and Regulation) Act, 1976 has been repealed.
Railways	• Innovative pricing structures are being adopted for attracting new customers. • PPP-type initiatives are being considered for increasing capacity through the proposed dedicated freight corridors.
Power	• The Electricity Act, 2003 and the National Electricity Policy, 2005 have been designed to facilitate competition, reduce technical and commercial losses, and provide remunerative returns on investments. • The Central Electricity Regulatory Commission and 18 state electricity regulatory commissions have been established to regulate tariffs.

FY = fiscal year, PPP = public-private partnership.
Sources: Planning Commission, National Highways Authority of India, and Ministry of Power.

Source: ADB 2007

4.2 Theoretical Assumptions of Infrastructure Development and Investment

The most commonly understood definition of infrastructure has come to mean anything that is beneath (infra) the building (structure), and technically that now includes services or facilities that are on the surface (roads and railways) or underground (piped water and sewerage). Electric power, transport and telecommunications are often included as well, even though they their facilities are sometimes built well above the ground, but they still provide a supporting function to human productivity. In this regard the two most crucial aspects of infrastructure is network nature of these industries in distributing products or services over geographic space, and the monopoly nature of infrastructure industries in that they are usually provided by government and also termed as public utilities. The infrastructure service networks that are built are by and large capital extensive and the investments required are durable and immobile (implying that the network benefits and investment cannot be shifted to another geographical location).

Table 4.3 The Nature of Infrastructure Networks and the Role of the Government

The Nature of Infrastructure Networks and the Role of the Government
1. Monopoly, Network, and Economies of Scale Characteristic • The government has been a driving force and the main actor that has been involved in developing infrastructure services, and this is by and large the tendency as these infrastructure networks have the characteristics of a so-called natural monopoly, which are a combination of durable and immobile investments and strong economies of scale or traffic density (Ibanez-Gomez 2006). • This concern over monopoly eventually has lead government to either to provide infrastructure services itself or to regulate the prices and quality of service of private infrastructure companies. • Networks also imply that they essentially provide economies of scale, so that developing the infrastructure facility and services are provided by a single entity (by itself or contracted out), and costs could be reduced particularly when local network has a relatively low density of traffic. The durability and immobility of the investments increase the risk for new entrants to provide services where the incumbent is already operating; deriving the monopoly nature of infrastructure services. • Economies of scale also require large sale investment and long term funding that sometimes private sector cannot have access to (depending on the market). Thus might require government support in funding, regulation and
2) Rights of Way, and Eminent domain, Capture Issues • But government ownership and involvement in the provision of infrastructure services that often pre-dates and enhances concerns about monopoly, is the difficulty of assembling the right of way required to set up an infrastructure network. Where facilities from railroads, highways, and power, water, and telephone lines all require long, linear, and contiguous rights-of-way that would be difficult to assemble without the government's power to expropriate private property through the process of eminent domain. • Without the eminent domain, private landowners along the network alignment could easily bargain for high prices for key or missing links. In this regard, even if the government does not provide the infrastructure services directly it necessarily has to exercise its power of eminent domain on behalf of infrastructure companies, or allows the companies to place their pipes or lines in local streets or other publicly owned rights of way. • Governments on one hand are imperative in guaranteeing rights of way, but on the other hand they will always remain hesitant in delegating this eminent domain powers to private companies or to grant companies unrestricted access to local streets, for the simple fear these privileges will be abused under a monopoly environment (Capture). Moreover, the reluctance of the government to expropriate property and provide rights of way is understandable considering the fact that it can contribute intensify monopolization, by making it harder for a new company to enter the business and challenge the incumbent.
3) Services of General Interest, Universal and equitable access, Basic levels guaranteed by legislations • Another important justification for government involvement is that some types of infrastructure generate benefits beyond those that accrue to its immediate users or subscribers. For example, clean drinking water and sanitary waste disposal protect the general public from the spread of disease and the contamination of the environment.

Similarly, a lamp outside a private residence or business reduces the risk of accidents and crime for neighboring properties and passersby.

- If important benefits of infrastructure services accrue to nonsubscribers, then it may be difficult to persuade subscribers to pay voluntarily for the level of service that is socially desirable. Nonuser benefits have stimulated governments to promote infrastructure provision in a variety of ways. Most city governments contract directly with electricity companies for street lighting, for example, and compel all households and businesses to subscribe to piped water and sewerage services.
- Some of these services are also supposed to be provided by the state for its citizens to promote quality of life and basic standards of existence. This is also crucial as the state is responsible for providing public utilities in exchange for the tax that users pay. But as economies and their functions get more diversified a more user based approach infrastructure provision has also been emerging.
- Economic development and equity considerations are two additional and related motives for government intervention, and they also often enhance monopoly concerns. Infrastructure is viewed as an important to local economic development, and governments are often concerned about the infrastructure endowments of lagging or underdeveloped regions of their countries. Similarly, ensuring universal access to a basic level of infrastructure services is often thought to be important to the protection of equal opportunity for individual citizens, much as universal access to basic education and basic health care is. Infrastructure may not be deemed as essential or providing equal opportunity as education or health, but often considered critical for equitable development.

4. Larger Concerns that are not only profit oriented, Regulation and setting up standards

- Government involvement in infrastructure is also very crucial in reducing safety and environmental problems. Railroads, highways, and power lines present safety hazards to both users and nonusers, for example, while power plants, locomotives, and motor vehicles pollute the environment.
- To the extent that these risks fall on nonusers, the government often feels justified in regulating the harms on the public's behalf. And even if the safety and health risks fall on users, government intervention may be warranted if users are not well enough informed to judge the hazards that they are being ex- posed to.
- In most countries, the regulators in charge of safety and environ- mental concerns are separate from those responsible for controlling monopoly. The separation is designed to avoid any potential conflict of interest between setting tariffs and setting health and safety standards.

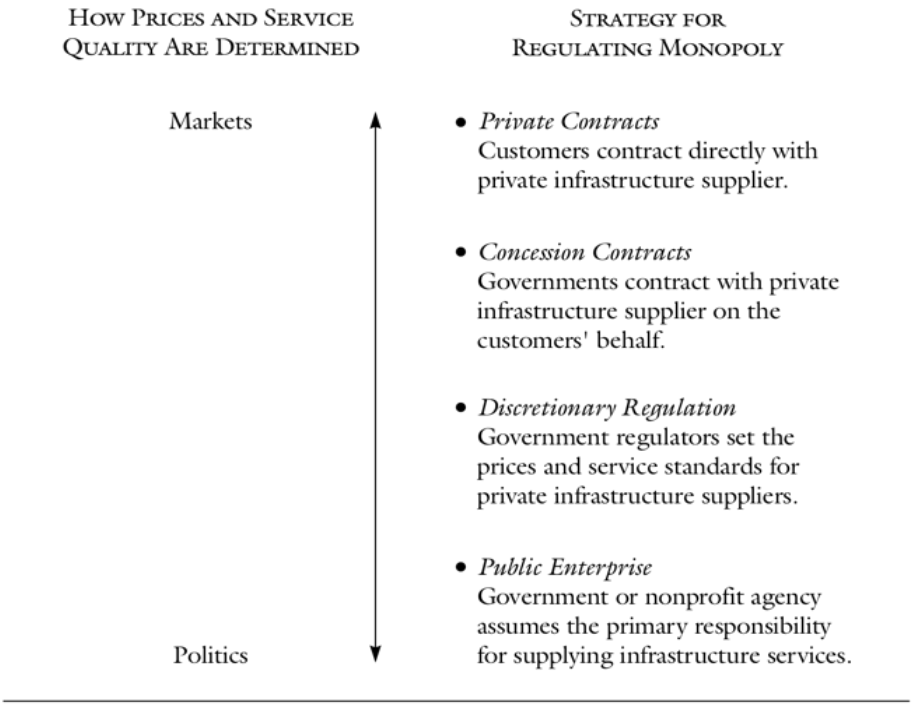
Source: Gomez-Ibanez 2004

As natural monopoly is the most important form of barrier to entry in infrastructure, another characteristic of natural monopoly are the large economies of scale in terms of providing the durable and immobile investments in establishing the barrier to entry. Economies of scale occur when average or unit costs of a firm fall as volume of producing a service product decreases, and this can enable one firm (as opposed to two or more in serving the entire market. This automatically has a larger firm bias, as the larger firms always have a cost advantage over a smaller one; so the larger firms has a natural tendency to win competitive biddings and provide services. This nature of firms, raises the need for a regulator that has to first of all protect itself from being captured (agency capture). As economies of scale mean that only one firm will serve the market at any given time, but they don't prevent "hit and run" competition from a challenger to the incumbent. If investments are short-lived or mobile, both the incumbent and the challenger have the option of exiting the market

and taking their investments with them, but as the investments are durable and immobile, bringing competition is difficult and exit of both firms from the market without losing its investments is natural. However both durable and immobile investments, and economies of scale, have become the defining characteristic of infrastructure monopolies.

According to Gomez-Ibanez (2003) there are four main groups or categories in which infrastructure can be provided. Where it can range from state provision through public enterprise provision on one extreme; and to direct private contracts between infrastructure companies and customers is the category in which the market plays the largest role and politics the smallest (in other words minimal regulation too). With private politics is defined in terms of policy as however the polity is involved as the legislature and the courts enact and enforce the laws that govern private commercial contracts. But within that general legal framework, infrastructure suppliers and their customers negotiate voluntary agreements about the prices to be paid and the quantities and qualities of services to be provided. Apart from these four main groups there are many variants and hybrids along the continuum, but most can be assigned to one of those outlined in Figure 4.1.

Figure 4.2 The Range of Solution to a Monopoly and the Options for Infrastructure Provision



Source: Gomez-Ibanez 2004

The next alternative is concession contracts, which has gained exceeding popular in different parts of the world since nineteenth century and it was rediscovered and improved in the late twentieth century. Under this scheme the government awards a private firm a concession or franchise to provide a specific infrastructure service for a limited period of time, typically ten or twenty years. The services the concessionaire must provide and the maximum tariffs it can charge are specified in the concession contract. The contract is usually awarded competitively, often to the bidder proposing the lowest tariff for a specified level of service. The government monitors the concessionaire's performance to make sure it is in compliance with the contract, but

neither it nor the concessionaire is supposed to unilaterally change the contract after it is awarded.

Concession contracts increase the role of politics as in effect the government represents consumers in deciding what combination of price and service quality would be best. The contracts between the private suppliers and governments are substituted for contracts between the suppliers and individual customers. Market forces still play a major role, because the concessionaire signs the contract voluntarily and the contract is not supposed to be changed subsequently without the knowledge of both parties. If the contract is awarded competitively, consumers have some assurance that the concessionaire's expected profits will not be excessive relative to those of firms in competitive markets.

The third alternative is discretionary regulation, which had been used extensively in the United States and Britain and has been applied selectively or done as a hybrid in many developing countries. The discretionary approach involves creating a government regulatory agency with the power to unilaterally establish the tariffs and service standards for the infrastructure firms to abide by. The legislation establishing the regulatory agency usually sets out the principles the agency must consider when making its decisions and the powers of the agency. And the agency's decisions can usually be appealed to the courts or some other tribunal on the grounds that it has not followed its statutory orders. The discretionary approach increases the role of politics further by abandoning the effort to describe all the commitments or making any direct contract between the government and the infrastructure company. The market is still importantly involved, especially as firms depend entirely or in part on private capital markets to finance their investments. If the regulatory agency's decisions are too harsh, the company will not be able to raise capital to replace worn-out facilities or to accommodate growth in demand. But to the extent that the assets are durable and provide adequate capacity, the consequences of harsh decisions may not be apparent for many years.

The final option is to give the responsibility for providing the infrastructure services to a public or nonprofit enterprise. Private firms might still be involved as contractors to the public agency, but the services contracted out will still be less than the period for a concession, and will also not be encompassing. And markets are still influential, but only minimal as they become restricted to the public agency's revenues determined by the prices consumers are willing to pay for its services while the agency's costs are affected by the prices it has to pay in the labor, equipment, materials, and other input markets. The main difference is that the enterprise responsible for the service is not owned and controlled by private investors, so that it may have less incentive to take advantage of its monopoly position by charging prices above costs. This form of infrastructure provision is usually present in developing countries, and it surely did exist for India especially before the pre-reform period.

With the shift from private contracts to concession contracts or discretionary regulation, however, the focus shifts from whether the market is fair to whether the government is fair (Gomez-Ibanez, 2003, p. 35). And as one moves from concession contracts to discretionary regulation, the difficulty of demonstrating fairness increases. The concession contract has a very important advantage in that it can be awarded through an open and competitive bidding process, which the public is likely to accept as fair. Critics though may object that the government should have set a different minimum service standard or maximum tariff when it drafted the concession contract, but if the contract is then awarded competitively it is harder to argue that the firm is making unreasonably high profits. As a result, the task of demonstrating fairness and maintaining public acceptance becomes much harder in discretionary regulation than it is with concessions.

Even with discretionary contracts the design of the regulatory agency also matters, as measures that insulate regulatory agencies by making them more

independent protect them from political influence allow the regulator to make decisions that are unpopular in the short run, including decisions that are not in the public interest but are more efficient or equitable in the long run. Finally, the broader institutional environment of the regulatory agency is probably influential as well. Legal systems and other institutions that protect private property may also help protect utility investors from abuse by regulatory agencies. Political systems with checks and balances (as in India) may make it harder to change regulatory regimes. As regulations are made under different circumstances and in different legal setting in each country it is still too difficult to say which is more effective among regulatory strategies. The institutional environments that seem helpful to private contracts or concession contracts seem to help discretionary regulation as well.

Concession contracts proved very popular, however, in the wave of infrastructure privatizations that swept the developing countries beginning by the end of the 1980s. Concession contracts were becoming the norm for the private-toll expressways, railways, electric power–generating stations, and water and sewage treatment plants that many countries established during that time. Concession contracts however are not too prevalent say with privatized telephone and electricity distribution companies, probably because those services seemed so complex that governments had little faith that they could specify the needed service standards or investment programs in advance. Or also the level of monopoly is comparatively lower, considering the amount of innovation and competition that telecom can garner. Concession contracts were appealing in developing countries precisely because they promised greater commitment from the private sector. The fear of regulatory capture and opportunism was often strong, particularly among foreign investors who were often being courted for their money and expertise.

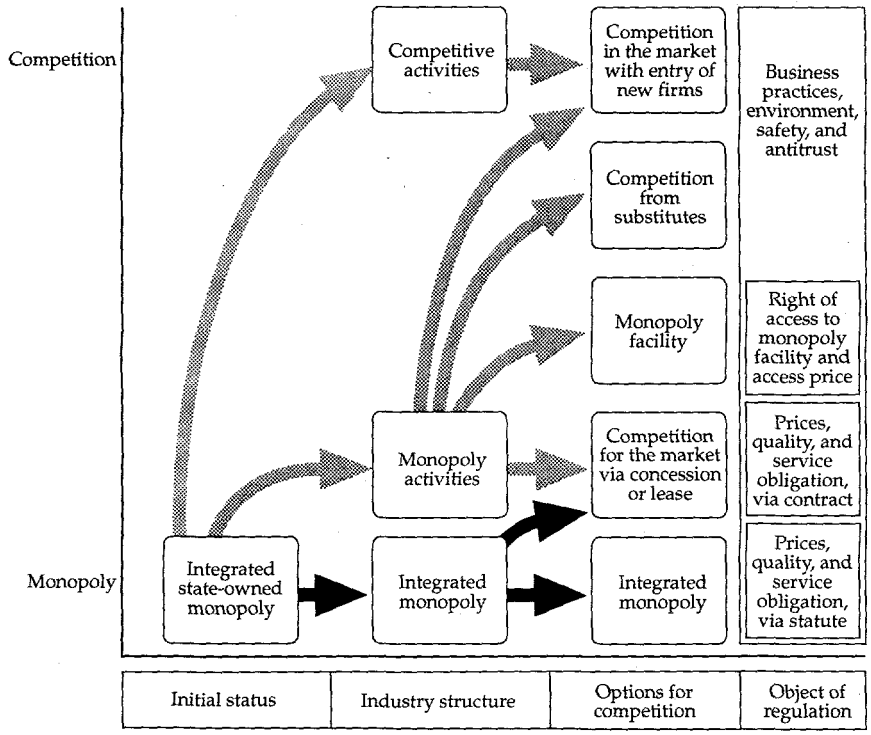
4.2.1 *Vertical Unbundling and Regulation*

What is popular with economics is when companies are horizontally separated they can serve different markets or regions, but vertically integrated in that they provided all the key array of functions needed to serve their regions. But governments began to vertically separate, or unbundle, their infrastructure companies in the 1980s at the same time concessions were getting popular. In most cases, the restructuring was part of the process of privatizing a government-owned utility. A well-known example being the case of Britain's privatization of its national railway in 1994, where it sold the railroad off as approximately seventy different companies.

Vertical unbundling was an outgrowth of the criticism of regulation in the United States in the 1970s and 1980s, and the motive was to reduce the need for regulation by introducing competition wherever technically possible (2003, p. 247). Unbundling is directly linked to regulation, whether or where unbundling proves to be worthwhile will depend importantly on our ability to solve the special regulatory issues it raises. At its core, unbundling involves a trade-off between the benefits from more competition and PSP and the costs from reduced coordination. How favorable that trade-off will be depends on how critical coordination is and how skillfully the regulator can promote it.

Figure 4.3 Unbundling Activities Increases the Options for Competition and Private Sector Development

Figure 1. Unbundling Activities Increases the Options for Competition and Private Sector Development



Source: World Bank, 1994

If only parts of these industries are natural monopolies, then vertical unbundling can focus regulation on the parts that need it and allow market forces to govern the rest. But while unbundling reduces the range of activities that have to be regulated, it comes at the cost of making coordination between the different segments of the industry more difficult. After separation, by contrast, the coordination must be arranged largely through contractual arrangements between separate firms. The firms may have common interests in the success of the passenger service, but this could also get complicated as firms could also have conflicting interests regarding who should bear what costs and risks. The regulator here is crucial, as it becomes a third party to already complicated contractual relationships. One paradox of vertical unbundling is that the effort to substitute competition for regulation may actually increase the complexity, cost and importance of the regulator's task. That task seems easier in that the regulator can focus his attention on the fraction of the industry's activities that are monopolistic. But once vertically unbundled the regulator must now supervise complex relationships between the monopolistic and the competitive segments of the industry, and these relationships are critical to the ultimate quality and cost of service for the consumers.

4.3 Indian Infrastructure: Developments Across Sectors

The state of infrastructure in India has been a source of concern for local and foreign investors interested in tapping its potential as a business destination. Perceptions about Indian infrastructure are reflected in infrastructure rating

comparisons drawn with Brazil and China, which indicate that India has some way to go on infrastructure development before it can match countries at similar stages in development. The PRC spends seven times as much as India on infrastructure in absolute terms, spending US$150 billion in FY2003 on electricity, roads, airports, ports, and telecommunications, compared with US$21 billion India spent (Basistha, 2007, p. 33). In terms of percentage, China has been spending 10% of GDP on infrastructure, while it India it has been hovering at 5%. According to the CoI, as India aims to expand its economy at the rate of 8–9% in the coming years, infrastructure spending will have to reach around 9% of GDP. India had also established nodal agencies such as NHAI and Airports Authority of India has taken the lead in partnering with financial institutions to promote PPP.

Table 4.4 Economic Intelligence Unit (EIU) Infrastructure Development Ratings

	Brazil	India	China
2001-05 Rating (out of 10)	5.4	3.1	4.5
2001-05 Ranking	47	75	55
2006-10 Rating (out of 10)	5.9	4.1	5.4
2006-10 Ranking	49	75	54

Source: Economist Intelligence Unit, Country Monitor
Cited in: KPMG 2006

The Indian government has released two fiscal packages so far (December 7 and January 3) with an infrastructure focus with an announced funding is expected to support a PPP program of US$20 billion in the highway sector and port and power projects. In the December 7 announcement, India Infrastructure Finance Company Ltd. (a government-owned special-purpose enterprise) was authorized to raise US$2.1 billion by March 2009 to support financing of around 60 highway projects through PPP. On January 3, IIFCL was authorized to raise an additional US$6.25 billion in tax-free bonds for refinancing bank loans to infrastructure projects. Non-bank finance companies dedicated to infrastructure financing have also been allowed to raise funds from multilateral or regional institutions and are to be provided with additional liquidity of up to US$5.15 billion. For a fast-growing economy like India, a sustained growth rate of about 8–9% is feasible and necessary to maintain global competitiveness. The size of expected spending in the various sectors is provided below in Table 4.5.

Table 4.5 Infrastructure in India: A vast land of construction opportunity Projected spending from FY07-FY12 in selected infrastructure segments:

Infrastructure Sector	Projected Spending
Electricity	US$167 billion
Road and highways	US$92 billion
Railways	US$65 billion
Ports	US$22 billion
Airports	US$8 billion

Source: PricewaterhouseCoopers 2008

Table 4.6 Infrastructure Regulatory Agencies and Regulators in India

Industry Sector	Year Privatized	Legislation	Regulator
Telecom	1997 (amended in 2000)	Telecom Regulatory Authority of India Act, 1997	Telecom Regulatory Authority of India
Airports	1995 (to be replaced in 2009	Airports Authority of India Act, 1995	State owned Airport Authority of India (AAI, 1995), was replaced by the Airport Economic Regulatory Authority to be formed
Electricity	1998	The Electricity Act, 2003 (with amendment in 2007)	Central Electricity Regulatory Commission
Petroleum and Natural Gas	2006	The Petroleum & Natural Gas Regulatory Board Act, 2006	Petroleum and Natural Gas Regulatory Board (PNGRB)
Highways	1988	National Highways Authority of India (NHAI) Act, 1988	NHAI was only operationalized in 1995
Water	1997	Constituted under the Environment (Protection) Act, 1986	Central Ground Water Authority: that only regulates and controls, the development and management of ground water in the country. (New regulator to be proposed)
Railroads	None	None (Although PPP's to be implemented on Dedicated Freight Corridor and City Metro Systems and Rail Modernization)	Indian Railways Regulatory Authority (proposed) with an Indian Railways Corporation (proposed under Rakesh Mohan Committee Report)
Ports	1997 (to be replaced in 2009)	Major Ports Trust Act, 1963 was amended by Port Laws (Amendment) Act 1997	Tariff Authority for Major Ports (TAMP, 1997) to be replaced Major Ports Regulatory Authority (2009)

Source: Compiled by the Author, from relevant websites including Planning Commission, TRAI, AAI and livemint.com accessed on 25th May 2010

4.4 Infrastructure Financing in India

The infrastructure finance market in India is largely characterized with inadequate flow of long-term funds despite a growing market and diversified instruments in the financial sector as the last section explained. The availability of funds from the domestic market is typically range only for 10 years or less with a 2–3 year re-set clause, in effect making them short term financing. This typically leads to front-loading of tariffs during the initial years of the project cycle, which in the end could adversely affects affordability of the services for the low-income end-users. But this could also make private sector weary of entering the market in case there are price-cap regulations as in the case of National Highways. Since user tariffs are required to provide for debt repayments, return on equity, and depreciation costs, tariff affordability depends on debt amortization through smaller repayments over a longer

period of time. In the absence of long-term fixed rate financing, stability of cash- flows are difficult to achieve as the table below suggests.

Table 4.7 Financing Sources for Infrastructure Projects

Domestic Sources	External Sources
Equity	
• Domestic developers (independently or in collaboration with international developers) • Public utilities (taking minority holdings) • Other institutional investors (likely to be limited)	• International developers (independently or in collaboration with domestic developers) • Equipment suppliers (in collaboration with domestic or international developers) • Dedicated infrastructure funds • Other international equity investors • Multilateral agencies
Debt	
• Domestic commercial banks (3–5 year tenor) • Domestic term lending institutions (7–10 year tenor) • Domestic bond markets (7–10 year tenor) • Specialized infrastructure financing institutions	• International commercial banks (7–10 year tenor) • Export credit agencies (7–10 year tenor) • International bond markets (10–30 year tenor) • Multilateral agencies (over 20 year tenor)

Source: Planning Commission, Government of India.

Source: ADB 2007

With the absence of long-term debt market in terms of corporate debt market, asymmetric information on infrastructure projects, and inherent risks in financing infrastructure projects further impedes infrastructure investment. Another anomaly that occurred when development finance institutions (DFIs) were converted into commercial banks cut the long-term funds that had been a major source of long-term finance, during the pre-reform period. In general, although studies and reports have been calling for more reforms in the market to support commercial banks raise funds in the market (that is Infrastructure based mutual funds), in general they still have limited experience in infrastructure financing. As the scope of financial intermediation was already covered in the last section, just the details of one Government SPV is worth mentioning here:

Table 4.8 Facts on India Infrastructure Finance Company Ltd.

IIFCL was established on 5 January 2006 under the Companies Act, 1956 as a Government-owned SPV specifically in the context of the magnitude of infrastructure investments required and very limited supply of long-term resources and the need to catalyze financing for PPP projects.

- Central to Government's PPP development strategy, IIFCL's establishment has been extensively deliberated within the Government and with experts such as the Patil Committee and international and domestic financial institutions. Asian Development Bank (ADB) and the World Bank have extended support to ensure IIFCL's autonomy and commercial orientation.
- IIFCL has a lean capital and operating structure with paid-in capital of US$76.3 million and authorized capital of US$225.3 million. IIFCL is expected to raise
  - (i) Rupee debt of 10-year maturity and beyond,
  - (ii) Debt from bilateral or multilateral institutions, and
  - (iii) Foreign currency market borrowings.
- IIFCL's market borrowings are government-guarantee to encourage funds resident in long-term financiers such as insurance and pension funds to invest in infrastructure. IIFCL's operating paradigm, the Scheme for Financing Viable Infrastructure Projects through IIFCL (or the Scheme) was approved by the CoI chaired by the prime minister.
- Pursuant to its Scheme, IIFCL will provide long-term debt financing at commercial rates for stand-alone non-recourse infrastructure projects or projects that are units of larger corporate entities. While IIFCL can fund both public and private sector projects, it prioritizes PPP projects selected through transparent and competitive bidding and assessed for commercial viability. IIFCL is expected to catalyze and promote PPPs by leveraging market-based project development skills and providing much needed long-term debt for financing infrastructure projects. This includes:
  - (i) Extending support to infrastructure projects in partnership with institutions like IL&FS, IDFC, and National Highway Authority of India;
  - (ii) Considering PPP projects at the state and municipal levels for example, roads, urban development, ports, tourism related infrastructure;
  - (iii) Providing financial instruments for enhancing investments in infrastructure, for example guarantees, debt, and equity; and
  - (iv) Establishing market benchmarks.
- Accordingly, the Government has also designated IIFCL as the debt manager of a US$3 billion debt fund of the US$5 billion India Infrastructure Financing Initiative. IIFCL, in partnership with Blackstone Group, CitiGroup, and Infrastructure Development Finance Company (IDFC) are investors in the US$2 billion equity fund of the India Infrastructure Financing Initiative. Further, IIFCL and 3i Group plc. have entered into a strategic partnership for equity and long-term debt financing for projects in power, port, airport, and road sectors.
- IIFCL is also expected to be the lead agency in using India's foreign exchange reserves to finance infrastructure projects. Under this arrangement, IIFCL has been given in principle approval for setting up two offshore SPVs which will borrow funds from RBI and lend to Indian companies implementing infrastructure projects, or to co-finance their external commercial borrowings for such projects solely for incurring expenditure outside India

Source: ADB 2007

4.5 Roads and Highways Sector in India

Table 4.9 Interesting Facts about the Road, Highway and Transport Sector in India

- India has an extensive road network of 3.3 million kilometers (km), 2nd largest in the world, carrying 61% of the country's total freight and 85% of total passenger traffic. The growth in road traffic has been at the expense of railway traffic.
- Of the 45,000 km of National Highway only 7% of were four-lane, 58% two lane, and 35% single lane.
- The 2000 to 2006 period saw India undertake a series of large size infrastructure development programs. These included the beginning of the ambitious National Highway Development Program (NHDP) in 2000 to strengthen the country's road network. In 2004 the government started its National Railways Development Scheme (NRDS) to improve the country's railway network. (to be discussed later).
- Until the late 1990s the National Highways suffered from poor funding, inefficient institutional framework for development and maintenance
- The Indian Government, via the NHDP, is planning more than 200 projects in NHDP Phase III and V to be bid out, representing around 13,000km of roads. The average project size is expected to US$150 million-US$200 million. Larger projects are likely to reach the US$700 million- US$800 million range. About 53 projects with aggregate length of 3000km and an estimated cost of around US$8 billion are already at the pre-qualification stage.
- The procurement process favors players with good experience and sound financial strength. Apart from the National plans, there are more than 10 states are also actively planning the development of their (state) highways. While the average size of these projects is smaller than the NHDP projects, most will still be substantial, in the US$100 million- US$125 million range. All told, more than 4,500km of state highways are likely to be awarded by the end of 2010.
- Projected annual growth over the 11th FYP is 12–15% for passenger and 15–18% for cargo traffic. World Bank estimates indicate that over the next 10 years, there will be a need to widen 15,000 km of national highways from two to four lanes, and a further 16,500 km requires upgrading from intermediate to two lanes.
- Estimates suggest that about 25,000 km of state highways need widening. An estimated US$50 billion–US$60 billion investment is required over the next 5 years to improve road infrastructure. The cumulative funding shortfall from defined road user charges over the next 10 years is estimated at US$25.66 billion, or 39% of total requirement

Source: Bordia 2006, Basistha 2007, PricewaterhouseCoopers, 2008

4.5.1 *The History of the National Highway Sector in India and Its Financing*

There was a rapid increase in use of roads for traffic and freight over the last five decades, where in 1950-51, road sector accounted for 13.8% of freight and 15.4% of passenger traffic (Singh D. , 2006, p. 6). Recently the roads carry 70 % of all freight and 85 % of passenger traffic, highlighting the fact the roads has become the preferred mode of transport. Moreover, the National Highways / Expressways although only accounting for about 66,590 km (2% of all roads) and carry 40% of the road traffic (Committee on Infrastructure, 2006). With India boasting the second largest network of roads, most of them are two-lane with high traffic, low service and slow speeds Table 4.10. In terms of investment during the 5 year period till 2012, Rs.225,000 crore[1]

[1] (IndE) ten million

(US$50 billion) is to be spent on highway improvements, and Rs. 70,000 crore or US$15.6 billion) on rural roads, through the Pradhan Mantri Gram Sadak Yojana (PMGSY) to connect villages.

Table 4.10 Indian and Highway Road Sector

Indian Highways and Road Sector	Length (km)	Percentage
National Highways	66,590	1.98
Expressways	200	0.01
State Highways	1,31,899	4.00
Major District Roads	4,67,763	14.00
Rural Road	26,50,000	80.00
Source: NHAI 2006		

The management and financing of roads and highways is now being revisited and it has become yet a new issue for governments. Although until recently different countries had adopted different approaches towards developing and financing roads, more than often it was a variation of the traditional approach. Theoretically put, the traditional approach has treated roads much like a public good where it was being financed from general government revenue. This was characterized by hardly any relation between the costs of road provision and the taxes or charges paid by road users (though fuel is often heavily taxed for general revenue purpose), and there was no attempt at direct road pricing. The more recent approach being the commercial approach, governments are now more often dealing with roads as a business sector. Roads are now being treated as a capital asset, commercial accounting is applied and users are charged, either directly or indirectly, for their use of the roads. Road transport remains a source of general revenue, but taxes are designed to minimize distortions to transport patterns or choices. In some countries, road finance is being separated from general government expenditures and road users are increasingly involved in decision-making.

The traditional approach has largely persisted in India, not until recently national and in some states fuel cesses[2] have been introduced, tolls are increasingly applied and substantial private sector financing is also becoming a trend especially in the highway sector. According to the World Bank (2004) study India is categorized to be in early in a transitional stage between the traditional and commercial approaches. But the study also notes that the present structure of financing contributes to the under-funding of road maintenance, a distorted vehicle fleet, unreasonable incentives for traffic allocation between road and rail, and substantial economic losses. But this trend was not restricted only to India, and the developments were also a part of a global awareness and standards arising from the experience that with government-run monopolies were once justified by the low production costs associated with large-scale operations and by the need to protect consumers from voracious private monopolies. But over time there was growing recognition that private initiative disciplined in part by regulatory forces and competitive market forces often has the upper hand in efficiently delivering infrastructure (Mody, 1996, p. xiii). By analyzing the way the Road sector was treated till the late 1980s directly under a National Planning Commission 5-year plans shows particular trends.

[2] Cess is the word used for Transportation Fuel tax (a uniform tax on petrol and diesel)

To get a picture of how the Roads and highways were developed in under the 20-Year Road Plans in India over the period 1941- 2001 refer to Table 4.11. As it can be observed that the National and State Highway Sector suffered the most in terms of expansion and development. Most of the expansion and development went into the district and rural road division, and this section will explain as to why this was so. Since Independence the Indian economy was based on Fabian Socialism, it was centrally planned with economy five year plans to guide policy, further it was financially repressed, controlled markets, import restrictions, and the state had much control over policy and implementation.

Table 4.11 Progress of Road Network (Thousand Km)

Targets and Achievements under 20-Year Road Plans (in Km)

Road Category	Nagpur Plan (1941-61)		Bombay Plan (1961-81)		Lucknow Plan (1981-2001)	
	Target	Achievement	Target	Achievement	Target	Achievement
National Highways	33,395	22,636	55,500	31,737	66,000	57,700
State Highways	86,825	62,052	112,650	95,491	145,000	124,300
Major District Roads	80,145	113,483	241,400	153,000	300,000	2,994,000*
Rural Roads (inc. ODR)	332,335	500,802	651,780	912,684	2,189,000	
Total	532,700	698,973	1,057,330	1,192,912	2,700,000	3,176,000

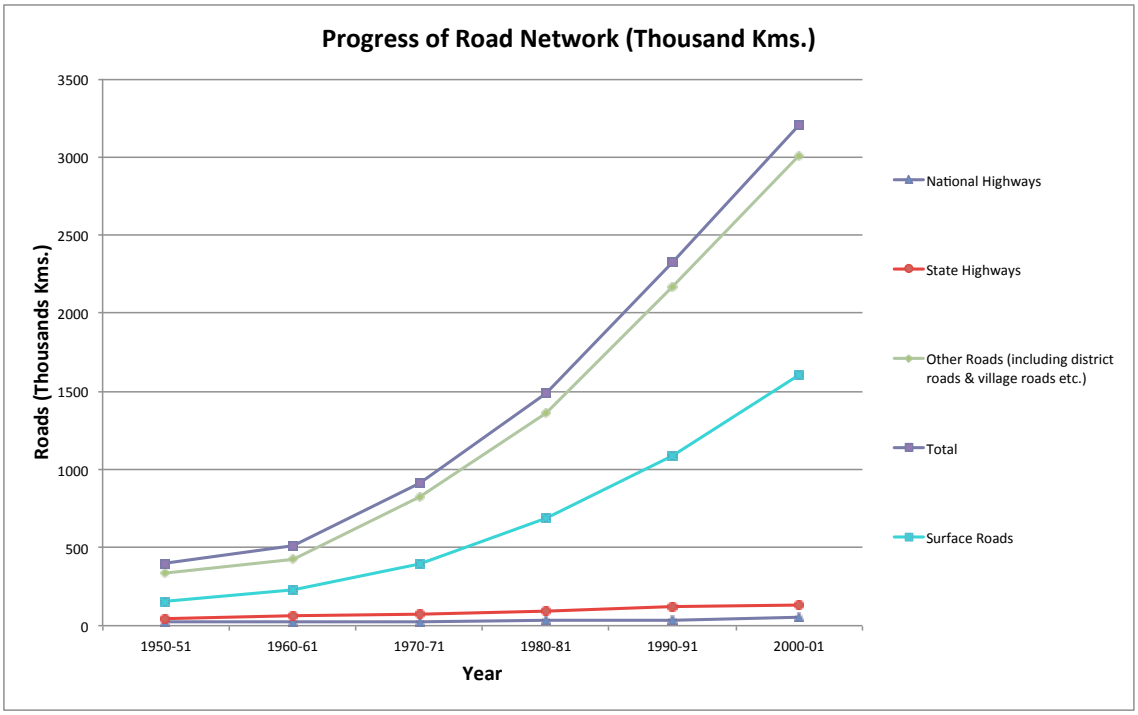
(* Includes 1,000,000 km of earth tracks, built under the employment generation programme)

Source: Lall and Rastogi 2007

Most of the Infrastructure developed during the 1950s and early 60s focused on expanding large multi-purpose and irrigation schemes. Building National Infrastructure was missing even during the second five year plan (1956-1961), as the strategic approach was to develop heavy and basic industries as part o an import substitution plan. Most of the 1950s and 60s was infrastructure development was characterized as being developed to complement the industrial development, more often in remote green field sites. It was not until the Indira Gandhi era, that substantial resources were allocated to roads, especially to rural roads. During the late 1960s and the 70s the rural road sector was given priority under the rationalization as part of transport sector development, but as it was a populist regime, and the political imperatives into channel funds rural India to build vote banks among the poor who could not benefit from village electrification ((Lall & Rastogi, 2007, p. 13).

The bulk of funds to rural roads came from The Minimum Needs Program as part of poverty alleviation program. During the mid 70s the, at the beginning of the 5th Five Year Plan (1974 – 1979) there was a proposal to link all villages with a population of 1500 and 50% of villages with a population of between 1000 and 1500 by all-weather roads, but unfortunately the implementation of these plans was poor and wasteful. Often these earthen tracks and gravel roads were hardly all-weather roads. In reality, the quality of the physical network of rural roads that were built was hardly comparable with the resources that were allocated to the effort during the 1970s and 1980s. Refer to Figure 4.4 that illustrates the 10-year data wise breakup on the development of different types of roads.

Figure 4.4 Progress of Road Network (Thousand Km)



Source: Basic Road Statistics, Road Development Plan Vision: 2021

During the Indira Gandhi era, infrastructure development was heavily politicized, this contrasted to the previous Nehru era where it was a part of economic strategic thinking. The Indira Gandhi era also saw an expansion of physical infrastructure for ground water irrigation and electricity supply that was needed to power the irrigation pumps continued during this period in spite of many State Electricity Board's financial deterioration and chronic power shortages. The political imperatives and the mostly inefficient and distortionary trends in providing electricity, roads, and irrigation services were passed on to Rajiv Gandhi's term. Although in the Rajiv's term there was a growing pressure to undo these previous distortionary effects, but fiscal constraints were more severe and the intellectual debate about the direction of administrative and organizational reform to improve efficiency in infrastructure was being ushered. Much of this research work was being done by committee's set up by the government, lending and multilateral institutions, which is finally said to have sped up the reform initiatives of the post-1991 BOP crisis period.

The next era of Decentralized Politics in the 90s financing constraint became the most severe in decades and it also started receiving exceptional coverage, due to the further intensification of shortages in the infrastructure sector and a growing body of knowledge of the benefits of infrastructure development on economic development and growth. As the nature of political power became more complex and diversified, this was complemented with a need for consensus building in policy making, demanding relevant empirical research. The India Infrastructure Report (NCAER , 2006), under the chairmanship of Rakesh Mohan, was a pioneering work with many recommendations being incorporated into the several budgets of the Eighth Plan (1992 – 1997). Until the 1980s the shortage of physical infrastructure particularly in the context of sustaining a GDP growth rate of 5% was not properly acknowledged.

Table 4.12 Chronology of Legislations and Regulatory Arrangements Related to the Indian Highway Sector Development

1851	Indian Tolls Act
1894	The Land Acquisition Act
1940	Dispute Settlement Act
1956	The National Highway Law (allowing for Land Acquisition and Tolls among others) and National Highway Act of 1965,
1957	The Department of War Transport was re-named as Ministry of Transport & Communications and the Department of Transport was placed under it.
1958	In 1957, the chief -engineers (road and bridges development) of the Central and the state governments met in Bombay 20-year, and subsequently presented the Road Development Plan (1961-81) in 1958, is popularly known as the Bombay Plan.
1966	In the President's order of 25 January 1966, the Ministry of Transport was re-named as the Department of Transport, Shipping and Tourism in the Ministry of Transport and Aviation.
1967	The Ministry of Transport and Aviation was bifurcated into the Ministry of Transport & Shipping and the Ministry of Tourism & Civil Aviation w.e.f. 13 March, 1967.
1978	National Transport Policy Committee, set up in 1978 under the chairmanship of B. D. Pandey, submitted its report in May 1980. It recommended 37 roads with a 12,955 km length for inclusion in the National highway network. Out of these, only 11 roads, aggregating 3,595 km length, were completed over a span of one-and-a-half decades.
1981	Another Road Development Plan (1981-2001), known as the Lucknow Plan of the Indian Road Congress, has made a case for 66,000 km of National Highways by 2001 A.D
1985	The Ministry of Transport & Shipping became the Department of Surface Transport under the Ministry of Transport with effect from 25 September 1985.
1986	The Department of Surface Transport under the Ministry of Transport was re-named as the Ministry of Surface Transport with effect from 22 October 1986.
1988	NHAI Act and the Motor Vehicles Act
1987	Establishment of the National Highway Authority of India
1991	Asian Development Bank-aided study in February 1990 on Development of Long-Term Plan for Expressways in India. The study was completed in 1991 and it recommended development of 10,020 km of expressways by 2015 at an estimated cost of Rs 580 Billion.
2000	Central Road Fund Act The Ministry of Surface Transport was bifurcated into two Ministries viz., Ministry of Shipping and Ministry of Road Transport & Highways with effect from 17 November 2000.
2004	Highway development overseen by the Committee on Infrastructure under the chairmanship of the Prime Minister. The Ministry of Road Transport & Highways and Ministry of Shipping were merged on 2nd September, 2004 into a single Ministry of Shipping, Road Transport & Highways, with two Departments – Department of Shipping and Department of Road Transport & Highways.
2009	Plans to develop an Expressway Corridors and create Expressway Authority
2009	The CoI, under the Chairmanship of the Prime Minister, replaced by Cabinet Committee on Infrastructure on July 6, 2009
2009	B.K. Chaturvedi Committee on National Highways Development Programme

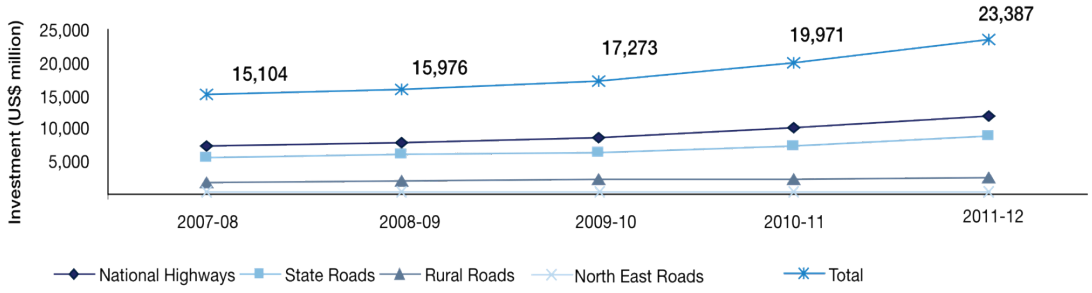
Source: Compiled by the Author, from relevant websites including MoRTH, TCIL and livemint.com

By the 1980s it was already observed that the volume of the increased traffic was being borne increasingly by the national highways, in spite of its small share of the overall road network in the country. It was not until 1971, that there was a realization to increase the National Highways by 8,000 from an existing 24,000 km,

while the length of overall road network was 915,000 km Table 4.5. But it was not until the post -1991 period that the case of transportation infrastructure became a good example of effective targeting of public spending especially during the Ninth Plan (1997 – 2002). In 1993 a Task Force on Infrastructure of government and industry representatives was constituted under the Deputy Chairman of the Planning Commission Jaswant Singh, with the aim of attracting investment to specific projects of national and regional importance, and ensure their execution and timely completion. The Task Force dealt with the developing and determining innovative methods of financing the Six lane expressway of 7,000 km of North-South and East-West corridor project, and the Four-laning of National Highways project.

The Ninth Plan was crucial when it came to the management of the infrastructure deficit under fiscal constraints, it sought to do this through organizational, management, structural, or in some cases, legislative reforms where were designed to improve operational efficiency, cost recovery and financial viability in key infrastructure sectors, and attract private capital into them (GOI 1993). The Ninth Plan had also recognized the unbalanced modal use in the transport sector, with a disproportionate reliance on congested national highways vis-a-vis rail. This awareness not only increased the operational efficiency of the Indian Railways, but it also led to targeted spending on the national highway network under the NHDP with Golden Quadrilateral (GQ, Phase I) and the related North-South and East-West Corridors (Phase II) under the Tenth Five Year Plan (2002 – 2007). To summarize the developments during the post-1991 period it is important to note the growing pressures of "neo-populist" coalition politics and the binding fiscal constraints that has forced a reduction in government spending on infrastructure on the one hand but there is marked improvement in the targeting of that spending, sustaining the path of gradual structural reforms to improve the sector's efficiency and induce private investment on the other. To top it all off there has emerged a strategic focus to infrastructure policy, with a growing emphasis on empirical policy oriented research in the sector (Lall & Rastogi, 2007, p. 19).

Figure 4.5 Projected Investment in the Road & Highways Sector in the Eleventh Plan



Source: PricewaterhouseCoopers 2008

Table 4.13 Road Infrastructure Detailed Projections (US$ Million)

	National Highways				State Roads (Highways, Major District Roads, Other Roads)			Rural Roads	North East	Total
Year	NHDP[1] Public	NHDP Private	Non-NHDP (Public)	Total	Public	Private	Total			
2007-08	3,173	3,702	463	7,338	4,347	1,333	5,680	1,875	212	15,104
2008-09	3,305	3,966	486	7,757	4,528	1,428	5,956	2,025	238	15,976
2009-10	3,464	4,495	510	8,469	4,745	1,618	6,364	2,150	291	17,273
2010-11	3,834	5,685	536	10,055	5,253	2,047	7,299	2,300	317	19,971
2011-12	4,707	6,478	563	11,747	6,488	2,345	8,834	2,463	344	23,387
Total	18,483	24,326	2,557	45,365	25,361	8,771	34,132	10,813	1,401	91,711

Source: (PricewaterhouseCoopers, 2008)

4.6 The National Highway Development Program: An Example of Infrastructure Unbundling

The Union Government through Ministry of Shipping, Road Transport and Highways (formerly Ministry of Surface Transport) was responsible for the maintenance and development of the highways until the National Highways was constituted. The NHAI was constituted by the Parliament with the enactment of NHAI Act in 1988, which was subsequently put into operation in February 1995. NHAI charter requires it to act on business principles, and the first project was only taken up only in 1998. The NHAI is evolving in its role and it is being strengthened to make it multidisciplinary body by establishing a dedicated setup for Public Private Partnership by creating separate cells for:

Project Appraisal	-- Monitoring
Planning	-- Quality Assurance
Standardization and R&D	-- Contract Management
Legal and Arbitration	-- Road Safety.

Later in June 1995, the GoI further reformed the legal framework that would pave the way for PSP in development of National Highways, with the amendment of National Highway Act, 1956 in June 1995. This Act finally enabled the private investors to levy toll and allowed participation of the private sector in construction, maintenance, and operation of National Highways. Since then the Government has been involved in other institutional reforms and in augmenting fiscal incentives to involve the private sector in road development. The main enactments according to Singh and Kaladindi (2006) included:

- The Road sector being accorded the status of an industry via Section 18 (1)(12) of the Infrastructure Act
- Establishment of Infrastructure Development Finance Company (IDFC) that would function as a Special Purpose Vehicle (SPV) to meet the long-term financial needs of the infrastructure sector
- Foreign equity participation of 100%, subject to a ceiling approximately US$300 million)
- Highways projects involving widening of existing highways are exempted from environmental and forest clearances.
- Guidelines for development of road projects through BOT to simplify the procedures concerning initial feasibility studies, acquisition of land, relocation and resettlement of affected establishments, environmental clearances, and equity participation in the highway sector.

- PPP project promoters are allowed to raise external commercial borrowings up to 30% of the project cost.
- Separate Model concession agreements for projects costing of less/more than approximately US$20 million that are to ensure uniformity in the various agreements for PPP road projects.

But it was not until the later in 1998 when the Task Force that announced construction of North–South and East–West (NSEW) corridor also recommended the need for connecting the four metro cities of Delhi– Mumbai–Chennai–Kolkata–Delhi, termed as GQ. This was a significant to the political economy as not only was the traffic volume highest between these four metropolises it would also connect the four corners of India. In 1999 the NHAI was given charge with implementing the ambitious NHDP, with the first two phases GQ and NSEW, in January. This Program was estimated to cost US$13.2 billion (in 1999 prices), and NHAI was expected to involve the private sectors in certain stretches of the National Highways drawing US$1 Billion (in 1999 prices) in private investments. Although the NHAI initially sought to allow PSP through the conventional BOT -Toll scheme, where private investments were to be recovered through tolling the road users, it had to introduce the BOT – Annuity PPP model. This was due to the poor response by the private sector in entering BOT – Toll Concession model, as the private investors' were not ready to assume the traffic revenue risk.

Although the since the late 1990s of the PSP regime, the Government had introduced new policies by offering fiscal incentives to overcome poor PSP, private investors remained skeptical due to the high upfront capital investment, overestimation of the traffic and public dislike for tolls as in high risks of revenue collection have been amongst the factors. The inaccuracies in accounting historical traffic data by the concerned public authorities and time span constraints during the project proposal process have been perceived to be key concerns of the private investors to BOT road projects in India. In general the perception of road users in India as in other developing countries that roads are a public good, and high taxes levied on users to fund road projects through the traditional public procurements process have made them unaccustomed to pay toll for using road. This causes users to avoid using the tolled roads by diverting onto the existing and alternate inefficient un-tolled road. The estimation of the users' willingness to pay during the economic appraisal period has been also been a challenging exercise in developing countries where there are no or limited toll networks and the income and income inequalities are undergoing transition (other words the elasticity of transport demand)(World Bank, 2001.) .

Overarching Policy framework of the NHDP has been to increase the viability of projects through private sector financing efficiency in executing the different phases of the NHDP. The NHDP is now being closely watched by the political machinery, it fact Prime Minister's COI constituted in 2004 is managing policies and monitors the key developments in the national highway sector. The Planning Commission's Five Year plans also integrate the NHDP plans in order to ensure time-bound creation of world class infrastructure, and to maximize the role of PPPs. The CoI with its report on Restructuring of NHAI (2008) is seeking institutional strengthening and greater autonomy of the NHAI with the view to increase its expertise in financing and contract management especially investing of about US$55 Billion over the next eight years. Since the Union cabinet has approved these recommendations of the report, hopefully this will usher in a new chapter of NHAI management. The NHAI has a mandate of undertaking seven phases of the NHDP, the plan of each phase is in Figure 4.6 (also refer to map in appendix for further details) and as of recently the status updates are summarized in Table 4.14.

Figure 4.6 NHDP: Implementation of the Seven Phases

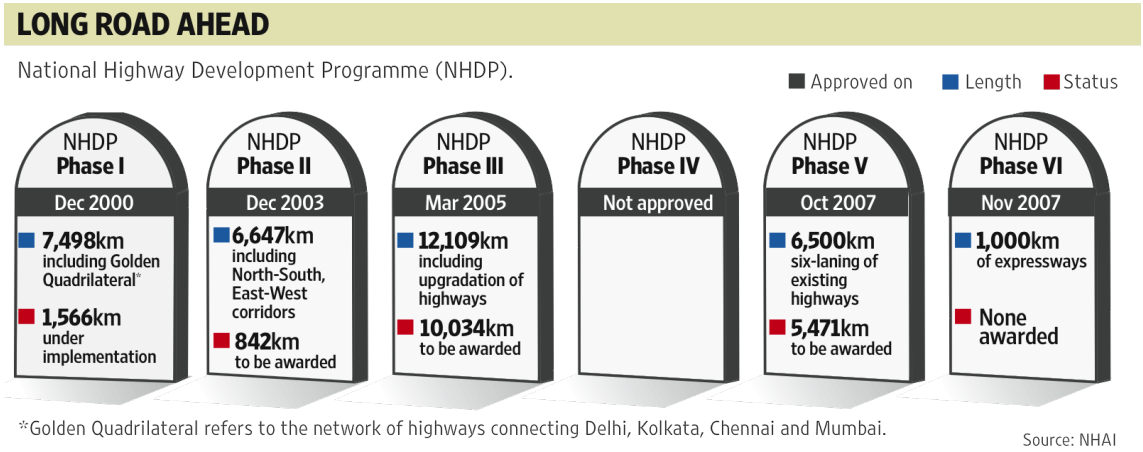


Table 4.14 NHDP and NHAI Project Latest Status

NHDP & Other NHAI Projects (Status :31st March, 2009)								
	NHDP					Port Connectivity	Others	Total by NHAI
	GQ	NS - EW Ph. I & II	NHDP Phase III	NHDP Phase V	NHDP Total			
Total Length (Km.)	5,846	7,300	12,109	6,500	31,755	380	962	33,097
Already 4-Laned (Km.)	5,721	3,436	787	106	10,050	206	781	11,037
Under Implementation (Km.)	125	2,915	1,878	928	5,846	168	161	6,175
Contracts Under Implementation (No.)	15	127	28	2	172	8	13	193
Balance length for award (Km.)	-	791	9,444	5,470	15,705	6	20	15,731

Source: NHAI 2009

4.7 Conclusion

Infrastructure services, (services that essentially have elements of natural monopoly) were generally provided by the state in most developing countries, to ensure equitable access to and distribution of public assets. Apart from all the essential characteristics of public goods, the role of the public sector is crucial in setting minimum quality standards and maximum access charges, to ensure benefits over cost to the public. These considerations compels the public sector to 'unbundle' infrastructure services either vertically or horizontally to spread risks, promote allocative efficiency in financing, service expansion and open up discretionary regulation (or enter into private or concessionary contracts) with private developers. India being a gradual reformer, in unbundling infrastructure services it has unbundled several of the sectors, especially power, highways, telecom, ports and airports by establishing independent authorities and allowing private participation, with a planned investment of $475 Billion during the 11th Plan (2007-2012) of which 30% is to be private investments. The National Highways was eventually vertically unbundled, and an independent authority (National Highway Authority of India) was established to implement the Development Plan in 7 phases (NHDP) to develop over 45,000 km of national highways and expressways by entering into concession contracts (BOT - toll, BOT - Annuity, or EPC). Developing and financing the National Highways before the reform period (pre-1991) was done the traditional way, and investment in national and state highways suffered in the light of popular politics which encouraged development of district and village roads especially to connect small villages. It was only the era of decentralized politics that led to a more concerted national highway development program and investment, which almost halved the investment in all roads and highways during the 11th Five Year Plan (around US$ 45 Billion of US$ 92 Billion).

5 Analysis of the Indian Highway Development Financing

5.1 Introduction: Recent Trends in National Highway Financing

The NHAI over the last ten years has been overseeing and financing the the different phases of the NHDP with government ear marked assured funding through oil cess, World Bank/ADB loans, road tolls (or other user charges), market borrowings, budgetary support and viability gap funding through SPVs. For the financial arrangements made for the Phase I and II of the NHDP refer to **Table 5.1**. These two phases had excessively relied on borrowing and the assured funding through cess, and the type of contracts were mainly Construction Contracts and initially Annuity projects gaining prominence, but over time the number of toll projects increased rapidly. The Private sector and the use of other financial instruments like bonds were negligible.

Table 5.1 The Funding of the NHDP Phase I and II

Funding plan for the First Two Phases of NHDP	
Fund Type	Amount in Rs. Billion
Cess	200
World Bank/Asian Development Bank Loan Assistance	200
Market Borrowings	120
Private Sector	60
Total	580
	(US$12,608 Million)
Source: NHDP 2006	

Private contractors are involved in this scheme mainly through EPC contracts, annuity (BOT) contracts and BOT (Toll) concession agreements, each corresponding to a varying degree of financial obligations in the future for NHAI. The estimated total cost of all the seven phases and special road program can be seen Table 5-2. The Phase III, V and VI will be developed exclusively on BOT (toll) model. Economically less viable projects usually were funded by EPC or Annuity contracts, as the private sector did not want to assume financial risk and traffic risk. While the PSP took financial and all other risks in BOT Toll projects, with the public sector only assuming the political risk.

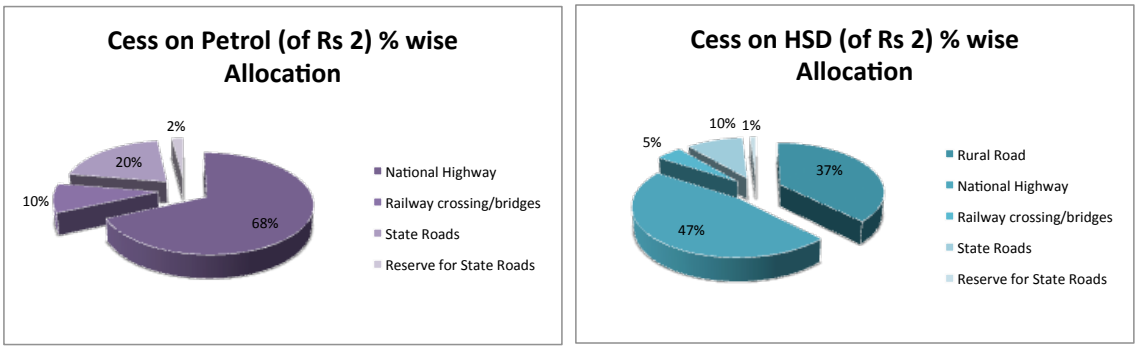
Table 5.2: NHDP Phases with Length and Estimated Cost

NHDP PHASES	Length (km)	Estimated Cost in US$ Billion
Phase I: Balance Work (GQ and Others)	1,738	2.15
Phase II: Balance Work (NS-EW Corridor and Others)	6,736	10.65
Phase III: four-laning on BOT- Toll	12,109	19.26
Phase IV: 2- laning with paved shoulders on BOT – Toll/ Annuity	20,000	6.80
Phase V: six-laning on DBFO, Toll	6,500	10.04
Phase VI: Expressways on DBFO, Toll	1,000	4.07
Phase VII: Ring Roads, Bypasses and so on, on BOT- Toll/ Annuity	-	4.07
Special Accelerated Road Development Programme in North East (SARDP-NE)	7,639	2.96
Total	55,722	60.00

Source: NHDP 2006

Like in many other countries India also eventually introduced a tax on fuel to directly finance the projects in the road and highway sector. This assured funding, the Central Road Fund was set up in 1998-99 to meet the challenges of accelerated funding requirement for all categories of roads in the country. This was legislated by the Union Budget that levied an additional excise duty and additional custom duty of Rs 1 per liter of petrol. Subsequently, in the Union Budget for the year 1999-2000, an additional duty of Rs 1 per liter on high-speed diesel (HSD) was also levied. Later in 2003-04 budget speech the then Finance Minister announced an additional levy of cess of 50 paise per liter each on petrol and HSD. The revenue that was generated from the cess would be used to finance all categories of roads. This fund was given a statutory status by Central Road Fund Act enacted in December 2000. Finally it was decided to levy and additional cess of 50 paise per litre on petrol and diesel for the year 2005-06 which was to be exclusively used for National Highways. The total cess levied on Petrol and HSD reached Rs 2, refer to Figure 5.1 to see the percentage wise breakup of the of the fuel surcharge.

Figure 5.1 The Allocation of Cess Revenue as % on Every Two Rupees Charged for a Liter of High Speed Diesel and Petrol



Source: Author's Calculations from MoRTH Data for Roads and National Highways 2009

The actual figures that went to different sub-sectors of the Highway/Road for the year 2007-08 as can be seen in **Table 5.3**, reveals that almost half the funding collected from the cess went into the National Highways. This maybe justifiable considering that the use of the National Highways is respectively higher than all other roads, but it does raise issues as to ways to measure proportionality, and it does raise the issue if levying the rural citizen for the NHDP is legitimate. Although according to the World Bank Study on, Highways in India (2004), the cess is still classified as relatively medium at about 10 - 30 US cents per liter, like many other developing countries, it does raise concerns as how long the government intends to impose this tax, and the future use of funds even as there will be increased private sector participation, rising toll incomes, and hopefully other financial instruments available for long term financing (that is bonds).

Table 5.3 CRF for 2007-2008 and 2009 - 2010

	Type of Roads	2007-2008 in Rupees	2009 – 2010 in Rupees
1	National Highways	65.41 Billion	85.78 Billion
2	Rural Roads	38.25 Billion	48.43 Billion
3	Railways	7.25 Billion	9.58 Billion
4	Grant to State Governments and UTs for State roads	15.65 Billion	20.70 Billion
5	Grant to States & UTs for Roads of Inter-State Connectivity and Economic Importance	1.74 Billion	2.30 Billion
	Total	**128.30 Billion**	**166.80 Billion**

Source: http://india.gov.in/sectors/transport/national_highway.php?pg=2 and (Government of India, 2010, p. 968)

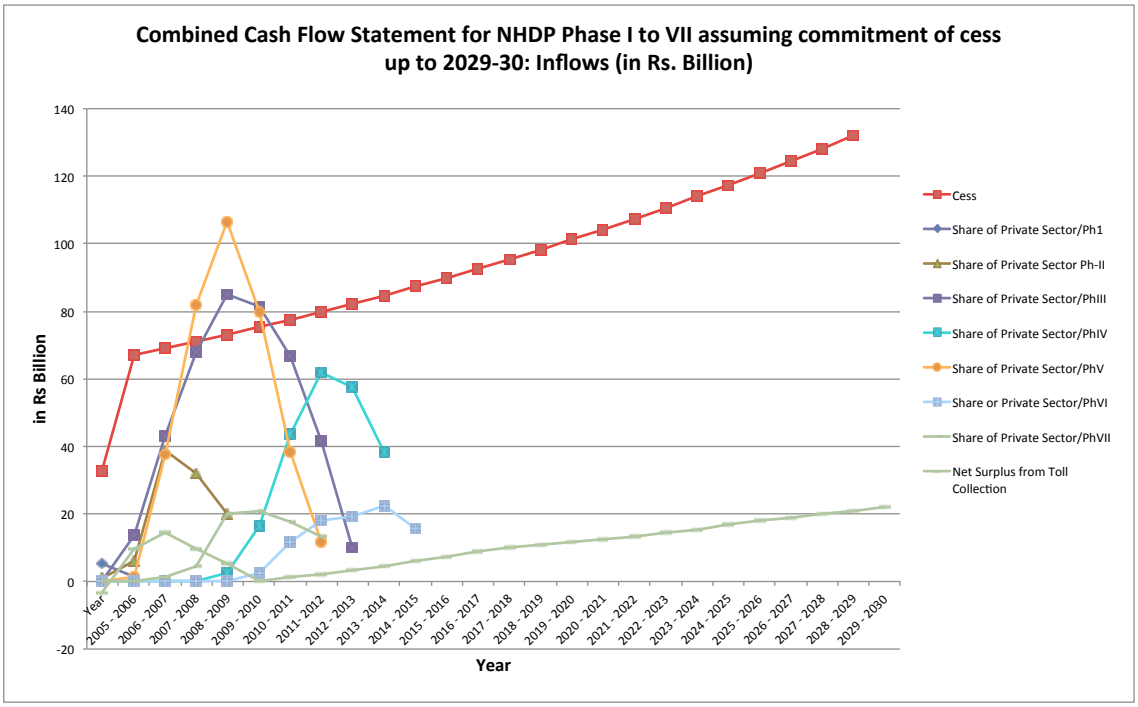
The CoI report on Financing Highways in India uses data that assumes a commitment of cess until the year 2030-31, and other assumptions:

- estimates based on 2004-05 data on tolls, loan and interest repayments,
- scheduled quarterly completion of highways in terms of length,
- toll incomes do not include under BOT (Toll) project
- toll considered at Rs.5 million per km in Phase-I, at Rs.1.8 million per km in Phase-II with 5% p.a. growth on a/c of traffic,
- Maintenance considered at Rs.1 million per km on annualized basis

Based on these estimates cess funds would soar, even compared to toll incomes, as can be observed in Figure 5.2. Although it can be seen in the graph that the private

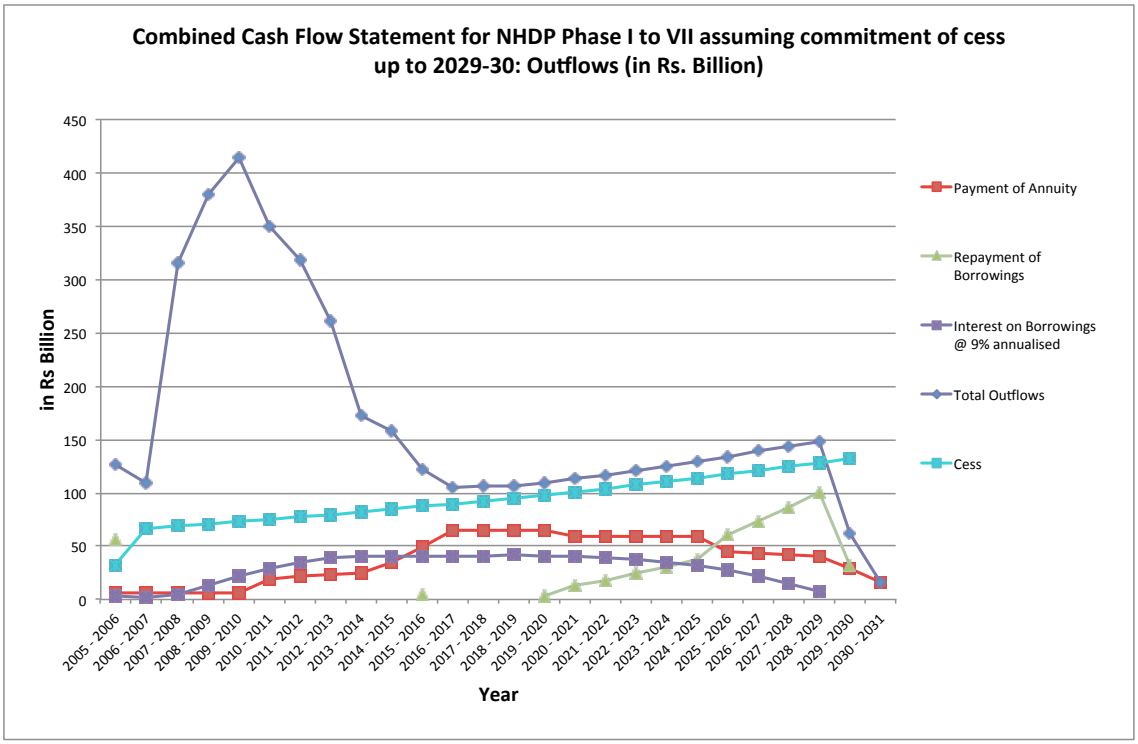
sector investments would contribute considerably at the initial stages of the project development, most of the expense of the NHAI would be funded using the cess. When this cess inflow is plot against the outflows of annuity repayments, repayment on borrowings and annualize interest, it can be seen that the cess funds would significantly contribute to these repayments. As the total outflows peak around 2010/11 that would mark the stage where public spending in the projects, although that would still be at the initial financing stage of many of the projects, Although these estimates do not assume an increasing a more efficient and developed user-charge regime in place by then, which is already showing signs of success. Other factors will also traffic growth higher than estimates, which would contribute to a higher net toll surplus.

Figure 5.2 Combined Cash Flow Statement for NHDP Phase I to VII Assuming Commitment of Cess up to 2029-30: Inflows



Source: Author's Calculations from COI Data for National Highways 2006

Figure 5.3 Combined Cash Flow Statement for NHDP Phase 1 to VII Assuming Commitment of Cess up to 2029-30: Outflows



Source: Author's Calculations from COI Data for National Highways 2006

The loans and borrowing from multilateral development banks and JBIC has been considerable towards the Phase 1 and 2 as can be seen in Table 5.4. JBIC projects are all complete as they were used to fund the initial NHDP projects, but World Bank and ADB funded projects are still underway. But the repayment of these projects will start around 2020 and peak around 2029, and interest rate payments will be a significant part of the repayment till then.

Table 5.4 World Bank, ADB, JBIC Funded Projects

Category	Awarded		Awarded Cost (Rs. Billion)	Completed	
	No. of Contracts	Length in Km		No. of Contracts	Length in Km
World Bank Funded Projects					
GQ	18	983	55.37	9	526
Others	0			0	
NHDP Phase I	18	983	55.37	9	526
NHDP Phase II	12	482	32.08	0	
Sub-Total (A)	30	1,465	87.45	9	526
ADB Funded Projects					
GQ	12	718	23.76	9	567
Others	1	48	0.58	1	48
NHDP Phase I	13	766	24.34	10	615
NHDP Phase II	31	1,636	75.65	2	157
Sub-Total (B)	44	2,402	99.99	12	615
JBIC Funded Projects					
GQ	5	111	3.33	5	111
Others	2	39	3.00	2	39
NHDP Phase I	7	150	6.33	7	150
NHDP Phase II	0			0	
Sub-Total (C)	7	150	6.33	7	150
Grand (A+B+C)	**81**	**4,017**	**193.77**	**28**	**1,448**

Status as on May 31, 2008
Source NHDP 2008 website

In terms of the trend in type of contracts used in NHAI, the trend in the late 1990s was the direct public financing of projects through EPC/CC, especially during the first two phases of the financing. There was a concerted effort to improve and focus on PSP, although the BOT Toll projects were not initially viable due to reasons mentioned earlier on in the paper, BOT annuity initially increased, eventually giving way to more PPP Toll projects. The public sector has also borrowed from the debt capital markets; it has largely borrowed mostly from the banks and financial institutions. As the equity market is still not ready and developed enough to accept the risks of these projects, and bond markets are not well developed, alternative long term financing options could aid public sectors financing options.

5.2 Pricing and National Highway Tolls

The rate of fee for the section of national highway, permanent bridge, bypass or tunnel constructed through public funded project or private investment project shall be identical. This however is guarantee's equity by allowing for no fee levied for two wheelers, tractors and animal drawn vehicles if there is alternative or service road. The rate of the fee for use of a section of NH of four or more lanes shall be, for the base year 2007-08, the product for the length of such section multiplied by the following rates:

Table 5.5 National Highway Pricing According to Type of Vehicle

Type of Vehicle (Gross vehicle weight, and number of passengers)	**Base Rate of Fee Per Km (in Rs.)**
Car, Jeep, Van or Light Motor Vehicle (LMV) (not exceeding 7,500kg and 12 passengers)	0.65
Light Commercial Vehicle (LCV), Light Goods Vehicle (LGV) or Mini Bus (7,500 – 12,000 kg and 12 - 32 passengers excluding driver)	1.05
Bus or Truck (12,000 – 20,000 kg and carries more than 32 passengers excluding driver)	2.20
Heavy Construction Machinery (HCM or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV – three to six axles) (20,000 to 60,000 kg)	3.45
Oversized Vehicles (seven or more axles) (over 60,000 kg)	4.20

Source: MoSRTH 2008

The rate of fee for use of a section of NH, having only two lanes but where there is an average investment for up gradation has exceeded Rupees one crore (ten million) per kilometer, shall be 60%. The rate of fee for use of permanent bridge, bypass, or tunnel constructed with the cost exceeding rupees hundred million shall be for the base 2007-08 as follows:

Table 5.6 Base Rate of Fee for National Highway Construction

Base Rate of Fee (Rs. per Vehicle / (Per) Trip)					
Cost of permanent bridge, bypass or tunnel (in Rs. million)	Car, jeep, van or LMV	LCV, LGV, Minibus	Truck or Bus	HCM, EME, MAV	Oversized Vehicle
100 – 150	5.00	7.50	15.00	22.00	30.00
For every additional Rs. 50 million or part thereof, exceeding 150 million up to Rs. 1 billion	1.00	1.50	3.00	4.50	6.00
For every additional Rs. 50 million or part thereof, exceeding Rs. 1 billion up to Rs. 2 billion	0.75	1.15	2.25	3.40	4.50
For every additional Rs. 50 million or part thereof, exceeding Rs 2 billion	0.50	0.75	1.50	2.25	3

Source: MoSRTH 2008

Provided that while computing fee for the section of national highway on which a permanent bridge, bypass or tunnel costing Rs 500 million or more is situated, the length of such permanent bridge, bypass or tunnel shall be excluded from the length of such section of national highway and fee shall be levied at the rates specified for such permanent bridge, bypass and tunnel:

Provided further that where the cost of such permanent bridge, bypass or tunnel, as the case may be, is less than Rs 500 million, and the said permanent bridge, bypass or tunnel, form part of the section of national highway, then instead of above rate of fee, the rate of fee specified under sub-rule (2) of rule 4 shall be applicable for the such permanent bridge, bypass or tunnel.

The explanation of the sub rule:

a) The cost for private investment project, shall be the cost as assessed by the executing authority prior to invitation of bids from the concessionaire;

b) The cost for public funded project shall be the cost as assessed by the executing authority six months prior to the completion thereof

1 Annual revision of rate of fee: the rates specified under rule 4 shall be increased without compounding by 3% each year with effect from the 1st day of April 2008 and such increased rate shall be deemed to be the base rate for the subsequent years.

2 the applicable base rates shall be revised annually with effect from April 1st each year to reflect the increase in wholesale price index between the week ending on January 6, 2007 (that is 208.7) and the week ending on or immediately after January of the year in which such revision is undertaken (Swaroop, 1994) but such revision shall be restricted to 40% of the increase in wholesale price index.

3 the formula for determining the applicable rate of fee shall be as follows:

Equation 1 The Formula for Calculating Toll Rate for Indian Highways

Applicable rate of fee = base rate + base rate * {WPI A – WPI B / WPI B} * 0.4

Explanation for the purpose of this sub-rule –
1 applicable rate of fee shall be the rate payable by the user;
2 base rate shall be the rate specified in rule 4 read with sub-rule (1) of rule 5;
3 WPI A means the wholesale price index of the week ending on or subsequent to 1st January immediately preceding the date of revision under these rules; and
4 WPI B means the wholesale price index of the week ending on 6th January, 2007.

4 and the annual revision of rate of fee under this rule shall be effective from the 1st of April every year.

Discounts:

Table 5.7 Pricing – Discounts for Using the National Highways

Amount Payable	Maximum number of one way journeys allowed	Period of validity
One and half times of the fee of one way journey	Two	Twenty four hours from the time of Payment
Two-third of amount of the fee payable for fifty single journeys	Fifty	One month from date of payment

Source: MoSRTH, 2008

5.3 Issues with the Current Model of Financing

With the government's policy of increasing PPP's in the National Highway sector since the mid 1990s, a cess fund that is growing incrementally every year, however, it is still not clear as to what kind of financing system the government is aiming at eventually creating. It is not certain as to whether the NHAI is supposed to pursue full cost recovery in the National Highway sector. Although reforming and unbundling the sector is creating efficiencies in increasing viability of projects, and regulating and fostering PSP, there are still uncertainties in fiscal and distributional considerations in assessing the desirable level of cost recovery. There is not clear-cut target in reducing borrowings in highway finance, and how to increase a cost recovery regime. Like other infrastructure sectors the fixed costs are high with large initial investments required in setting up the highway system. But once the system is in place output can be increased at declining average costs until the capacity limit becomes binding. Although apart from telecommunication full cost recovery is too difficult to achieve, a good management policy should be able to cover all of its operating expenses and debt service and to contribute substantially to its investment program out of its own resources (Swaroop, 1994, p. 1909).

Table 5.8 Contracts Under Different PPP Schemes

	No. of Contracts	Length (km)	Cost	
			Rs. Billion	US
BOT Toll				
Awarded	42	2,357	145.66	3.167
Completed	7	420	22.47	0.488
BOT DBFO				
Awarded	2	148	11.52	0.250
Completed	-	-	-	-
BOT Annuity				
Awarded	20	1,150	76.95	1.673
Completed	8	476	23.54	0.512

Source: NHAI 2006

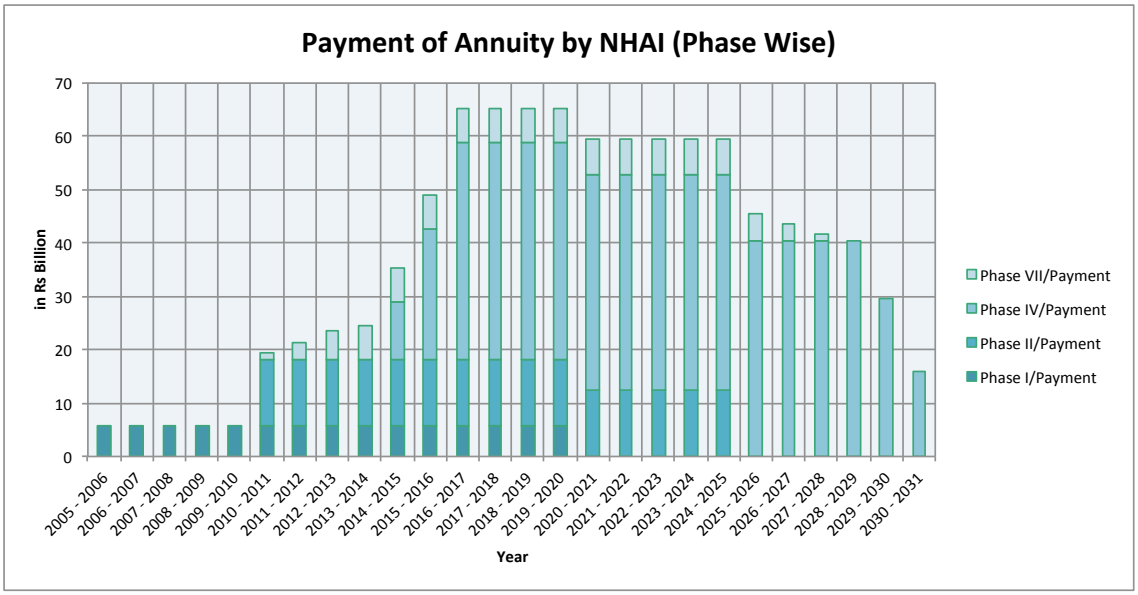
This raises the issue of tariff structure, and whether the NHAI is willing to raise tariffs to cover cost of investment and inflation as in India, the World Bank Study (2004) observes that the user charges current expenditures only because the highway network is being grossly under-maintained, poorly operated and with little attention to road safety. The study also notes that the user charges are economically inefficient (as it does not impose a higher congestion, on slow trucks), inequitable (as they charge buses more heavily), and promoting uneconomic distribution of traffic (as road freight is undercharged). User charges over time although needs to balance distributional equity, it also needs to include not only interest payments but also depreciation costs, as this would eventually generate a cash surplus over the sum required to meet the debt repayment installments.

Due to strict regulations the toll charges are being monitored by the NHAI, but there are many costs that are sill not being accounted for including: full road maintenance cost, system administration, environmental and other externality costs, congestion costs, capital investment costs, fuel tax, annual vehicle licenses, weight/distance charges, and road safety charges. Although the earmarking of funds for maintenance is crucial and is being carried out by the NHAI, the World Bank recommended that the three times the current level of expenditure was required for full maintenance of the network. Another crucial issue is that private provision would necessitate an appropriate rate of return, in other words a user charges that reflect cost would be essential.

The current trend in Toll collections current trends has been higher than estimated, in spite of complaints from the private sector that there has been default, due to corruption, lack of cooperation from state governments, and so on. With new stretches being of the National Highway being completed rapidly the NHAI has witnessed increase in toll collections the new toll plazas as well as from existing highways. For the 2008-09 fiscal the NHAI expects to exceed its toll revenue target of Rs 16 billion by another Rs 1 billion or more. During the last fiscal year 2007-08, with better results in toll collection, the NHAI had increased the target for 2008-09 to Rs16 billion from its estimate Rs14 billion. As for 2007-08 fiscal the revenue was already Rs14.15 billion. As per a data, only 6,212 km of the total national highway network of 66,000 km is currently tolled. (*The Mint* April 1, 2009, accessed online)

In spite of the many issues in financing the Highway development and its maintenance, the trend with higher toll collection has been a favorable development. If this trend continues, with more demand and data, could boos the governments endeavor to increase PSP through BOT toll. This would also mean that the NHAI BOT Annuity commitments especially from 2015 would need to be revised. As the COI estimate (2006) represented in the Figure 5.4 suggests that annuity repayment especially for phase IV, which is still being implemented, would constitute over half the payments. Using the Annuity mode of funding the projects is unjustifiable, unless the projects are unviable (that is unable to traffic risk or it is a political economy project). Issues such as these, demand the government to not only reconsider the risk sharing in projects, and not only assume risk on annuity projects, but reconsider opening up other financial instruments and alternatives for funding such long term projects.

Figure 5.4 Cash Flow Statement for BOT – Annuity (Phase wise – with Total Commitments)

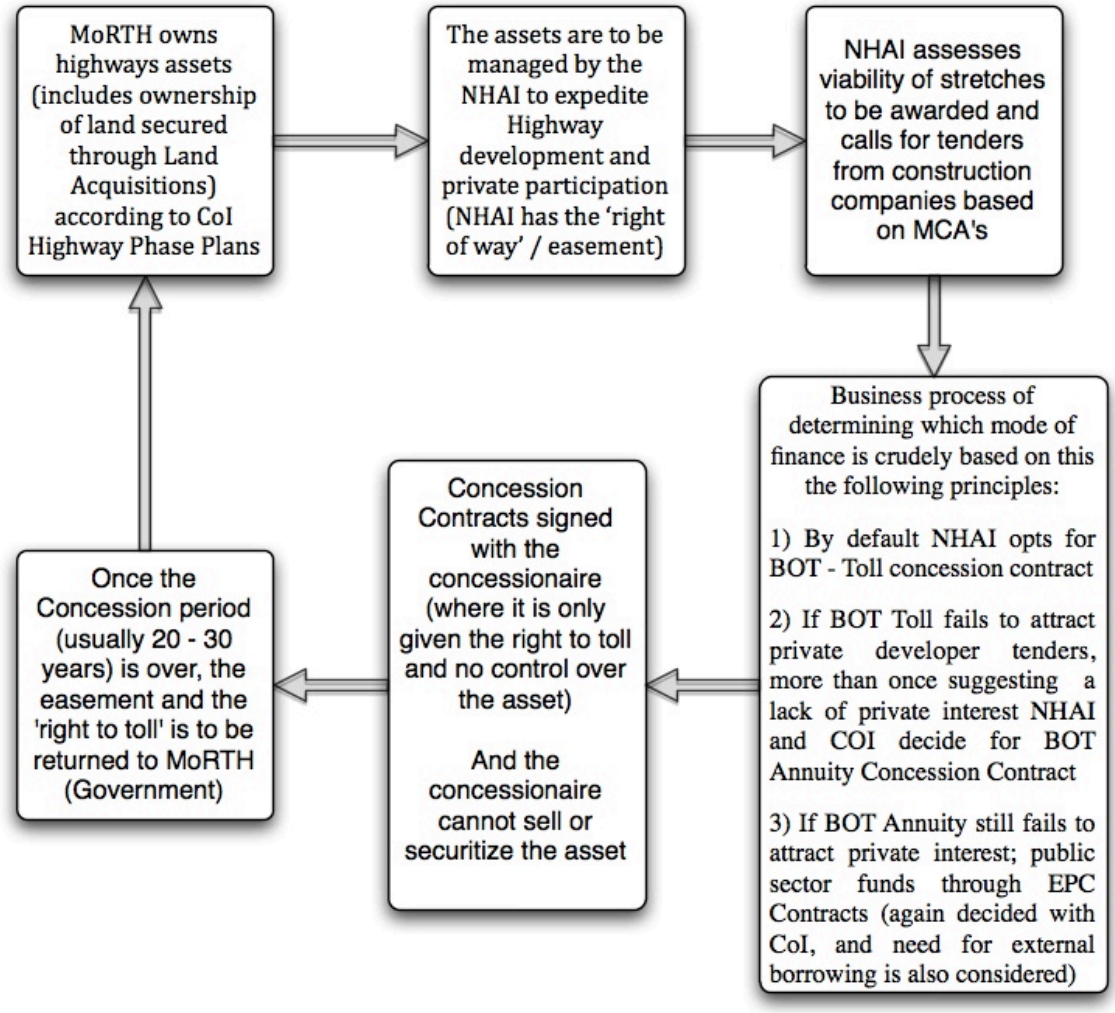


Source: Author's Calculations from COI Data for National Highways 2006

5.3.1 *Limited or Absence of Alternative Funding Methods (i.e. Bonds)*

Although it is impossible to account for all the developments in the financial sector in this paper, the crucial trends in the financial sector and macroeconomic developments that will have an influence on infrastructure spending in the national highways will be mentioned here. The financial sector is still dominated by the public sector banks while lending is also dominated towards the Public Sector Units or State Owned Enterprises. The bond market still not fully developed with no secondary bond markets, NHAI uses bonds minimally. Capital Markets are growing fast, with companies market capitalization growing quickly. Debt market is still largely used for financing government spending, which do cause imbalances in the financial system. Although there have are policy discussions towards looking at many infrastructure investment from a point that it requires long-term financing, and how this could be done for example, with domestic institutional investment (that is pension and insurance) fund reforms, securitizing toll or annuity receivables, and foreign exchange reserves (Haldea & Mohanty, 2003, p. 5). On the Fiscal side, the macro-economic condition has seen a large improvement with rising domestic savings rate and growing investment levels, and the government is actively trying to reduce its fiscal deficit with the FRBM. With regards to monetary policies have always been managed by the Reserve Bank, which is busy taming unsteady inflation rates, and aiming at full currency convertibility by 2011.

Figure 5.5 Organization of Highway Development and Ownership in India: Decision Making Process of NHAI in Bidding and Awarding Concession Contracts



Source: created by the author based on the interview with Senior Transport Engineer, South Asia Division, (September 2009) World Bank, New Delhi Office

As the Figure 5.5 outlines the decision-making flow chart in the NHAI determines on which mode to construct highways, as per conversations with World Bank Senior Transport engineer, the process is carried out in a very crude method that has often been very time consuming. It starts of with identifying a group of allotted projects that are jointly decided by COI and NHAI (by which time the government also makes its own assessment on traffic and liabilities). These allotted projects are then handed over to the NHAI by the Ministry of Roads, Transport and Highways (MoRTH), and MoRTH remains the owner of the assets and is responsible for land acquisitions (**Table 5.9** displays the clearances required and the Agencies responsible). The projects are put to test by issuing tenders for competitive bidding, and by default they opened to tender on a BOT –Toll mode. If however there are no bids, it is now entirely up to the NHAI and the COI, to re-assess the project and send it out for a rebid, this is only usually only up to a second time. As it is not such a scientific method, it raises issues as to the future of project development and role of the government in identifying and making stretches more marketable. So if the BOT – Toll does not garner enough

interest from developers (who are risk averse to commercial or traffic risks) the BOT – Annuity method is chosen, with a concession whereby the government pays the developer a fixed annuity each year for the concession period. The last option is the EPC contracts, where it is used only when the developers show no interest, or the government is interested owning the assets and can contract out separate tolling and Operation and management (O&M) Contracts.

But the real issue seems to about asset ownership, where concessionaire is not passed on the asset but only allowed to manage it, and in most case concessionaire's rely on bank based debt, and the issue is if the asset is passed on it will allow concessionaire's to securitize assets, to fund further investment. In fact even the NHAI is only the agent of the ministry that manage the highway assets and the 'right of way', under this circumstance the concessionaire only has the right to toll (and no control on the asset), and is also unable to securitize tolls. Even in worst cases the concessionaire business fails he cannot sell the asset or securitize the asset, making some projects (especially the ones with less commercial viability more risky. Another issue with the debt/equity ratios is the way firms artificially created, jack up project costs to get cover up for the equity part of their investment. So for example, if only 70% debt financing is allowed, and 30% equity, firms can escalate the cost to ensure they obtain debt financing for the entire project. National highways projects are constructed on debt finance (PPIAF), as without any differentiation of state or national highway, that too debt financing mostly from domestic public sector banks.[3]

Table 5.9 Major Clearances Required for Roads and Highways

CLEARANCES	CLEARING AUTHORITY
Cost Estimate	Ministry of Shipping, Road Transport & Highways/Public Works Department/ National Highway Authority of India
Techno economic clearances	Ministry of Shipping, Road Transport & Highways/Public Works Department/ National Highway Authority of India
Pollution clearance (water & air)	Central Pollution Control Board
Forest clearance	Ministry of Environment & Forests
Environmental clearance	Ministry of Environment & Forests
Company Registration	Registrar of Companies
Rehabilitation & Resettlement of Displaced families	Ministry of Shipping, Road Transport & Highways/State Govts.

Source: Investment Promotion and Infrastructure Development Cell, GOI

5.4 Development of National Highways Prior to the National Highway Authority of India-Era

Between 1984 to 2000 only developed about 1000 km of construction was taken up through 60 contracts of an average length of 17 km And these contracts were to take 8 – 12 years to complete and were characterized by cost overruns, poor contract management and institutional weakness. These projects were being carried out through to four multilateral loans, tow each from the World Bank and ADB

These could also be due to the organizational structure of how project were to be carried out:

- While the overall responsibility for highways was with the Central Government (Ministry of Surface Transport),
- The Public Works Departments (PWD) of the State Government on agency basis carried out actual execution of works.

[3] Based on interview with Senior World Bank Transport Engineer, New Delhi

The broad framework of implementation was:

- Detailed project reports: prepared by consultants but extensively examined and reviewed first by State PWD and thereafter Ministry of Shipping and Transport (MoST)
- Award of Contract: The PWD invited tenders and after their evaluation submitted the recommendations to the MoST.
- Once approved by the MoST contracts were awarded by the PWD.
- Both PWD and MoST followed the prescribed internal procedures of their respective governments that involved cross-referencing with other departments and ministries.
- All financial and technical decision had to get approvals through technical section, policy sections of the PWD and the finally the Finance Department of the State Government
- Supervision: prior to 1984 the supervision of the project was generally the responsibility of the State PWD, later it was supervised by the consultant and the PWD
- Variations and Financial Decisions during the Execution of the Project: These were examined by the PWD and sent to the MoST for approval and again followed the prescribed internal procedures of approvals.

The duality of responsibilities between the Central Government (MoST) and the State Government (PWD caused long delays at every stage of project implementation of contract awards, revision of cost estimates, approving design changes, decision on variations and on time extensions. (ADB 2007, World Bank 2004)

5.5 Private Sector Financing

As it is expected that all the sub-projects in NHDP Phase-III to Phase-VII will be ensued on PPP BOT mode, apart from the Phase II that had seen an increase in PPP. The government's efforts to increase and improve private sector participation and reduce the risks, financial, legal impediments to PSP are now more visible. Although during the early stages of NHDP, experts and policymakers in India have prescribed Annuity-based BOT model to finance highway projects so as to limit the effect of price elasticity of traffic demand, and also due to poor interest from the private sector. Annuity-based BOT model is still considered a traffic risk-neutral PPP model, where the granting authority will pay the concessionaire a fixed semi-annual annuity, regardless of the traffic using the facilities. This amount will compensate for the expenses incurred by the concessionaire in construction, operation and maintenance of the facilities, thereby the concessionaire does not bear the traffic revenue risk. But eventually the PSP saw a growth in BOT annuity from the earliest traditional EPC (Engineering, procurement, construction) or CC (Construction Contract) Civil Work contracts, but with new reforms BOT tolls is now gaining much more popularity, especially when traffic risks are less uncertain.

The general trend in India has been a rapid increase in private investment in infrastructure since 2003 (2008)Harris 2008). Its PPP program has grown rapidly over the last five to six years; between 2002–06 more than 150 PPP deals were closed, compared with 66 in the previous seven years. This growth has mainly been in the transport and urban infrastructure sectors, with road projects accounting for a large share of the increase, particularly in the number of projects. The Harris and Tadimalla study (2008) of 104 PPP projects (accounting 73% of the total PPP project value in India) and their financing between 1995-2007 was composed of: 68% senior debt, 25% equity, 3% subordinated debt (mostly transport projects), 4% government grants (viability gap funding provided during construction). Of the senior debt 70% was from commercial banks, four-fifths of this by public sector banks, 23% from institutional investors (5 % from the International Finance Corporation), and bond markets were used sparingly. On the Equity side 80% came directly from the project developers the next largest being the public sector.

In recent years the role of senior debt even with the private firms has grown while the share of equity has declined, leading to rising debt-equity ratios. One explanation for this trend is that commercial banks have become more comfortable with PPPs, particularly in the road sector, and are therefore willing to have senior debt make up a larger share of project financing.

The trends in PPP financing highlight several issues with implications for financing the large-scale PPP program envisaged by India's government. PPPs have relied heavily on commercial banks for their debt financing, and it is unclear how this dependence and relationship will emerge. Long-term financing exposes the banks to the risk of asset-liability mismatch, as the main source of funds for Indian banks is savings deposits and term deposits, with a maturity period ranging between less than six months to five years. Initially developers were comfortable with shorter reset periods, as this had been a period of declining or low rates. But as interest rates began to increase more recently, concerns arose about the impact on PPPs, because the concession contracts have no provisions for passing on higher interest charges. Continued increases in rates as well as a tightening of credit could have adverse effects on many projects. Interest rate volatility has been a serious cause for concern for the private sector as there is also a reduced liquidity. With the banks typically lend to infrastructure projects at close to the so-called prime lending rate or the benchmark-lending rate but these rates increased from 12.25-12.75% to 13.25-14% over the past five months alone (*The Mint, September 8th 2004*). With the increasing need for PPP's there is a growing need to broaden the sources of financing through policy reforms to capital markets and concession frameworks (Harris & Tadimalla, 2008, p. 1).

As also mentioned earlier, an active bond market can increase the flow of long-term funds and reduce reliance on banks, also for the private sector. The Indian corporate bond market, though one of the largest in Asia is still at an early stage of development, and its growth is hampered by institutional, legal, and regulatory constraints and this has made bonds a more expensive way of financing debt. These issues were raised, as well as recommendations were highlighted by the Patil Committee (2005), established by the government to look into improving terms for infrastructure finance. Following the suggestions of the committee, the government has set up reporting and trading platforms for corporate bonds. Many other important recommendations still await implementation. But implementing bond market reforms is a difficult challenge in the best of times, and in the light of the current global financial crisis the government would have to explore other innovative ways to ensure adequate flows of (private) financing to infrastructure PPPs.

On the equity side, participation by foreign players, particularly strategic investors, has been low even though PPP projects are now allowed to have 100% foreign direct investment. Foreign direct investment accounted for only 11 percent ($322 million) of the total investment in the Harris and Tadimalla study (2008). The port sector had the largest share with 51 % of this foreign investment, followed by airports with 32 % and roads with only 16 %. It was found that the reason why few pure equity providers were willing to invest directly in special-purpose vehicles was because many concession agreements put restrictions on the sale of developers' equity. More liberal norms is considered essential now to encouraging pure equity providers allowing them to participate at the time of bidding or to enter later with a majority stake.

Looking at it from an international perspective private activity in transport infrastructure in developing countries reaching peak levels in 2005-07, both in terms of new projects and investment commitments. With investment remaining concentrated in a few countries. The top five countries by number of projects (India, China, Nigeria, Mexico, and Indonesia) accounted for 67% of new projects implemented in 2005–07 while the five countries with the highest investment commitments (China, India,

Mexico, Turkey, and Hungary) accounted for 62% of transport investment in that period (http://www.ppiaf.org/content/view/440/216/).[4]

5.6 Public-Private Partnerships in Financing Infrastructure in India

Table 5.10 Total Number and Investment (US$ Million) in Projects by Type and Primary Sector

Private Participation in Infrastructure Database - Featured Indicators, 1990-2008

Sector	Concession		Divestiture		Greenfield project		Management and lease contract		Total	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Energy	1	22	12	3,688	100	42,159	0	0	113	45,868
Sub-sectors								Electricity	108	45,037
								Natural Gas	5	831
Telecom	0	0	2	4,399	32	48,499	0	0	34	52,898
Transport	111	16,886	0	0	66	7,881	2	0	179	24,766
Sub-sectors								Airports	6	4,514
								Railroads	4	760
								Roads	143	14,810
								Seaports	26	4,682
Water and sewerage	2	85	0	0	4	245	5	2	11	331
Sub-sectors								Treatment Plant	4	195
								Utility	7	136
Total	114	16,992	14	8,087	202	98,783	7	2	337	123,864

Sectors with some monopoly and oligopoly characteristics within Transport:

Airport: runways and terminals

Railways including fixed assets, freight, intercity passenger, and local passenger

Roads: toll roads, bridges, highways, and tunnels

Port: infrastructure, superstructures, terminals, and channels

Source: Calculations by Author from Private Participation in Infrastructure Database, World Bank, http://ppi.worldbank.org/exploreCountry.aspx?countryId=152 accessed February 2nd 2010

India has been very active in promoting PPP's as the previous section suggests. PPP's in number are especially high in the Transport, especially with Road sector (That includes the roads and Highways). In fact for the last 18 years, the Roads has had 143 PPP's with US$ 14 Billion, although the contracts are of small value each, they still commend a growing share in the number of PPP's. The Appendix also has a list of the details of all the projects under PPP, from the PPIAF. As the table below shows, the number of PPP's especially in the transport sector was growing annually in amount and number, except in 2008, reason being the Financial Crisis. As the list of projects suggest, most of the PPP's went to the National Highway section, and some to State Highways, as some project do not have a clear distinction, as to whether they were state highway or national highway projects, making it difficult to have an absolute number. But in general they were mostly in the National Highway Domain,

[4] Transport investment also includes investment in state highways, district/rural roads, but National Highways remains the highest in composition.

Greenfield projects, and BOT-Tolls concessions for over 20 years. To cater to investment needs of the road sector, the investments in the sector are projected to grow by around 24 percent over the next 5 years (KPMG, 2006, p. 21). The state and the central governments have planned investments in the road sector to the tune of almost USD 50 billion by 2011. The share of private participants is expected at USD 4 billion by way of equity alone for NHAI BOT projects under the National Highway Development Program from Phase III to Phase VII.

Table 5.11 Total Number and Investment (US$ Million) of Projects by Primary Sector

Private Participation in Infrastructure Database - Featured Indicators, 1990-2008

Sector	Energy		Telecom		Transport		Water and Sewage		Total	
Financial Closure Year	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
1990	0	0	0	0	1	2	0	0	1	2
1991	1	614	0	0	0	0	0	0	1	614
1992	2	13	0	0	0	0	0	0	2	13
1993	3	1,051	0	0	0	0	0	0	3	1,051
1994	1	311	4	97	1	125	0	0	6	533
1995	6	1,008	10	683	0	0	0	0	16	1,691
1996	6	1,553	6	1,229	4	182	0	0	16	2,964
1997	2	970	4	3,827	6	405	0	0	12	5,201
1998	7	1,066	2	673	8	296	0	0	17	2,035
1999	8	2,500	0	1,045	13	467	0	0	21	4,012
2000	8	1,954	0	682	1	30	1	0	10	2,665
2001	2	235	8	3,445	4	343	1	2	15	4,026
2002	4	386	0	4,615	8	715	0	0	12	5,717
2003	6	835	0	1,968	17	550	0	0	23	3,352
2004	9	4,144	0	3,731	6	1,117	1	111	16	9,103
2005	3	755	0	6,201	14	1,526	1	0	18	8,482
2006	16	5,465	0	7,271	52	9,629	0	0	68	22,365
2007	14	10,554	0	7,579	33	3,851	5	142	52	22,127
2008	15	12,454	0	9,853	11	5,529	2	76	28	27,912
Total	**113**	**45,868**	**34**	**52,898**	**179**	**24,766**	**11**	**331**	**337**	**123,864**

Projects cancelled or distressed: 5 （ 3% of total investment）

Source: http://ppi.worldbank.org/explore/ppi_exploreCountry.aspx?countryId=152

Accessed: Feb 2, 2010

The World Bank, has been deeply involved, especially in initially providing large loans especially during the construction of GQ, but now is involved in providing loans to two-laning National Highways other than the NHDP, and is recently involved in knowledge management through advisory and analytical support. Where the challenges is now slowly moving towards the technology in tolling (Microwave, infrared, GPS technologies being used), and there are already manual and automatic tolling stations (300), the World Bank is assisting the NHAI in bring all facilities under a single platform, to also make it on a real-time approach, where the data could be used in building a database and information systems could be used for studies and further development.

Table 5.12 Road and Highway Sector Specific Enablers and Considerations

Sector Specific Enablers	Sector Specific Considerations
• 100 percent FDI allowed • Capital Grant of 40percent of capital cost by NHAI to enhance project viability. NHAI also permitted to participate into equity of BOT projects •Institution of Central Road Fund for assured funding of road development projects. • Provision of encumbrance free site for work by Government • BOT guidelines for private sector participation put in place • Toll / shadow toll / annuity based concessions to private participants • New model concession agreement (MCA) finalized. The new agreement includes design, build, finance, operate and transport activities instead of build, operate and transfer. This implies that government, instead of owning the asset after the concession period, would continue to buy 'road services' from the concessionaire • Partial traffic risk mitigation introduced • Concession period linked to 6-laning of projects • Toll rates indexed to 40 percent of WPI • Sector has been declared an industry to allow commercial borrowing	**Policy / Institutional / Regulatory Issues** • Project for road development and maintenance failed to evoke interest from large reputed foreign and international firms (as size is small lesser than 100 km) • No uniform tolling policy • Disparity in tolling rates between private-funded projects and public-funded projects leading to user resistance **Project-level issues** • Acquisition of land is an impediment that delays project implementation • Traffic figures of government are on the higher side, leading to independent traffic projections by entrepreneur and project lender(s) causing delay in financial closure

Source: KMPG 2006

The new Minister for MoRTH Mr Kamal Nath has been very proactive in looking at the future scope and the fast tracking of National Highway Development. In fact he went on a world tour to the US, Middle East, Singapore, Hong Kong, and more recently even to Tokyo, to assess the appetite for foreign institutional investors to invest in a possible expansion of Highway Bonds. There are also Mega PPP's apart from the 7 phases being proposed (each at $2 Billion – being amenable to BOT - toll) being proposed, and made on a large consortium's to be build highways along the mineral belt between Mumbai to Kolkata and Gujarat to Punjab. Interesting facts were that the BOT Annuity was the IDFC's Idea so as to deferring responsibility, but this requires long term planning, assessing contingent liabilities. In fact the World Bank is already doing its own transport research Study in the region (South Asia) to capture 27/7 real time data (although India is the real focus with 15 states being selected/out of 18 primary group of states). These studies provide the raw data for the government and also provide policy direction to the government. As the role of data is becoming important there is also data that is being collected to the specific type of vehicles and time data. Where even Operation and Maintenance contacts now require data, so as to use road information data up gradation and maintenance needs. The data is also being used extensively for road safety/accident data, which the O&M operators collect as part of the contract (and NHAI can monitor) making the data more reliable.

There are great opportunities in the securitization of future Toll receipts. As this was already assessed in Chapter 3 on financial intermediation, and has been practiced extensively in China at the provincial level, although it is doubted that this model could be used widely elsewhere. But the government there builds a toll road

(usually several of them) and, after the road is complete and most construction and traffic risks have disappeared, it sets up the road(s) as a public limited company. The company is then listed on the stock exchange and the government sells shares in the toll road corporation. The share holders earn dividends on their shares – with profitability depending primarily on the growth of traffic, inflation and approved toll increases – and the provincial government invests the money paid by share holders into constructing new toll roads (Brixi & Irwin, 2004, p. 9).

Table 5.13 Important Developments in the National Highway Sector Over the Recent Months

• By the end of last year the MoRTH is ambitiously planning on developing 35,000 km of national highways in the next five years. • The B.K. Chaturvedi Committee on National Highways Development Project has failed to address the crucial issue of granting autonomy to National Highways Authority of India in its report. In order to minimize interference from influence from the Ministry • For road developers, the bidding process for highway projects has been simplified. A developer is now no longer required to go through the RfQ process for each and every project. Once accepted as being qualified for the bidding process of a particular project, the developer can bid for other projects as well without having to go through the RfQ process again, provided it is within a span of one year. • The technical threshold capacity criteria for bidding have also been relaxed. The threshold level is now equivalent to the project cost. Similarly, significant changes have been carried out in disbursement of Viability Gap Funding, the exit clause, the termination of contract clause, and the interest of conflict clause, to make highway development projects more attractive to highway developers. • According to the Chaturvedi Committee report, the NHAI would need approximately Rs 1.90 Trillion as borrowings till 2030-31. • The ministry is scouting investment of $70 billion for road construction in the next 3-4 years, out of which about $45 billion is expected to come from the private sector, including $10 billion from foreign investors (Business Line: Delhi July 17, 2009) • India has sought $2.96 billion loan from World Bank for two-laning of over 17,000 for development of non-NHDP National Highway sections in various states to two-lane standards • Despite some concerns over implementation of the National Highway projects, the World Bank has also agreed to look at funding of viability gap, he said. • There are 163 arbitration cases relating to Rs85.09 billion worth of highway projects under NHDP.
• The land acquisition remains the single largest impediment in building of roads and pointed out that out of 218 projects completed under NHDP, 146 projects were completed behind schedule. • State governments have been requested to set up dedicated 192 Special Land Acquisition Units to speed up land acquisition exclusively for NHDP projects, he said, adding chief secretaries have been requested to head the monitoring committee in their states to accelerate land acquisition. • The minister has set an ambitious target of building 7,000 km of highways annually, or 20 km a day, requiring an investment of about Rs 1 trillion • The road show in Singapore, jointly organized by ICICI Bank and JM Financial Institutional Securities Private Ltd, completes the Asia tranche of the events. A similar road show was organized in Mumbai last week. The sector's investment requirements till 2012 are pegged at $12 billion. This is the first time that the ministry has planned to organize such road shows. • B K Chaturvedi committee, set up by the prime minister to work on measures to fast track award and financing of highway projects. The committee, in its first

report, has also pitched for delegation of more power to the road, transport and highways ministry on issues related to the MCA, RFQ and RFP (request for quotation, request for proposal). (Economic Times 2009, 0656 hrs IST)

- Senior officials said considering the need to pump more funds to take up the highway development projects, the committee has recommended for sovereign guarantee. In this case, government guarantees that an obligation will be satisfied if the primary obligator defaults. This means, in case the NHAI fails to pay up, Centre will compensate for that.
- To build 1,000 km of expressways at an estimated cost of Rs 166.80 Billion proposed by the Union Road Transport and Highways Minister Kamal Nath today said the government was considering setting up an authority for expressways on the pattern of the NHAI in order to give impetus to infrastructure development in the country. (economictimes.com July 15, 2009)
- The government plans to build 1,000 km of expressways at an estimated cost of Rs 166 billion, which is likely to be completed by December 2015.
- "The government is considering an expressway authority. The new authority will identify routes, technology and schemes for the expressways," Nath said at the National Highways Development Conclave organised here by the Confederation of Indian Industry (CII).
- There are plans and on making toll collection a tangible asset, so that banks can offer loan to concessionaires.
- Also, the trend of lower realizations per km is likely to continue due to another reason. NHAI is bidding out the dense stretches to private developers on a BOT basis, wherein the toll revenues will accrue to the developer during the concession period. In absolute terms, however, the NHAI's annual toll revenues have gone up to Rs 17.03.13 billion in 2008-09 against Rs 14.15 billion in 2007-08. There are other factors also that stop NHAI from collecting tolls on several sections.
- The authority had 11,037.2 km of completed stretch as on March 31, out of which 3,417.34 km were "partially completed" and "not fully completed that make it eligible for tolling". This 3,417 km comprise a mix of public and private funded
- Even out of the remaining tollable stretches of 7619.86 km, NHAI could not toll about 1,168 km in 2008-09 due to various factors. After full physical completion of a project, some paperwork is required to start tolling – like issuance of a public notice, gazette notification and approved commercial operations date (for BoT). "This also leads to a time lag," said an official, adding that about 364 km were added for tolling in April 2009.
- The objective is to build specialized tolling companies like those in Europe and the US, which bring in the best technology and practices. The business of tolling companies overseas translated traffic to value. Besides, the governments concerned got the best returns in the process.
- RFC proposal: There are plans to establish Road Finance Corporation

Source: Compiled by the Author, from relevant websites and livemint.com, financialexpress.com, economictimes.com

5.7 Conclusion

The first two phases of National Highway Financing saw the introduction of BOT (Toll and Annuities) PPP's in financing the National Highways, although more than two thirds of the funding came through the recently established Central Road Fund (from fuel tax on petrol and diesel - cess) and borrowings from Multilateral Financial Institutions, and less than 10% from private finance. Looking at the government's plan in financing the NHDP over the 30 years till 2030-31 suggests that while outflows will peak 2009-10, inflows were expected to peak in 2008-2009 (according to the plan in 2006), and annuity repayment is expected to be highest between 2015-16 and 2027-2028 (above Rs 40 Billion annually); but the situation is changing fast. Even with the government's conservative estimates, the Central Road Fund (fuel tax - cess) is expected to soar over the next 20 years, while toll revenues are too modest (as they are already exceeding estimates), and even though the government is committed to constructing more stretches on BOT – Toll, this has not been converted into policy by providing the private sector with adequate incentives (to promote competitive bidding and raising services levels). More quality studies would be required to understand traffic demand, to ensure that there is no over-investment in creating assets (requires more vehicle ownership studies, travel trip analysis through Origin-Destination surveys, and so on). With PSP in general on the increase (in spite of many projects receiving no bids under BOT tolls), the number of concession contracts in highways is already the highest in India, with 143 contracts at a value of US$ 14 Billion for Highways and Roads over the last 18 years (as of February 2010- breakup between highway and road not available). With a general equation for pricing tolls, on a fixed rate based on wholesale price index (WPI) the highway network is expected to be cross subsidized (temporal and spatial). Several issues however remain at large: 1) double taxing of beneficiaries (tolls and fuel tax), 2) decrease in CRF over time, 3) more periodic reviews in toll rates, 4) the danger of regulator (NHAI) capture by agents that are being regulated (private developers, construction worker labor unions), 5) future concerns in network development using pool that will lead to debt (as with the case of Japan), 6) the evolving framework in manage highway assets and profitability (that is horizontal unbundling), 7) and to slowly move towards an highway expansion plan based on cost-recovery on a more accurate user-charge system.

6 The Japanese Experience with Highway Development and Its Financing

6.1 Introduction

Japan now has one of the worlds' most highly developed multimodal transport system, which would not have been possible if it had not been successful in building an extensive highway network in such quite a short duration. The two remarkable aspects about this network is that the scale and layout of the network were determined not only in accordance with the forecast of traffic volume, but also in accordance with equal opportunity. The other is that the public corporation responsible for the highway network development relied extensively on a debt financing strategy, relying on toll revenue collection, with the aim of accelerating the nation's highway development within limited funding capacity of the national government. With a motive of equal access, to enable as many people as possible to enjoy the service of high-speed transport, a pool system of revenues and costs (plus a uniform toll rate system) was adopted for all intercity expressway routes. The costs of each route were to be covered by tolls paid by its users, cross-subsidization from other routes, and public funds. But over the years the costs that came with building such a system was high, and this has created large level of debt obligations in the highway public corporations. Japan in other words is on the other side of the spectrum of its highway development program, where it is now undergoing rapid transition and possible privatization of its highways.

6.2 Early History of the Japanese Highway Sector

Japan in spite of its image as a country with well managed compartmentalized transport infrastructure services, did not have a road system adequate for auto traffic even until the end of World War II. At the 1952 Census, less than 6% of national highways and prefectural roads in Japan were paved, and bicycles accounted for 87% of the vehicles registered, other slow vehicles (horse and ox-carts and handcarts) accounted for 7% , and mechanically propelled vehicles for only 6% (Black & Rimmer, 1982, p. 3) Only after the war was there a rapid transformation, and road construction was taken seriously and developed on a large scale. But by the 1970s, an extensive expressway system was under construction and urban traffic flow was orderly, with shiny white paint marking vehicle lanes, turn pockets, medians and pedestrian crossings, and computers controlling signals at intersections. This has placed Japanese transport engineering and planning into global standards. But the credit goes to the state that facilitates corporate accumulation, promotes the destructuring and restructuring of economic activities and copes with its disruptive consequences.

According to the study by Black and Rimmer (1982) there were three early phases of highway development in Japan during the post-war period. During the first phase, it was subordinated to the political and economic influence of the United States after the Pacific War, Japan's highway planning practice reflected heavy borrowing of American ideas and techniques. Resistance to the renewal of the Security Pact in 1960 marked a more independent Japanese state looking inward at rapid economic development, during which time transport engineering and planning were being revived to meet local conditions before being widely applied within the country. The third phase during the 1970s where Japan started incorporating transport planning

and engineering feasibility studies as an integral part of aid especially to Southeast Asia, its major recipient (p. 30)

As part of Japan's reconstruction, a memorandum from the Supreme Commander for the Allied Powers (SCAP) in 1948 outlined the initial five-year road plan (which replaced the German autobahn-style highway planning in vogue during the early 1940s). This was to be administered and implemented by the Road Bureau, Ministry of Construction. However, when Japan's post-war recovery faltered in 1949, and with the fears of communist penetration in Southeast Asia with the dawn of the Cold War, led to a change in American foreign policy. Under the United Nations' Korean War effort in 1950, the Japanese economy recovered, especially in the transport sector with strategic road building and the establishment of the Police Reserve Force (later Self-Defense Force) also stimulated demand for Japanese-made motor vehicles. After the Korean Wars the United States, sought to foster Japan's economic reconstruction and stabilization by facilitating export-oriented industrial growth, including the upgrading of highways to support the domestic motor-vehicle industry.

In 1952 Law Concerning Special Measures for Highway Construction (SMHC Law) was enacted, which provided loan funds from a Trust Fund Bureau of the Ministry of Finance to construct roads and approved the collection of tolls from users to repay the loan. This also gave rise to a new road administration with the Road Law (as amended in 1952) and later to the enactment of "Law for Temporary Measures Concerning the Source of Funds for the Improvement of Roads 1953", which prescribed that the government establish a five-year road improvement program to start the following year. Public roads in Japan were then classified into primary national highways, secondary national highways, prefectural roads and municipal roads. Out of 140,657 kilometers of national highways and prefectural roads, only 15% had two or more lanes and only 5.4% were paved; 47% of all the bridges were wooden. In 1953 a petrol tax was also introduced (revenues that came out of 54% of the retail price) and allocated to accelerate the road construction program. During the first Five-Year Plan had strong American influence and specialists led by Dr. Ralph J. Watkins visited Japan under government sponsorship in 1956, to consider the economic feasibility of an expressway linking Nagoya with Kobe.

When Watkins wrote in the report in 1956, of the sorry state of roads in Japan, to quote: “No other industrial nation has so completely neglected its highway system” (Kimura & Maeda, 2005, p. 4). This further triggered a flurry of additional highway legislation providing for national expressways, national toll roads, revised funding arrangements (government bonds, grants to prefectures) and metropolitan expressways. As at that time, even among first-class national roads, only about a quarter of them were paved, even the Tokyo with Osaka route on the National Highway Route 1, two third of it was paved. The report also stressed the importance of roads as social overhead capital that it was imperative for economic growth. Apart from that it also introduced the concept of transport demand analysis and methods for estimating traffic diversion from existing roads to new roads. Simultaneously, economic evaluation methods and road investment criteria were borrowed from the International Bank for Reconstruction and Development.

These developments, gave American engineers the chance to influence highway design and construction in Japan, and this was furthered when the International Bank for Reconstruction and Development started funding highway projects. Although the Japanese borrowed modern methods of highway construction and geometric design from the US, they had to make considerable changes as settlement patterns in Japan were denser and poor roads in Japan necessitated a check to highway capacity. This even led to the development of a *Highway Capacity Manual* that was used as the basis for expressway design although "capacity" was "revised" from 2,000 to 2,500 vehicles

per hour per lane. Geometric standards were scaled down due to high land-acquisition costs, and some innovations, such as trumpet interchanges to facilitate toll collection, were introduced (Black & Rimmer, 1982, p. 6).

In the mean time in April 1956, the Japan Highway Public Corporation Law was enforced giving rise to the establishment of Japan Highway Public Corporation (*Nihon Doro Kodan* or JHPC). At the same time, the revised SMHC Law was enforced, and the JHPC took over the role of the Government (Ministry of Construction) to construct national toll highways and collect tolls. Earmarked funds for road improvement were also introduced in 1954 and were expanded as a major fund raising channel for road construction and maintenance at both national and regional levels. However, a relatively small portion of the funds has been used for highway construction. Planning then began on the Meishin and the Tomei Expressways that linked Tokyo and Kobe in October 1957, and these were based on surveys and designs made by the JHPC to oversee construction of expressways and toll roads. The IBRD, lent to many other JHPC projects since the 1960s (refer to Table 6.1), and all repayments were completed by 1990.

Table 6.1 World Bank Loans to Japan Highway Public Corporation and Expressways

Year	Date Signed	Beneficiary	Project
1960	17-Mar	Japan Highway Public Corporation	Amagasaki Ritto section of the Meishin Expressway
1961	29-Nov	Japan Highway Public Corporation (2nd loan)	Ichinomiya Ritto and Amagasaki Nishinomiya sections of the Meishin Expressway
1963	27-Sep	Japan Highway Public Corporation (3rd loan)	Tokyo Shizuoka section of the Tomei Expressway
1964	22-Apr	Japan Highway Public Corporation (4th loan)	Toyokawa Komaki section of the Tomei Expressway
1964	23-Dec	Metropolitan Expressway Public Corporation	Haneda Yokohama section of the Metropolitan Expressway
1965	26-May	Japan Highway Public Corporation (5thloan)	Shizuoka Toyokawa section of the Tomei Expressway
1965	10-Sep	Hanshin Expressway Public Corporation	Kobe line No. 1
1966	29-Jul	Japan Highway Public Corporation (6th loan)	Tokyo Shizuoka section of the Tomei Expressway

Source: URL for this page: http://go.worldbank.org/9J0TYP38K0 (accessed 1st September, 09)

As the framework and major legislations were all set in place during the 1950s the 1960s saw a shift in Japan's economic policy whereby there was a pronounced shift from a dependence on steel, chemicals and shipbuilding to lighter industries, such as motor vehicles and electronics. The number of motor vehicles was 130,000 at the end of WWII, this figure reached 500,000 by 1951, one million in 1953, and two million by 1957. The Japanese government, faced with severe budgetary difficulties, had to address explosively increasing demand for road traffic after WWII. The Security Treaty in 1960 with the United States also gave an opportunity to gain political equality with the West. This necessitated a change in emphasis from national expressway planning to urban road planning, as indicated by Table 6.2.

Table 6-2: Japan's Five-Year Road Programs 1954 – 1978 (¥Billion

Designation	Date	Period	Investment					Special features
			Ordinary	Toll	Prefectural	Contingency	Total	
First	May 1954	1954–58	260	–	–	–	260	Funding from petrol tax revenues
Second	February 1959	1958–65	610	200	190	–	1,000	Inauguration of construction of expressways
Third	October 1961	1961–65	1,300	450	350	–	2,100	Improvement of relevant road network for Tokyo Olympic games
Fourth	January 1965	1964–68	2,200	1,100	800	–	4,100	Improvement of metropolitan area road networks
Fifth	March 1968	1967–71	3,550	1,800	1,100	150	6,600	Further development of express-way systems
Sixth	March 1971	1969–74	5,200	2,500	2,550	100	10,350	Expressways, local arterials and by-passes, winter maintenance and safety coordination with freight movements
Seventh	June 1973	1973–77	9,340	4,960	4,700	500	19,500	Urban traffic improvements; pollution control (noise and air), landscaping
Eighth	May 1978	1978–83	13,500	6,800	7,500	700	28,500	Promotion of environmental measures along highways, traffic safety and anti-earthquake programmes

Source: Nihon Doro Kodan, 1978.

6.3 Development of the Japanese Highway Network

National highway planning in Japan was then founded on clear objectives, with straightforward economic considerations and some simple analyses. Where the priorities was the construction of an expressway network that would develop land, industry habitation space in a well-balanced way, eventually leading to an increase in productivity and an anticipated increase in automobile traffic demand. These basic principles indicated that a network of over 10,000 km to connect the central cities of each local region, new industrial areas and "Special Areas for Coordinated Industrial Development", and to ensure that all people would be within two hours of the system. But the final selection was to be based on traffic demand calculations. The country was partitioned into "zones" around 110 major cities; the future number of vehicles in each "zone" was estimated, and forecasts of inter-city traffic were calculated from an unconstrained gravity model (vehicles were substituted for the population "mass" in the numerator, and projected expressway driving time for the "friction factor" in the denominator). Results suggested an optimal network of from 5,000 to 6,000 km, but re-adjustments were made to accommodate areas with heavy traffic and Hokkaido – an island with a large area but a small population.

The National Arterial Expressway Construction Law passed in 1967 provided for thirty-two routes covering 7,600 km (refer to Figure 6-1). Within the guidelines of this long-term plan, individual road projects were selected both in accordance with road construction policies (priority was to be given to districts with heavy traffic demands) and with regional development plans. The initial expressways were already built during the 1960s: the Meishin Expressway was opened to traffic in July 1963; the Tomei Expressway in 1969. Cost efficiency estimates by the Japan Highway Public Corporation show that the Meishin Expressway recovered 31% of its construction costs in the first year of operation, compared with 38% for the Tomei Expressway in an equivalent period ((Black & Rimmer, 1982, p. 6). Expressways were recognized as the key to addressing urban traffic problems. Even in Tokyo, a plan for eight radial routes and two ring roads, totaling 71 km, was formulated in 1958 with the intention of completing construction in time for the Tokyo Olympic Games in 1964 (p. 6).

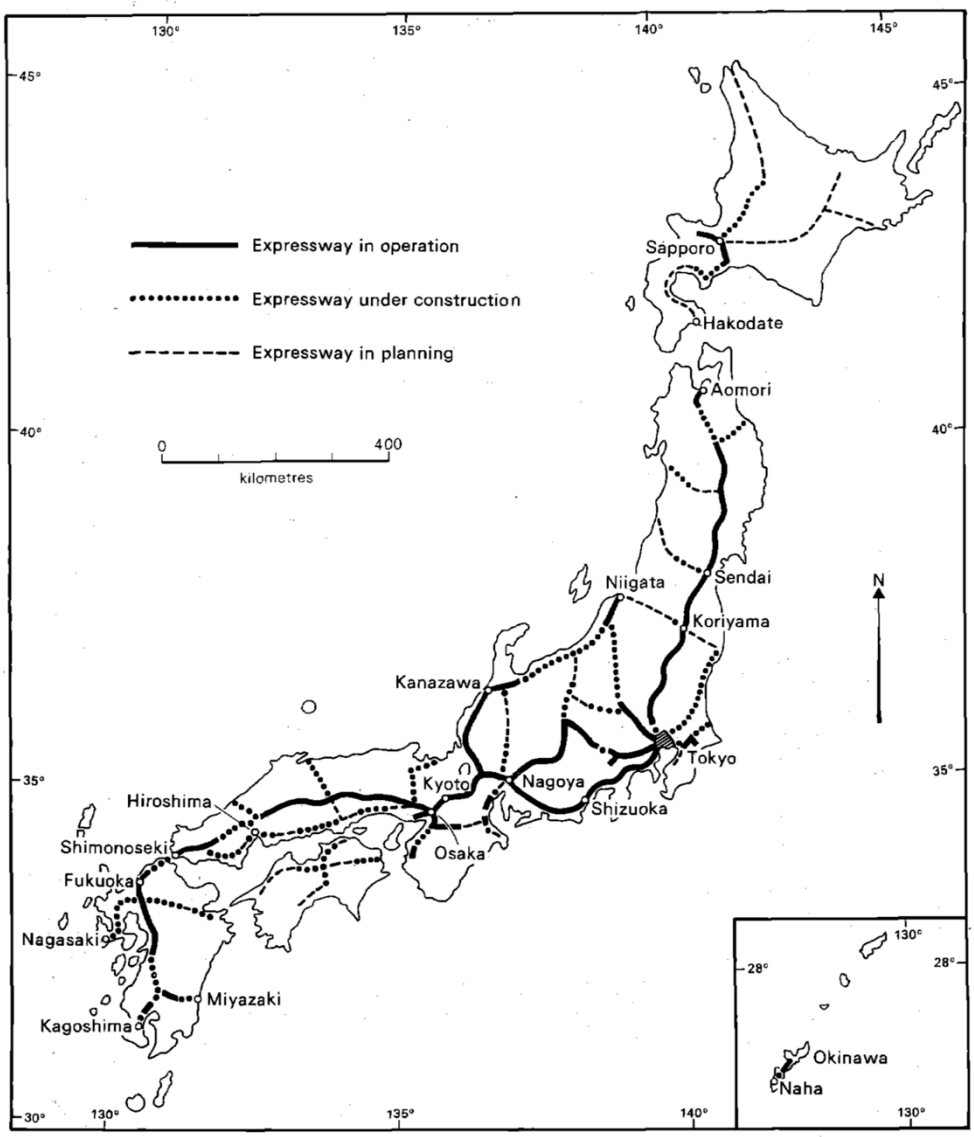


Fig. 1. Network of National Expressways 1978 (source: Nihon Doro Kodan [Japan Highway Public Corporation], 1978; insert map).

Figure 6.1 Network of National Expressways - 1978

Apart from all these developments the government's desire to reduce transport costs for the private sector and to accommodate traffic demands was consistent with aims for national road planning. By transferring a rural design philosophy of expressways to the cities, urban road planning failed to recognize the vital interrelationship between land use, traffic and transport, and the need to plan for all transport modes. To overcome such criticisms, the Japanese were anxious to assimilate the methodology of urban land use and transport planning, especially with motor vehicles rising from the million mark in the early 1950s to 28,229,000 in 1975. Later, data from Fukuoka and Kobe was used for some exploratory work on travel demand analysis. However, it was not until 1967, the year in which the production of passenger units out-stripped light commercial vehicles for the first time. That gave sufficient confidence to conduct the first comprehensive land use and transport study.

The initial large-scale person trip survey was undertaken in Hiroshima (750,000), and employed four-step aggregate models to forecast traffic and plan rail and road facilities. Another study, using different permutations of sub-models, was conducted in Tokyo (population 21,310,000) during 1968, with a study area covering a 50-km radius from the city centre. Both approaches were repeated and contrasted in Osaka during 1970. As for the methodology there was no doubt that it was a product of 1960s Western thinking, but as observed by Black and Rimmer (1982) there were four innovations:

(i) First, a separate traffic generation model for the whole of the study area acts as a control against which zonal traffic production and attraction estimates are checked.

(ii) Second, there is an explicit way of handling *intra-zonal* trip distribution and modal-split.

(iii) Third, modal split is treated consistently as a binary choice problem with options for the two "modes" as either public versus private transport or road-based transport versus fixed-track (usually rail) transport. (There is also a cycle-walk binary choice option.) - - -

(iv) Fourth, urban goods movements were also included, as demonstrated by commodity flow studies in Tokyo (1973), Kyoto-Osaka-Kobe or Keihanshin (1975), Chukyo (Nagoya and surrounding areas) (1976) and Sendai (1977) - distribution terminals becoming a distinctive feature of the economic landscape after the "Distribution Facilities Establishment Act, 1966"

And by 1977, twenty-three urban transport studies had been completed in Japan, providing the basis for master plans of urban roads, monorails and new traffic circulation systems. The value of such planning methodology was the ability to make inferences about national road planning, where it was becoming more important to accommodate the amount of extra traffic without introducing undue journey delays. Increasingly, it has been recognized that government intervention is necessary to control the direction of urban expansion and to manage (and perhaps restrain) the demand for travel.

Where it becomes important to evaluate a policy economically from its, resource allocative efficiency and fair distribution of wealth and income, in looking at transport infrastructure network improvement, the equity and equality balance is exceedingly important. In determining the target scale and layout of the expressway network of 7,600 km, one important factor was traffic demand and the connection of major cities and regional capitals. Another determinant was the coverage rate of area and population by expressways, so as to enable people in every region of the country (except for remote mountainous areas and isolated islands) to reach the expressway network within two hours. This assumes that the latter concept took no account of the level of traffic demand directly and the policy objective was to give as many people as possible the opportunity to enjoy the convenience of expressways.

However, the actual plan of the expressway network covered not only built-up areas having a high agglomeration and areas with a potential to grow highly agglomerated regions, but also included areas with a poor potential for growth as well. Therefore, it can be said that the expressway plan is also based on the objective to attain equity or equality in the availability of high- speed transport services. In actual policy choices, the problem of to whom the costs and benefits belong remains crucial in that society may be unwilling to accept policies selected only from the viewpoint of efficiency. The concept of equity or equality is not always in agreement with fairness in distribution, either. While there are high expectations of expressways in promoting the regional development and in improving the income level of inhabitants in the regions where they are constructed, low-income levels are not the major reason for these regions being included in the network plan. The designs of transport infrastructure

networks in Japan, including the railways, expressways, and airports are know to have relied more on the concept of equal opportunity than on fair distribution.

But until 1972, when only one trunk expressway between Tokyo and Osaka and a few other sections were in service, separate accounts for each routes were kept. Thus, each route kept its own accounts, and was expected to pay for itself, and tolls were collected and applied on a route-by-route basis. However, with the plans to rapidly extend the network subsequent years, the Consultative Council on Roads for the Minister of Construction in 1972 proposed the creation of the pool system to manage the network uniformly. The toll pooling system accompanied with internal subsidies across projects was justified as follows (Kimura & Maeda, 2005, p. 6):

(i) The expressways are integrated into the nationwide network, and the traffic services of the same quality should be offered to the users of all roads.
(ii) Since all the routes are not constructed under the same conditions, it was important to address the impact of cost fluctuations of construction due to difference in construction periods.
(iii) If the profitability were assessed separately for each route, it would be difficult to construct and accelerate the fund raising required for the entire highway network development.
(iv) With the toll pooling system, the level of toll and the toll collection period would be consistent.

The Council also recommended the adoption of a uniform toll rate system over all routes. The government accepted these proposals. It abandoned the individual redemption basis of the past and instead introduced the pooling redemption formula. Under this plan, the costs of the whole network (including interest accrued over a 30-year redemption period) was be paid by the toll revenues generated from the entire network. In other countries, there are some cases where a regional pool system has been introduced for expressways, but a nationwide pool system, like the one in Japan, was exceptional at that time.

During the 1970s while Japan's internal transport policy was deeply being transformed there was also international policy evolving, based on external economic assistance by providing transport technology cooperation and technology transfers. This was also to reconcile its growing image of penetration and dominating selected Third World countries especially in East Asia to secure its "food bases" and "natural resources". Misunderstandings about the nature and scope of Japanese aid in the form of reparations, quasi-reparations and financial grants - largely in the form of bilateral (yen credit) loans were only culminating in joint ventures and branch factories – eventually became the root cause of anti-Japanese feelings by the mid 1970s. To counter its declining image, Japan not only boosted its aid further to the Third World but began to concentrated more on technological transfers (initially with agriculture and industrial development to later energy and human resource) and technological cooperation. In pursuing this changed policy emphasis, the Japanese Government organized its aid agencies (Overseas Technical Cooperation Agency – OTCA and later the Japan International Cooperation Agency - JICA) to draw on specialist staff from government organizations (for example Ministries of Construction and Transport) and co-opted university professors on to its supervising committees. Table 6.2 enlists a sample of transport projects (excluding ports and airports) in East Asia which received ￥572 billion between the financial years 1974 and 1977.

Table 6.2 Japanese Loan Agreements for Road and Rail Transport in East Asia

Country	Project description	Amount (100,000,000 yen)	Agreement date
Indonesia	Jakarta–Merak road reconstruction consultancy	2.4	August 1975
	Rembang–Merak road construction	125.0	Jun. 1973/Sep. 1974/ December 1976
	South Sumatra road reconstruction	39.0	Aug. 1974/Nov. 1976
	North Sulawesi road reconstruction	15.0	Mar. 1975/Feb. 1977
	Bus transport improvements	12.0	May 1974/Dec. 1974
	Electric trains and diesel locomotives	33.0	Dec. 1974/Oct. 1975
	North Java railway repairs	20.0	October 1975
	Sub-total	246.4	
Korea	Railway duplication (North Chōhoku)	43.0	November 1976
Malaysia	Crocker Range road construction	74.0	March 1977
	Sabak Bernam bridge	6.0	March 1977
	Sub-total	80.0	
Philippines	Manila highway interchange	10.0	April 1974
	Department of Public Highways depot and workshops	18.0	April 1974
	Japan–Philippine Friendship Highway	38.0	March 1976
	Philippine National Railway commuter improvements	19.0	April 1974
	Sub-total	85.0	
Thailand	South Highway	57.0	October 1974
	Sathorn Bridge, Bangkok	61.0	Oct. 1974/Mar. 1977
	Sub-total	118.0	

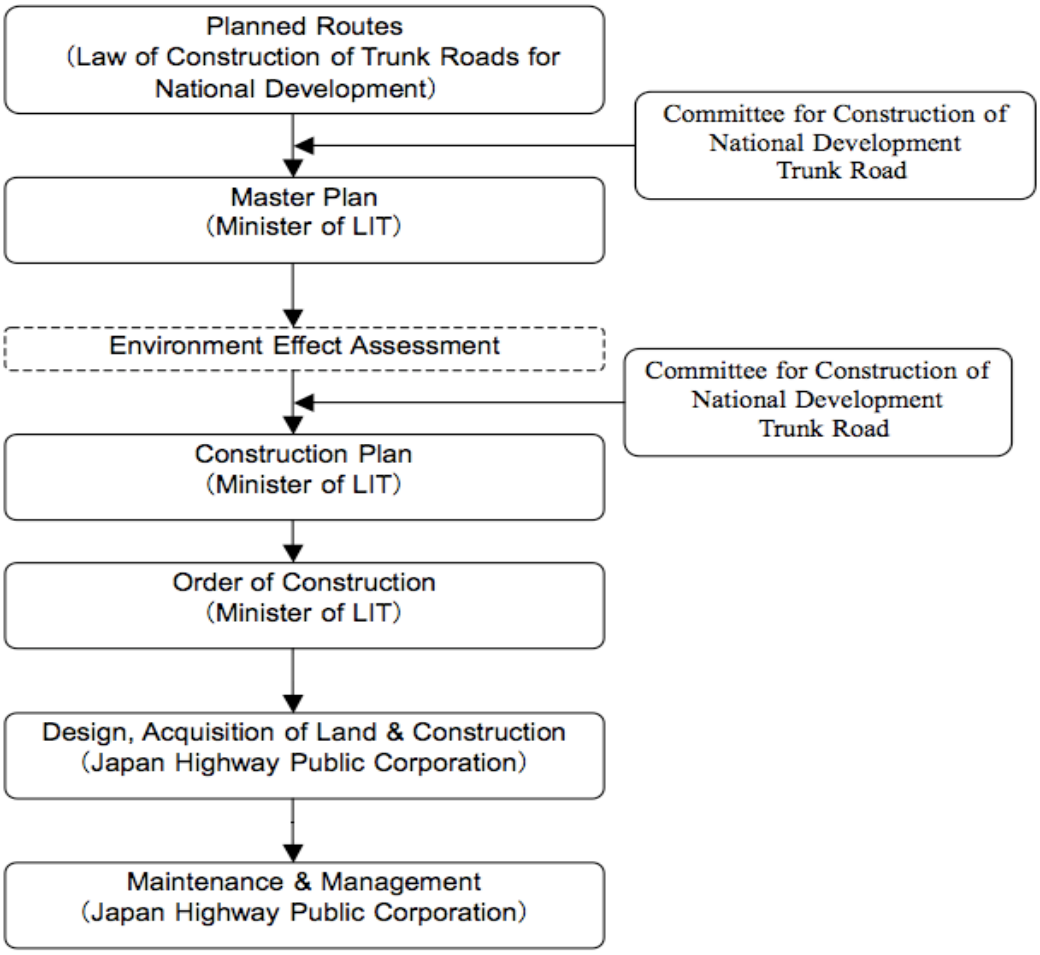
Source: Adapted and translated from Sugawara, 1979.

Source: Black and Rimmer 1982

6.4 Highway and Expressway Network Expansion Under the Japan Highway Public Corporation

Under the JHPC, the national motorways in Japan developed steadily and rapidly since 1957, when the JHPC received authorization for the Meishin (Nagoya-Kobe) Expressway, the first expressway in Japan. Since then the JHPC has been engaged in the construction and management of expressways, especially after 1966 when the National Development Arterial Expressway Construction Law was enacted to provide a comprehensive construction plan covering 7,600 km of national expressways. The construction proceeded from longitudinal national motorways that would establish the backbone network in the Japanese archipelago, and then the other transversal national motorways running through very rugged mountain regions that required long-span bridges and long tunnels were to be developed. While as mentioned earlier, the construction of national expressways was carried out following the orders made by the Minister of Land, Infrastructure, and Transport, generally taking up to 10 to 15 years to complete a whole project.

Figure 6.2 Process of Highway Construction during the JHPC



Source: Mizutani and Uranishi, 2006 (made by the author based on several sources from the Ministry of Land, Infrastructure and Transport)

The final decisions as to which highway would be eventually constructed actually rested not with the JHPC, but with the Ministry of Land, Infrastructure and Transport. The Public Corporation, in this case the JHPC could only construct the highway once the ministry had approved it, and this system supposedly prevented the problem of overinvestment in highways (Mizutani & Uranishi, 2006, p. 6). As it can be observed in the flow chart, the only point where political intervention could exist in highway construction was in the early stages where the master and construction plans were being formulated by the Ministry of Land, Infrastructure and Transport. But political intervention was minimized as the final decision to construct a highway was not only evaluated on the basis of a cost-benefit analysis, but it was taken to the Diet. The JHPC was a non-profit government corporation it was established for the purpose of comprehensive construction and management of expressways and ordinary toll roads covering:

(i) National motorways,
(ii) Regional motorways including toll tunnels and toll bridges,
(iii) Car parks, and
(iv) Service areas.

Thus the JHPC, though technically an independent public corporation, it was placed neither directly within the government nor completely outside the government. Such institutional positioning of the JHPC is said to have worked effectively in keeping

the overall consistency with nation-wide development strategies. Due to the public nature of its operation, the JHPC also enjoyed some exemptions made by national government, with privileges including:

(i) Exemption from various taxes, including corporation tax
(ii) Compulsory collection of tolls and other charges related to expressway operation
(iii) Power of compulsory purchase of land and of administrative enforcement through the Land Acquisition Law
(iv) Loans from the government, bond placement to the government funds, and government guarantee to bonds

Apart from its construction activities the JHPC was effective used as a policy instrument for the Keynesian-type countercyclical macroeconomic fiscal policy, where highway construction was occasionally used as a part of expansionary fiscal policy. The redemption and the cross-subsidization principles facilitated the justification of temporary fiscal expansion by revising long-term repayment plans. This was supposed to have worked at least until the mid 1980s, where the expansion of traffic beyond the baseline forecast easily absorbed such government intervention (p. 8). The JHPC also performed the role to guarantee against the pooling of various risks. In addition to construction delay risks, highway construction is prone to construction cost risks, demand risks, inflation risks, and others. While under the BOT project design, each risk would have to be dealt with separately and there was always a possibility of renegotiations among stakeholders, under the JHPC the whole set of highway construction activities were managed under flexible time scheme and budget. With the JHPC being the central authority in developing highways also enabled a pooling of technology and experts for highway construction. The JHPC in alliance with the construction companies made substantial efforts by using relatively abundant financial resources, to implement and develop one of the most advanced transport systems in the world (to be discussed later).

The toll pooling system and the temporal and spatial cross-subsidization became the essential element of the financing the highway network under the aegis of the JHPC. The distribution of traffic, and therefore the distribution of toll revenues as well, were strongly skewed toward trunk lines such as Tomei (Tokyo-Nagoya) and Meishin (Nagoya-Kobe). It was these revenues that financed the construction of other motorways. The rapid increase in traffic from the 1960s to the 1980s effectively supported the construction of expressway network. If individual-project-based finance had been applied, major motorways would have become free to commuters much sooner, but at the same time other motorways might not have been constructed. The construction of highway network by the JHPC, as mentioned earlier was largely consistent with the nation-wide infrastructure and land development policy objectives, to minimize the political rent-seeking benefits especially associated with large infrastructure projects. From the latter half of the 1950s to the 1960s, investment was concentrated on the main trunk lines. From the 1970s till early 1980s the five longitudinal lines were constructed and since the late 1980s the transversal limb lines.

But from the 1980s, there was already pressure in financing expressway projects as there was also an aspect of social cross-subsidization. Japan was building the Expressway network based on a model to satisfy social demand for the regional development and equal opportunity, rather than commercial or economic cross-subsidization due to external economic effect. While commercial cross-subsidization, being a form of spatial cross-subsidization, cost and/or feeder effects give the operator a motive to build the expressways to increase profitability. In other words commercial and economic cross-subsidization provide rationales for a regional pool system, especially in the case of urban networks in which close interdependence exists among routes, but a nationwide pool system may still not be justified.

To deal with criticism of cross-subsidization and also as part of the efforts to improve the efficiency of administration in general, the government asked the Consultative Council on Roads to inquire into the problem of and determine guidelines to limit cross-subsidization. As a result the Council (1985) made the following recommendations:

(i) For a route that requires cross-subsidization, the amount of cross-subsidies it receives should be limited to half of its costs, and the remaining half should be covered by toll revenues from that route and, if necessary, public subsidies; and

(ii) For a route that provides cross-subsidization, the amount of cross-subsidies it supplies should be limited to reproduction costs of that route. (Kimura & Maeda, 2005, p. 5)

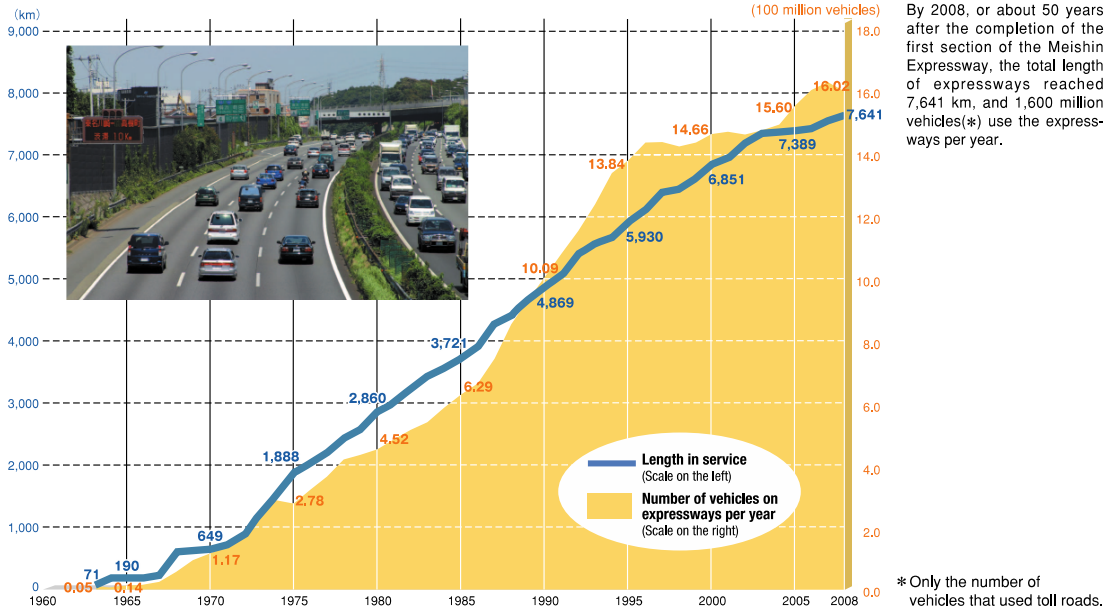
This justified the network development benefits, at the same time the former recommendation gave grounds for partially socially cross-subsidizing new highways on the basis of equity. Equity based on the idea that if others bear part of your costs, you should at least bear the equivalent amount yourself. This rationale was sought to be more readily acceptable by the general public, at the same time allow for further network expansion. In this regard, discretion is really essential as social type of cross-subsidization would be absolutely necessary especially during the network formation, but policy guidance through quantitative restrictions would be a solution. This will raise an alarm when sustainability of building a profitable network might be jeopardized, although the service being provided is socially equitable. The Council's proposal was an attempt in this direction, to providing a quantitative guideline. The implication was that the traffic volume should bear half of the cost of building that route, although the constructing the route is could be requisite from standpoint of balanced regional development or equal opportunity; but then in case of insufficient toll revenue from users of that route, should not be supplemented by cross-subsidization, but by public subsidies.

The fourth National Comprehensive Development Plan (NCDP) was established in 1987, and the expressway construction plan was to expand the network from a 7600 km (planned a decade earlier) to 11,520 km and an addition 3,920 km to total about 14,000 km The new scale and layout of the network was to be determined to meet the demands of the time, on a new revised criteria of connecting of all cities having a population of 100,000 or more, and the ability to access the nearest interchange (of the expressway network) within two hours. The new criteria, in effect also increased the scope for equal opportunity and access to the network. As it was already becoming obvious, the need to construct expressways and toll road systems rapidly and at service levels to match economic development was fulfilling its intended purpose. In spite of a legal provision for providing expressways at no charge when the construction cost was repaid entirely, it could not be actualized as the pool system was introduced. Thus, the possibility for free access to expressway routes that recovered construction cost was postponed until the redemption of the entire pool.

There were two other challenges: there was a marked improvement the quality of the general (free-access) roads running parallel to the expressways. The Ministry of Construction was directly responsible for these general roads. The increased competitiveness of these general roads was expected to place a limit on cross-subsidization in expressways. Two decades ago, it was already realized that the over dependence upon cross-subsidization in the construction and quality of expressways was going to add pressure in financing and would become economically contentious. Even if the burden per user providing cross-subsidization is relatively small and no great inefficiency or unfairness will occur, this would be especially valuable in the short run when the network formation is a priority, to enable equal access spatially and in terms of cost. But this kind of social-subsidization in the long run will inevitably lead to heavy financial losses result in inefficiency. As Figure 6.3 suggest the

expansion of length of expressway in general was in line with the number of vehicles using the expressway (in 100 million vehicles), but obviously the graph is does not indicate which routes were used more and were profitable.

Figure 6.3 Length of expressways and the number expressway users per year (*)



Source: MLIT (http://www.mlit.go.jp/road/road_e/pdf/chapter05.pdf)

6.5 Pricing System: Full-Repayment Principle and the Toll-Pooling System

Toll rates were determined under the full-repayment (or redemption) principle, within the overall scheme of the toll pooling system. The full-repayment principle assumes that the total costs of the construction of highways, including costs of land acquisition and interest payments, and highway service costs such as maintenance costs including administration costs, must be repaid by toll revenues collected over a pre-fixed period. After the repayment of all construction costs is completed, the highways are then converted to toll-free roads. The redemption principle is based on the ultimate motive that the highways being a part of a social infrastructure which the government should be able to provide without collecting user charges, as the government does not charge for the use of other infrastructure services. However in Japan, because of the budget constraints in the general account, and the government's intention to quickly create a modern and efficient highway system prompted the implementation of the full repayment principle as an alternative approach. Under this system the highway network was constructed by money borrowed and debts are repaid with the pooled tolls of the highway users.

The pooling system of toll revenues becomes the second crucial aspect of the Pricing System. The JHPC tolls revenues from each highway route that is then pooled together in order to repay the debts and costs incurred in building the network. The toll rate then cannot be set separately for each route, but instead is set in the context of the entire network. Therefore, the toll level is set by making even the toll revenues collected from all the routes for a set of time period, to cover the total cost. This opposed to the conventional toll system where the toll rate was determined independently for each route (so that a route's toll revenue would cover its own costs), was designed to cross-subsidize among routes. In operation, when the first motorway

the Meishin line was opened in 1963, it was expected that it would take 30 years to completely repay the route's construction costs. But by 1972, when the JHPC that had started to pool toll revenues of all national motorways to repaying the network's debt, the Meishin route had to continue its tolling operation throughout. In this way when an older line in spite of completely repaying in full its construction costs, it has to continue to contribute repaying the debts of newer lines; and this has never allowed the Japanese Highway system to become free to use.

The equation that was used to calculate the highway toll was as follows (Mizutani & Uranishi, 2006, p. 8):

Equation 2 Pricing Equation for Japanese Highway Toll

Pij =(pTL+pt)(1+t)
Where, PiJHPCighway toll between lamp i and lamp j p : Unit price per km TL : Travel length (km) pt : Terminal charge tc : Consumption tax (5%)

This then translates into the following toll rates:

Table 6.3 The Toll Rates as of 2001

Type of Vehicle/charge	Cost
Terminal charge	150 yen per single use
Light car and motorcycle:	19.68 yen/km
Ordinary passenger car:	24.60 yen/km
Small and medium-sized truck:	29.52 yen/km
Large-sized truck:	40.59 yen/km
Special large-sized full trailer:	67.65 yen/km

Source: Mizutani & Uranishi, 2006, p. 7

It has been observed that the toll level of the Japanese highway system is much higher than in other developed countries. For example, the unit toll level in Japan is 24.6 yen per km, while it is 6.4 yen in France, 5.1 yen in Italy and 3.7 yen in Korea (p. 8). Where Japan has distinct features that can explain to the higher costs (that would reflect higher tolls):

1. Including the presence of mountainous regions, which would result in higher investments in infrastructure in order to build tunnels and bridges.
2. The possibility of earthquakes also require more expensive anti-earthquake infrastructure.
3. While natural conditions are one part of the explanation in justifying for higher toll level in Japan, the possibility that the full repayment principle and the pooling system could also be an explanation to the higher tolls.

6.6 Strain on the JHPC: Welfare Costs Of Expressway Construction and the Financial Structure of Japan Highway Public Corporation

While mentioned earlier, the government had an initial plan of building national motorways of 7600 km in 1966, it was then extended in 1987 to cover 14,000 km nationwide. Of this additional 6400 km, the JHPC was in charge of constructing 3920 kilometers of national motorways and another 2300 km of regional motorways (*Ippan Kokudo jidosha senyo doro*), with the Honshu-Shikoku Bridge Authority in charge of constructing the remaining 180 km As of the end of March 2001, 6851 km of the network was opened, and another 2491 km were included in the construction plan (*Seibi Keikaku*) as they were finishing their environment impact assessment. But by then in 2001 and 2002 the policy debates on expressway constructions was already intense, especially regarding the financial state of the JHPC and the welfare arising from the expansion plan.

Although the then financial position of the JHPC appeared healthy, with toll revenues at 1.87 trillion yen (in FY 2000) exceeding the sum of operating costs (369 billion yen) and interest payments (576 billion yen). And as of March 2003, the total funds that the JHPC has raised since its establishment was 62.3 trillion yen, of this direct government subsidies and government capital funds was only 4.1 trillion yen, and the borrowing from the World Bank was 137 billion yen (Kimura & Maeda, 2005, p. 7). The Japanese government's decision to finance the JHPC (to construct and operate the almost entire expressway system) through toll revenues and the fiscal investment scheme through issuing bonds; allowed the government to avoid itself the heavy financial burden. In this regard four highway-related agencies borrow construction costs from the Fiscal Investment and Loan Program (FILP, to be discussed later), operate toll roads, and repay construction costs by toll revenues.

However, the stress on JHPC is hidden with the profitability that varies widely among routes. Table 6.4 presents the data from Iwamoto (2002) study, which measures the rate of return of each line For the Year 2000, using the information obtained from the JHPC annual reports. The rate of return is computed by:

Equation 3 JHPC Rate of Return Calculation

$$\text{Rate of return} = \frac{\text{Operating Surplus (Roll Revenues minus Operating Costs)}}{\text{Book Value of Roads}}$$

This data can simply reveal whether an expressway line can repay, or recover its construction costs. As Table 6.4 indicates that although old lines, which have a high opening rate can achieve a very high profitability, however the rates of return to newer lines are quite low. Expressway construction obeys the rule of diminishing return; where the more recent the construction, less will be the traffic volume (Iwamoto, 2002, p. 595). Especially when the rate of return falls short of the interest rate, it is suggests that the construction cost will not be repaid. Apart from being able to notice underutilization of motorways while observing the traffic on the expressway, there is more discontent with the profitability of the new lines it also raises questions to the solvency of JHPC, which continued to construct cross-subsidized routes.

As the data suggests the older lines: Chuo, Higashi Kanto, Meishin, and Tomei lines have already repaid their construction costs and earned 514 billion yen of operating surplus in FY 2000. Fairly newer lines: Kinki, Kyushu, Meihan, and Tohoku

routes still have a little debt that has not been repaid but they still earned a 368 billion yen of operating surplus. The huge cash rich routes with a huge operating surplus, enables the JHPC to pay off the interest of 576 billion yen even after they lose 306 trillion yen to other lines(p. 595). Neither solvency nor current profit is a good measure of judging the business of JHPC. According to Iwamoto (2002) the two main concerns for the financial health of JHPC was a potential interest rate hike (as Japan currently has a very low rate), and the unsustainability of continuing the pooling principle as the cross-subsidization scheme will only increase the share of unprofitable lines. Other issues that discouraged the JHPC in continuing building inefficient routes were the over optimistic projection of future traffic, and in fact many of the new lines were running parallel to old lines which would only lead to traffic diversion, and there would be no real increase in the traffic volume.

This brought into concern the welfare costs of the construction plan (Seibi Keikaku), which was estimated to spend 22.7 trillion yen to add 2491 km to the existing network, at that time (2001). Apart from the expanding the national motorways of 2341 km, the building regional motorways of 2300 kilometers, where the traffic will be much lighter, also raised serious doubts in terms of welfare cost. On top of that, the national government finances a large part of construction costs of regional motorways with gasoline tax revenues, to help keep the operation of toll roads sustainable. This will mean that a substantial part of such subsidies, which do not appear on the financial statement of the JHPC, will result in social waste (which cannot even analyzed as the JHPC does not disclose adequate date for these expressways).

Table 6.4 Rates of Return of National Motorways by Line (Fiscal Year 2000)

Lines	Length in operation (kilometer)	Opening rate (percent)	Book value of road (billion yen)	Operating surplus (billion yen)	Rate of return (percent)	Welfare gains (billion yen)
Do-o	349	73	1,007	18	1.76	−565
Sapporo, Doto	131	32	365	6	1.70	−210
Tohoku, Tokyo Gaikan	698	100	2,126	188	8.83	2,567
Hachinohe	68	70	212	2	0.94	−162
Akita	123	74	345	3	0.90	−267
Yamagata	125	91	481	3	0.69	−398
Banetsu	213	100	752	11	1.50	−469
Kanetsu	246	100	1,394	81	5.78	619
Joshinetsu	203	100	1,205	27	2.27	−522
Joban, Tokyo Gaikan	200	64	1,161	69	5.95	566
Tateyama	35	64	338	9	2.63	−116
Higashi Kanto	75	67	400	46	11.51	750
Shinkuko	4	100	4	0	9.52	6
Kita Kanto	55	41	373	1	0.35	−341
Fuji Yoshida	94	100	373	42	11.31	682
Chuo, Meishin	462	99	1,948	195	9.98	2,914
Nagano	76	100	527	17	3.30	−92
Tomei	347	100	1,539	231	15.01	4,237
Tokai Hokuriku	145	78	886	6	0.70	−731
Daini Tomei	5	2	161	0	0.00	−161
Hokuriku	487	100	1,852	67	3.63	−169
Ise	69	100	203	11	5.57	80
Meihan, Kinki	137	88	978	91	9.32	1,300
Daini Meishin	5	3	58	0	0.17	−55
Hanwa	73	36	456	25	5.55	177
Maizuru	87	54	324	6	1.82	−176
Kansai Kuko	7	100	156	1	0.45	−139
Chugoku	543	100	1,245	66	5.27	395
Sanyo	445	100	2,853	108	3.78	−158
Okayama, Yonago	107	96	355	4	1.15	−253
Sanin	14	10	52			
Hiroshima, Hamada	71	100	176	3	1.76	−98
Matsuyama, Tokushima	222	100	1,107	16	1.44	−709
Takamatsu, Kochi	155	55	828	12	1.42	−533
Kyushu	345	100	1,132	89	7.85	1,090
Miyazaki	83	100	153	6	3.59	−16
Kanmon	9	100	41	4	9.69	59
Nagasaki, Oita	246	88	1,050	33	3.15	−222
Higashi Kyushu	38	12	151	0	−0.07	−154
Okinawa	57	100	217	7	3.27	−40
Total	6,851	73	28,982	1,505	5.19	8,685

Notes. 1. Length in operation, opening rate, book value of road, and operating surplus are taken from Annual Report 2001, Japan Highway Public Corporation. The operating surplus is toll revenues minus operating costs. Rate of return is the operating surplus devided by the book value of load. Welfare gains are the product of the book value of road and (the rate of return −4%)/4% 2. Annual Report 2001 of Japan Highway Public Corporation does not report the operating records of Sanin Line. The report does not think they are informative, because Sanin Line opened very late in FY 2000.

Source: Iwamoto 2002

The work done by Mizutani and Uranishi (2006 and 2008), extensively documents the Financial Structure of the JHPC, outlining the Revenue and Cost structure data. As for the revenue structure, there are three main sources of revenue (Refer toTable 6.5):

i) Service revenue from highway toll charges and highway facility user charges such as parking and tenant rents,
ii) Government subsidies,
iii) Others (that include revenues contracted-in, and revenues from non-road service).

Table 6.5 Revenue Structure of JHPC (¥Million)

FY	Service Revenues			Government Subsidy	Others	Total Revenues	Service /Total Revenues
	Toll Revenues	Other User Charges	Sub Total				
1956	261	0	261	-	113	374	69.8%
1960	2,253	74	2,327	-	268	2,595	89.7%
1965	14,832	420	15,252	-	340	15,592	97.8%
1970	78,989	1,139	80,128	-	1,247	81,375	98.5%
1975	248,169	2,041	250,210	12,811	1,831	264,852	94.5%
1980	504,915	3,788	508,703	38,231	4,316	551,250	92.3%
1985	839,115	4,234	843,349	88,773	7,876	939,998	89.7%
1990	1,421,425	79,375	1,500,800	10,891	5,738	1,517,429	98.9%
1995	1,913,348	7,948	1,921,296	132,585	7,053	2,060,934	93.2%
2000	2,096,233	12,999	2,109,232	87,716	8,889	2,205,837	95.6%
2003	2,069,939	15,258	2,085,197	-	23,718	2,108,915	98.9%
'00/'70	26.5	11.4	26.3	6.8*	7.1	27.1	0.97

(Note):
(1) This table was made by the authors based on the Japan Highway Public Corporation's Annual Profit and Loss Statement.
(2) Unit: million yen
(3) "Other User Charges" include (i) user charge for exclusive use of road, (ii) revenues from parking lots, (iii) revenues from SA, (iv) revenues from truck terminals, and so on.
(4) "Others" include (i) revenues by contracted-in, (ii) revenues from non-road service revenues, etc.

Source: Mizutani and Uranishi 2006

After 2000 the service revenues reached the maximum amount over ¥2 Trillion, accounting for 98.9% of total revenues in 2003.

From the cost side of the current financial statement it gets more complicated than the revenue structure, as the accounting system also changed in 1986 (refer to Table 6.6). The costs are categorized into:

(i) Road Service Costs: general administration costs and maintenance costs of already constructed highways
(ii) Depreciation
(iii) Non-road Service Costs: the costs of interest payment on bonds and loans, and so on
(iv) Reserves
(v) Repayment Fund: pooled money for debt repayment

Table 6.6 Cost Structure of JHPC (¥Million)

FY	Road Service Costs	Depreciation	Non-road Service Costs	Reserves	Repayment Preparing Money	Total	Road Service/ Total
1956	172	28	288	0	-	488	35.2%
1960	746	529	1,744	146	-	3,165	23.6%
1965	3,326	3,421	12,347	1,357	-	20,451	16.3%
1970	11,110	10,801	49,726	5,661	-	77,298	14.2%
1975	45,560	75,827	142,527	5,988	-	269,902	16.9%
1980	102,346	167,576	283,315	8,483	-	561,720	18.2%
1985	166,296	202,739	572,742	19,188	-	960,965	17.3%
1990	267,407	14,093	765,482	25,510	443,074	1,515,566	17.6%
1995	346,892	19,648	958,668	30,411	704,615	2,060,234	16.8%
2000	398,633	24,282	817,085	39,233	924,561	2,203,794	18.1%
2003	366,198	26,811	556,483	46,015	1,112,065	2,107,572	17.4%
'00/'70	35.9	2.2	16.4	6.9	-	28.5	1.3

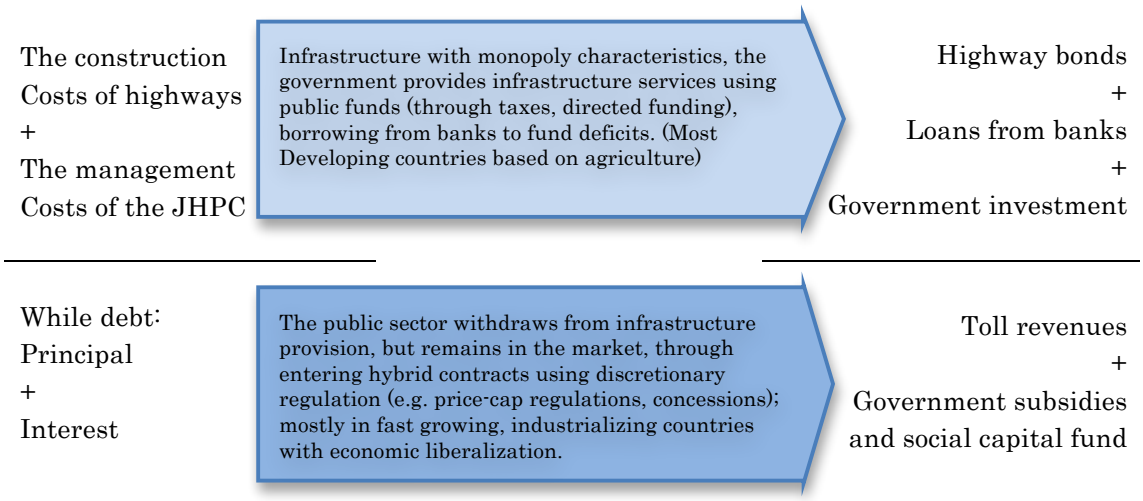
(Note):
(1)This table was made by the authors based on the Japan Highway Public Corporation's Annual Profit and Loss Statement.
(2) Unit: million yen
(3) Road Service Costs consist of general administration costs and maintenance costs of highways.
(4) Non-road Service Costs are interest payments on bonds and loans, etc.
(5) Repayment Fund is pooled money for the repayment of debts.

Source: Mizutani and Uranishi 2006

The change in accounting rules in 1986 resulted in 'Depreciation' being accounted for, and replaced by another category, the 'Repayment Fund', which refers to pooled money for repayment of debts. The significance of the cost structure is that road service costs more recently only 17 - 18% of the total costs since the 1980s; suggesting that most of JHPC's costs are capital costs. In macro perspective the financial structure appears healthy in spite of the huge amount debts accrued, in hindsight the argument is that it could have been avoided if JHPC had stop new construction.

To simplify it further according to Miyagawa (Mizutani & Uranishi, 2006, p. 8) summarizes the highway business as follows:

Figure 6.4 Highway Financing and Repayment



So in this way if the JHPC constructs more highways than its repaying ability using toll revenues and government subsidies, then its debts will accumulate and balloon, as the JHPC has to depend on highway bonds and loans. This in fact, is the cause of the accumulated debts of the JHPC reached that reached to a whopping 2,070 billion yen by the end of 2003. This (debt) in turn became the trigger for the eventual privatization of the Japan Highway Public Corporation.

By this time Japan are so-called "highways" or "expressways," mostly national motorways in Japan, reached 7,197 km as of April 1, 2003, which constitutes only 0.6% in the total road length of 1,187,638 km as of 2004 (refer to Table 6.7). By this time the roads in Japan were classified into four categories:

(i) National motorways,
(ii) National roads,
(iii) Prefectural roads,
(iv) Municipal roads

However, highways carries 6% of total transport (kilometers times number of cars) and 24% of total domestic cargo transport. Although expressway network in terms of length is still low for Japan compared to other major western countries, the trunk routes of the network have been roughly completed, expressways have also reached new levels of technological advancements (to be discussed later).

Table 6.7 Comparison of Road Length Amongst Selected Developed Countries

Country	Highway length	National and trunk road length	Regional road length	Other road length	Total road length
USA	89 859 (1.4%)	613 057 (9.6%)	698 600 (11.0%)	4 976 638 (78.0%)	6 378 254 (100.0%)
Germany	12 037 (5.2%)	41 246 (17.8%)	86 868 (37.5%)	91 430 (39.5%)	231 581 (100.0%)
UK	3 476 (0.6%)	46 633 (7.5%)	115 164 (18.6%)	454 095 (73.3%)	619 398 (100.0%)
France	10 390 (1.2%)	25 900 (2.9%)	355 000 (39.8%)	500 000 (56.1%)	891 290 (100.0%)
Japan	7 296 (0.6%)	54 084 (4.6%)	128 084 (10.8%)	997 296 (84.0%)	1 187 638 (100.0%)

Note:
(1) The original source of these numbers is the World Road Statistics (2004) by the International Road Federation. Numbers are from 2003 for USA, Germany, UK and France, from 2004 for Japan.
(2) Unit: km.
This table is compiled by the authors based on information from Road Economic Research Institute and Research Circle of Road Transport Economics (2006, p. 247)

Source: Mizutani & Uranishi, 2008

6.7 Unique Postwar Public Agency Financing Initiatives: The Postal Savings and the Fiscal Investment Loan Program

Something unique in Japan's financing of public initiatives including the National Highways, was the FILP (*Zaisei Toyushi*) system that was enacted through the Trust Fund Law in 1951. This was a unique financing program was established to provide interest-bearing funds for targeted policy areas as a part of fiscal policy administration in combination with tax revenues. This was a practice that was traced back since the Meiji era where the government would gather funds through deposits invested in public bonds (till 1897), apart from using tax proceeds to undertake public economic activities (Kaneko & Metoki, 2008, p. 236). And since 1910 these funds were

invested in special-purpose banks to support new areas of fiscal activity, as the government was involved in new developmental activities. The FILP system as it was used in coordination with the budget to achieve policy objectives it was also was referred to as the second budget.

For the year 1953 budget, already consisted of three parts (entrance, mid, and exit). The entrance side of the FILP was central government's special accounts that had a financial surplus a large share taken by the postal savings and public pension funds. The Trust Fund Bureau allocated the money among the exit side to a variety of special accounts and special public institutions (mentioned below). Fundamentally the FILP system served as a financial intermediary between savings pooled from ordinary citizens into public institutions, which could then be used to implement fiscal policy. Over time the FILP also sourced:

i) Primarily from postal savings and pension reserves that were required by law to be deposited in the Trust Fund Bureau of the Ministry of Finance.
ii) In addition, it also included:
   - The reserves and surpluses of government special account
   - Premiums of the postal life insurance

In turn the FILP funds were allocated as investments or loans to various government special accounts, including:

i) Government-affiliated financial institutions,
ii) Local governments,
iii) Public corporations and other public institutions. These agencies are called FILP Agencies and can be roughly classified into two groups:
   (a) Financial institutions, In the case of financial institutions, they lend the allocated FILP funds to the private sector to realize certain policy objectives such as fostering advanced technologies, supporting small businesses and preventing environmental pollutions. Such as the former:
      - Japan Development Bank (current Development Bank of Japan)
   (b) Public corporations that carry out construction of such social infrastructures as toll-roads and airports based on the government policy. Such as the former:
      - Japan Highway Corporation (current three regional expressway companies).

These funds played a strategic role in the rapid economic growth, especially in the 1950s by providing the required investment to basic and export industries such as electric power, iron, steel and shipbuilding through government-affiliated financial institutions (p. 237) like the Japan Development Bank and Japan Economic Research Institute. As in the 1950s long-term funding was scarce, due to the rapid increase in lending by private financial institutions and the absence of capital markets. During the early 1950s, the FILP supplied 28.3% of total corporate funding, and for the four basic industries mentioned above (electric power, shipping, coal and iron and steel), the percentage was slightly higher at 37.2% . The FILP system provided the long-term, fixed and low-interest financing from interest-bearing funds (postal savings, pension reserves and so on), which private financial institutions could not provide.

Among the other funding the postal savings funds have been really crucial in the FILP. Studies (p. 237) suggest that the share of postal savings within the FILP system ranged from more than 25% in 1955, up to 40% in 1975 and 1980, and dipped back to 31.0% in fiscal 1995 and 27.3% in fiscal 1997. Since 1875, when the postal savings system was put in place until March 2003, it managed to hold up to a 250 trillion yen at the end of fiscal 2000, mostly in the form of 10-year time deposits. The

postal savings system, which was administered by a government ministry, benefitted from the postal system of around 24,000 post offices located nationwide, was crucial in channeling the savings of ordinary citizens. Even recent statistics that break down household financial assets, suggest that postal savings accounted for about 20% of all the household financial assets. The trend was that it shrunk during the bubble, where even in fiscal 1980, the ratio was at 16.7%, it rose again as people's confidence in the private financial institutions diminished due to their problems of non-performing loans (NPL).

As outlined above the core of the FILP funds managed by the Trust Fund Bureau, included postal savings, pension reserves and surpluses in other special accounts, which was then invested in Japanese government bonds, or loaned them to the FILP agencies. Also, ever since the inception of the FILP the interest rate on the Trust Fund Bureau's deposits were determined by law. As at that time the interest rate system in the financial markets were also strictly regulated, maintained in such an order from deposit rates of banks and postal savings, government bond interest rates, lending rates of the FILP agencies to long-term prime rate. In other words the circumstances were created where the FILP could provide long-term loans at below market lending rates.

But things had to change after the oil crises, when the Japanese economy was moving towards depression and the government increased spending in order to revitalize the economy. This started a chain of events that would affect the financial market. As the funding for stimulus spending could not come from tax revenues, because it was already decreasing, forced the government to establish a bond market so that it could issue huge amounts of bonds in the market. Since the early 1980s, the amount of off shore money transactions also increased requiring arbitration between and offshore and inland financial assets. This and in the late 1980s when reduced corporate demands for credit and the interest rates started falling as the yen was getting stronger, hastened the eventual liberalization of interest rates. When in January 1987 the long-term prime rate went even below the deposit rate of the Trust Fund Bureau, the law determining deposit rates of the Trust Fund Bureau had to be revised a month later. The new legislation allowed the cabinet to determine the rates based on the market rates, especially the Japanese government bond interest rates. The deposit rates of the Trust Fund Bureau became inevitably linked to the Japanese government bond interest rates so as to ensure the sound management of postal savings and pension reserves (Kaneko & Metoki, 2008, p. 239).

Since then as the financial market continued to be liberalized, the discrepancy between the Trust Fund lending rate and the long-term prime rate reduced, but that in effect led to another contention. This was the competition between the private banks and the FILP agencies in the market; with similar interest rates it obviously was becoming more difficult for the FILP to provide preferential financing. But before long the FILP's relevance was restored when the economic slowdown following the collapse of the bubble economy, allowed the FILP in providing additional funds to cope with reluctance of private financial institutions' to lend money to businesses.

But the biggest twist came when in 1996 Mr. Hashimoto (Prime Minister, 1996–1998) wanted to also delink the FILP with the postal savings and pension reserves, as part of his government-wide reform undertaking through establishing the Administrative Reform Council. Among the reform measures deliberated by the council, the working group of the Fund Management Council of the Ministry of Finance through financial experts sought to reform the FILP. The report of the working group was included in the final report of the Administrative Reform Council in December 1997, which also proposed a postal service re-organization. A law was then stipulated that the FILP system was to be reformed based on the market principles no longer linking it to the postal savings and the pension reserves. The far fletched reform also

suggested that the postal service organization would be transformed from a government ministry to a state-run public corporation.

The fundamentally reform of the FILP was carried out in April 2001, changing the mechanism of fund raising and fund operations. The mandatory deposit of postal savings and pension reserves into the FILP was abolished, and these funds could discretionarily be invested in the financial markets, in effect mainly in Japanese government bonds. In terms of fund operation, the FILP agencies as they were no longer entitled to the FILP funds, in principle were now allowed to issue their own bonds in the financial market to raise the funding required for their projects. In case the FILP agencies were unable to raise the funding on their own, there was a condition that allowed the government to raise it on behalf of them by issuing Japanese government bonds, only if the projects were considered indispensable in achieving the governments overall policy objectives. Even this was in accordance with fiscal discipline, where the FILP bonds were to be issued under a new special account, Fiscal Loan Fund Special Account, which is segregated from the general account.

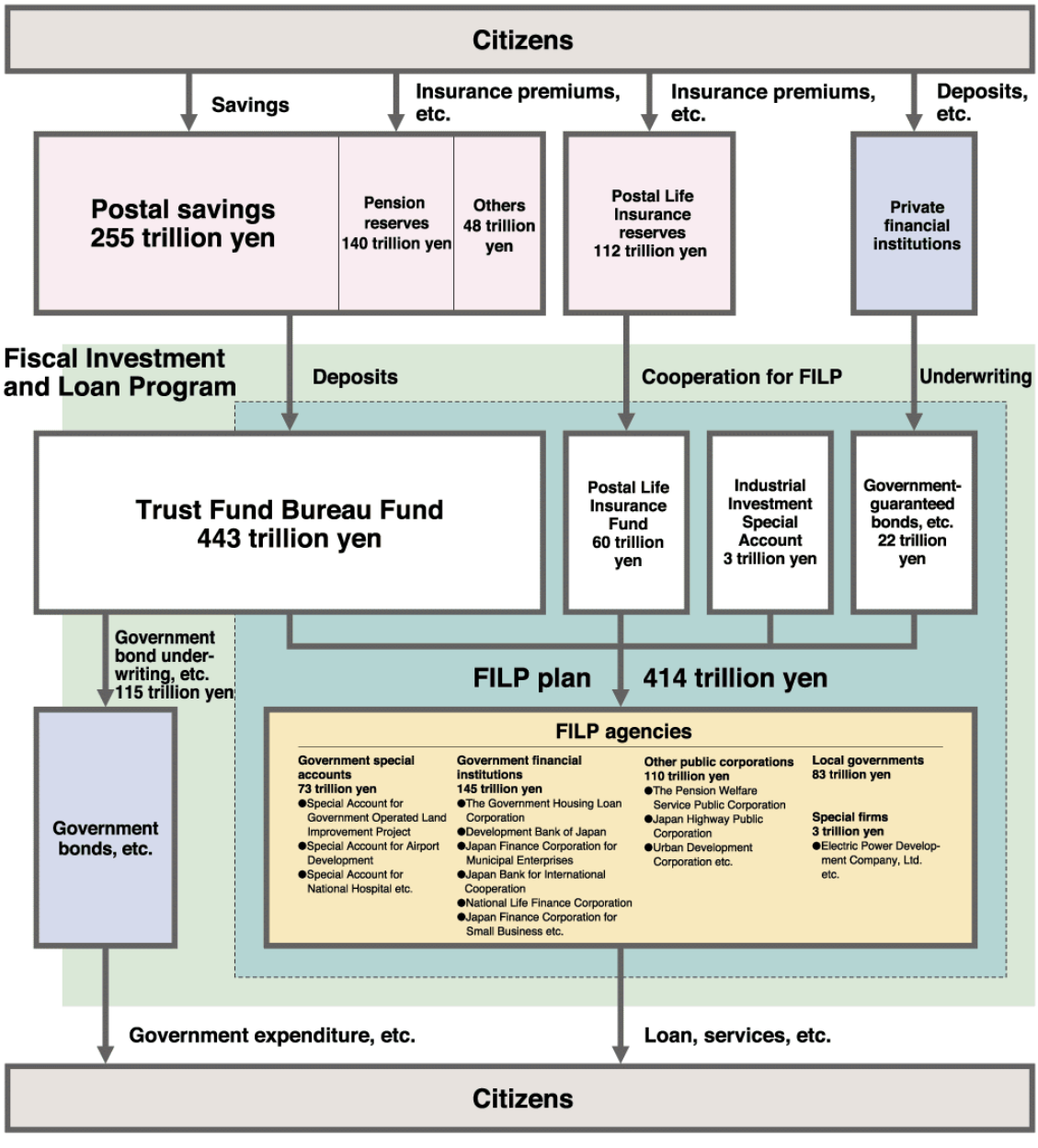
In April 2003 a state-run public corporation, Japan Post was established based on Mr. Hashimoto's reform blueprint under the aegis of the then Prime Minister, Mr. Koizumi (Prime Minister 2001–2006). According to the 'Basic principles of the privatization of Japan Post' (Cabinet decision, September 2004), one of the three merits of the privatization was the channeling of funds from the public sector to the private sector, to enhance the utilization of households' savings and to revitalize the national economy. In order to realize this principle, making an ordinary private-commercial bank from a public financial institution was the top priority behind creating whole framework for privatization. As a result, the postal savings service was converted into a Postal Savings Bank, as an ordinary commercial bank that was no longer obligated to fund public initiatives. As for the discretionary investment of postal savings, 201 trillion yen was invested (at the end of fiscal 2005) in securities, mainly Japanese government bonds accounting for 71.8%, and deposits to the Fiscal Loan Fund accounting for 23.2%. All the deposits to the Fiscal Loan Fund were to be repaid in fiscal 2007 (Kaneko & Metoki, 2008, p. 240). The controversial aspects, that is beyond the scope of this thesis was that although privatization happened, most of the discretionary funds were now invested in government bonds, and that the Postal Savings Bank would lead to the financial exclusion, as it no longer obliged by law to provide Universal Services in its Postal Savings Services.

6.7.1 *The Fiscal Investment Loan Program and Highway Financing*

Having outlined the evolution and the circumstances under which reforms occurred to the FILP and the Postal Savings System, this section will relate it to the FILP agencies especially the JHPC and Highways. As according to Iwamoto (2002, 583) among infrastructure construction projects that the FILP supported, the largest welfare loss lies on national motorway construction (of the Japan Highway Public Corporation *Kosoku Jidosha Kokudo*), which was estimated to be about 14.5 trillion yen of welfare loss. Iwamoto's study substantiates the earlier sections ramification; that the FILP was a system that worked very well in a postwar reconstruction period, but was misdirecting a well-developed market economy. Where the FILP functioned as a kind of government intervention to the financial sector, which was under-developed and the FILP became crucial in the Post-war reconstruction efforts and infrastructure financing. But as the financial sector started to develop, with increased PSP in the financial markets, the role of the government should have been restricted, and this represents a common problem that the Japanese economy faces at large. shows the amount lent from the FILP for JHPC. Although there were only few years of data that were recorded clearly as to giving a break up for which subsector arranged for how

much of the loan. Most of the contributions came from the Postal Life Insurance Fund, and less than 10% came from government guaranteed bonds. FILP agencies, such as the Japan Highway Public Corporation, were also able to issue bonds on the financial market. In this way, the government using the FILP could guarantee the bonds issued by the FILP supported agencies, so that the institutions could also smoothly procure funds from the financial system. Figure 6.5 provides the flow of funds in the FILP system that allowed for the postal savings and private financial institutions to provide the financial intermediation in funding the FILP agencies.

Figure 6.5 Fiscal Investment and Loan Program System



Source: http://www.mof.go.jp/zaito/zaito00/p06_09e.html accessed November 18th 2010

Doi and Hoshi (Iwamoto, 2002, p. 585) estimated that the bad loans of the FILP would cost at least 78.9 trillion yen. This staggering figure only reveals the scale of NPL and the unqualified funding activities the FILP was involved in; leading to the

"fundamental reform of the FILP" in April 2001 carried out by policy makers. As the reforms Postal system and FILP reform have already been discussed, the Koizumi administration in December 2001 also reformed the special public institutions (*tokushu hojin*) including the JHPC under the government-wide reform program. Incidentally the majority of agencies that were affiliated with the FILP were special public institutions, and the FILP reform would inevitably lead to all their privatization or abolishment. Table 6.8 outlines the lending under the FILP between 1995 and 2008, where most of the funding came from the Postal Life Insurance fund, Trust fund Bureau, and the government guaranteed bonds respectively.

Table 6.8 Amount of Lending Under FILP Fiscal Year 1995 - 2008 to JHPC (¥Billion)

FY:	Amount Lent to JPHC	Estimated Outstanding amount of FILP at previous year end for JHPC Financing				Total Outsanding amount of FILP
		Trust Fund Bureau Fund/Fiscal Loan	Postal life Insurance Fund	Government-guaranteed bonds	Total	
1995	1910.30	n/a	n/a	n/a	n/a	n/a
1996	1926.00	7,353.90	11,211.70	1,936.00	20501.60	n/a
1997	2190.00	7988.1	11383.4	1608.9	20980.40	394861.90
1998	2023.60	8,716.70	11,049.90	1,477.90	21244.40	400798.30
1999	2241.20	9082.9	10,791.90	1,531.30	21406.20	414269.60
2000	2100.00	n/a	n/a	n/a	21686.80	414800.00
2001	2154.00	n/a	n/a	n/a	21730.30	396100.00
2002	2118.00	n/a	n/a	n/a	22173.60	368300.00
2003	2130.00	n/a	n/a	n/a	21772.50	348300.00
2004	2213.00	n/a	n/a	n/a	21617.10	312900.00
2005	2142.00	n/a	n/a	n/a	21583.90	271100.00
After 2005 the JHPC reformed to Japan Expressway Holding and Debt Repayment Agency (JEHDR Agency)						
2006	2182.90	n/a	n/a	n/a	28773.40	224000.00
2007	2475.00	n/a	n/a	n/a	28291.20	192200.00
2008	2383.00	n/a	n/a	n/a	27680.60	n/a
2009	1,816.0	n/a	n/a	n/a	n/a	n/a
JHPC is a part of the other semi-government bodies financed by the FILP and later as Independent Administrative Agencies						
n/a: data not available at the given source						

Source: Author's calculations from http://www.mof.go.jp/zaito/zaito00/p35_43e.html#04 accessed December 18th 2009

The government financial institutions (eight agencies) and expressway construction (four including the JHPC) received most of the lending. The JHPC received as much as 2.118 trillion yen as new lending in 2002, including the other highway agencies it adds up to 3.042 trillion yen. In order to measure the size of inefficient activities the FILP was involved in the government made some attempts to quantify policy costs by introducing a 'subsidy cost analysis' in 1999. As the next table lists the major 15 FILP agencies and their new borrowing from the FILP in FY 2002, that accounted for 96.4% of FILP loans excluding the local governments. The subsidy cost analysis estimates the present discounted value of the subsidies attributed only to the existing activities of the FILP agencies, basically assuming that the agencies do not launch a new project. This data on Table 6.9, suggests that the JHPC has the largest amount of subsidy costs amounting to a 1.794 trillion yen. Iwamoto further suggests that apart from huge losses in welfare costs, the budget expenses or policy costs do not necessarily result directly in a social waste if the subsidized activity can actually create enough social benefits. But in this regard there could be an enormous social waste,

when the public sector substitutes the activities of the private sector, distortion caused by the government subsidies, and when money is lost through nonperforming loans underutilized infrastructure.

Table 6.9 Major FILP Agencies and their Funding (Fiscal Year 2002)

	New lending	FILP agency bonds[1]	Subsidy costs[2]	Subsidies[3]	Policy costs[4]	Proposed reform[5] (billion yen)
Local governments	7,600					
The Government Housing Loan Corporation	4,967	600	−435	376	433	Abolish
National Life Finance Corporation	3,530	200	18	28	115	
Japan Highway Public Corporation	2,118	400	1,794	0	−294	Privatize
Japan Finance Corporation for Municipal Enterprises	1,532	220	9	0	−192	
Japan Finance Corporation for Small Business	1,371	200	77	23	104	
Japan Bank for International Cooperation	1,287	200	543	219	−39	
Development Bank of Japan	910	200	132	52	−9	
Urban Development Corporation	895	50	1,118	77	636	Abolish
Metropolitan Expressway Public Corporation	462	30	359	45	22	Privatize
Social Welfare and Medical Service Corporation	359	20	61	34	47	Agency
Hanshin Expressway Public Corporation	358	20	259	17	47	Privatize
Japan Scholarship Foundation	222	56	119	113	79	Agency
Agriculture, Forestry and Fisheries Finance Corporation of Japan	208	22	413	87	72	
The Okinawa Development Finance Corporation	187	10	12	7	7	
Honshu-Shikoku Bridge Authority	104	0	661	233	141	Privatize

Note. 1. Planned new issue. 2. Subsidy costs are the present discounted value of subsidies that are attributed to the existing activities of the FILP agencies. See Section 2.1(3). 3. Subsidies from the national government budget. 4. Explicit subsidies from the national and local governments plus implicit subsidies (opportunity cost of investment of governments) minus operating surplus. Numbers are for FY 2000. 5. Reform Plan of Special Public Corporations (December 2001). Reforms of government financial institutions are pending.

Source: Iwamoto 2002

6.8 Trigger for Privatization and the Eventual Reorganization of Japan Highway Public Corporation

The JHPC developed a highway network, financed using FILP and user charges that worked in a favorable economic environment of rapid economic growth, until the mid 1980s. After which the revision of the National Development Arterial Expressway Construction Law in 1987, began to trigger inefficiency, welfare loss and a huge debt. This was essentially due to the fact that newly planned routes of 3,920 km had high

construction costs while there was an inadequate traffic volume to recover spending (Kimura & Maeda, 2005, p. 9). With insufficient funds and with small government subsidies, the toll fees were revised twice in 1989 and in 1994, and the redemption principle was reorganized so as to make planned redemption period longer, that is 30 years to 40 years. In 2000, the redemption period was again extended to 45 years and then 50 years. The late 1980s was also a turning point in terms of government fiscal expenditure; with annual investment in the highway construction by the JHPC passed a million yen in FY1989. Public expenditure and construction investment was kept high since the early 1990s to late 2000s due to political pressure from the United States and later to counter recession, accumulating a large outstanding debt (Kimura and Maeda 2005, 9). To exacerbate the situation, the recession also stalled the growth of traffic using the expressways since the latter half of the 1990s, bringing toll revenues much below the forecasted figures.

All these issues aggravated the financial strain on the JHPC, which became the center of controversy as the highway was designated for privatization in December 2001, when the "Reorganization and Reform Plan of Special Public Corporations" was approved at the Cabinet meeting of Prime Minister Koizumi. The conjecture was that if any public service could be provided by the private sector it should be contracted out to the private sector so as to improve efficiency and turn around the losses. More specifically the Prime Minister's established the Committee for Promoting Privatization of Four Highway-related Public Corporations that were in charge of the construction and management of highways in Japan: Japan Highway Public Corporation (1956), Metropolitan Expressway Public Corporation (1959), Hanshin Expressway Public Corporation (1962), and the Honshu-Shikoku Bridge Authority (1970). The committee addressed many issues, starting from managing the huge accumulated debt, the never ceasing highway construction plans, the expensive toll rates, the regional imbalance of highways (inadequate in large cities and unused in rural areas), the inefficient management of public corporation, the extra costs due to the corporation's family companies, and political intervention in highway construction (Mizutani & Uranishi, 2006, p. 14).

A year later in December 2002, the committee's final opinion report, recommended an organizational reform based on a vertical unbundling principle where highway service companies would provide services to an infrastructure holding organization. The committee's recommendation became the basic plan for the privatization of four highway-related public corporations, during joint meeting of government and ruling parties; and Privatization Bill was passed in the Diet in June 2004, as a law providing for:

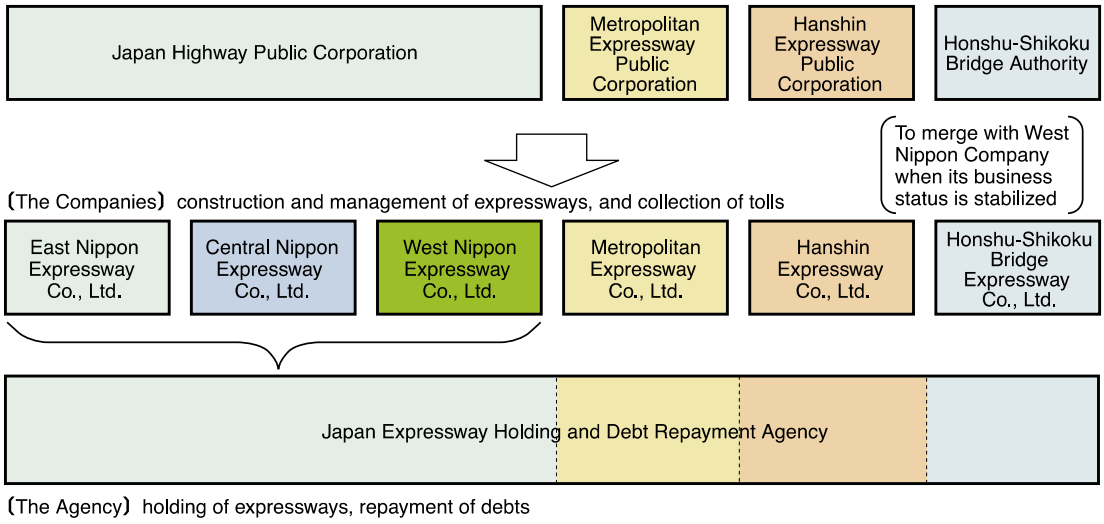
(i) Six specific joint-stock highway corporations that are 1/3 government owned (permission required for their appointments of presidents, their business plans, and so on). These corporations would have the power to veto highway construction, although a Panel on Infrastructure Development would make the final decision.

(ii) One independent administrative agency serving as an asset-holding and debt-servicing organization established

The privatization of the four highway public corporations was also based on the experiences from the privatization of the Japan National Railway in 1987. The most important characteristics of the organizational reforms of the four expressway public corporations it was ensured that there was a regional horizontal unbundling and vertical unbundling of services. Apart from the unbundling activities, the government sought to be involved in the six joint-stock highway corporations, and its degree of intervention was to be comparable to that of NTT and stronger than that for JR. The level of managerial autonomy of the corporations was assumed to be largely dependent on the details of agreements with the umbrella organization.

Until October 2005, Toll roads in Japan were almost entirely constructed and operated by public corporations, which include the JHPC, Metropolitan Expressway Public Corporation, Hanshin Expressway Public Corporation, Honshu-Shikoku Bridge Authority, and some other local corporations. But ever since, they were privatized, to form six expressway companies (East Japan Highway Company (EJHPCC), Central Japan Highway Company (CJHPCC), West Japan Highway Company (WJHPCC), Metropolitan Expressway Company (MEC), Hanshin Expressway Company (HEC), and Honshu-Shikoku Highway Company (HSHC)) and an independent administrative entity the Japan Expressway Holding and Debt Repayment Organization (JEHDRO) was established (refer to Figure 6-3 to observe the organizational chart).

Figure 6.6 Organizational Chart of Privatization of Four Highway-Related Public Corporations



Source: http: //www.jehdra.go.jp (2007)

Figure 6.7 Reorganized Highway Network in Japan

Note: This picture was made by the authors based on each company's highway network. Solid lines are operating routes. Wavy lines are planned routes.
Source: Mizutani and Uranishi 2008

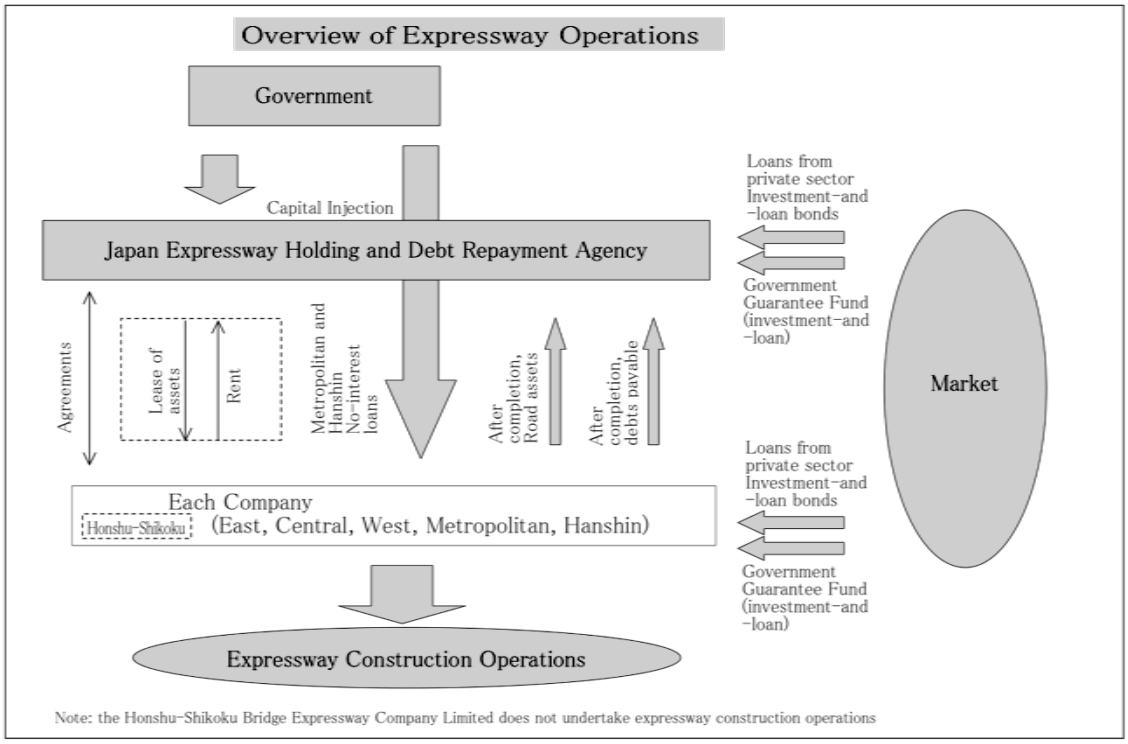
The other three highway public corporations were also privatized without subdivision:

(i) Metropolitan Expressway Public Corporation ⇒ Metropolitan Expressway Company Ltd. - provides services in the Tokyo metropolitan area
(ii) Hanshin Expressway Public Corporation ⇒ Hanshin Expressway Company Ltd. – provides services in the Osaka metropolitan area
(iii) Honshu-Shikoku Bridge Authority ⇒ Honshu-Shikoku Bridge Express Company Ltd. - was planned to be merged to West Nippon Expressway Company after the Honshu-Shikoku Company stabilizes its operation and management.

The new role of the six regionally separated expressway companies is in providing administration and maintenance of express the express highways and service areas after renting it out from the Japan Expressway Holding and Debt

Repayment Agency. Apart form the horizontal unbundling of the Highways there was also a vertical separation between the highway service provider and the infrastructure holding organization (refer to Figure 6.8). In order to effectively privatize the four public highway corporations the Japan Expressway Holding and Debt Repayment (JEHDR) Agency as mentioned above was created; this agency essentially holds highway facilities and leases it to the expressway companies. The JEHDR Agency is a public organization that not only holds the highway assets of the highway-related public corporations but it is also responsible for repaying the debts of the former public corporations by collecting highway fees from six companies. The JEHDR was setup in a way that once the repayment was completed in the planned 45 years, the JEHDR Agency would be dissolved and cease to exist.

Figure 6.8 The Vertical Re-organization - JEHDR Agency with Service Providing Companies



Source: http://www.mof.go.jp/zaito/

Japan Expressway Holding and Debt Repayment Agency aims to reduce the public financial burden related to expressway and assist smooth operations related to expressways by the expressway companies through efforts including speedy and sure repayment of debts inherited from the four former Japan Highway Public Corporations as well as the ones related to such operations as new construction and reconstruction of other expressways, other than the holding of expressway assets and lending for expressway corporations. East, Central, and West Nippon Expressway Company Limited undertake new construction, reconstruction, maintenance, repair and other management of expressways. The FILP peaked in 1996 at 40.5 trillion yen and ever since 2001, when the reforms were induced it now hovers around 15 trillion yen. The total Outstanding Amount to the Fiscal Loan fund within the FILP Plan peaked in 2000 at 417.8 trillion yen.

Table 6.10 Expressway Type and Length in Japan (as of FY2007 end)

Type of National Expressways	Target Opened to Traffic	(as of end FY2007)
National Expressways:	8,520 km	7,531 km
Ordinary Toll roads:	1,077 km	921 km
Metropolitan Expressways:	323 km	294 km
Hanshin Expressways:	264 km	239 km
Honshu-Shikoku Bridge Expressways:	173 km	173 km

6.9 Issues with the Privatization

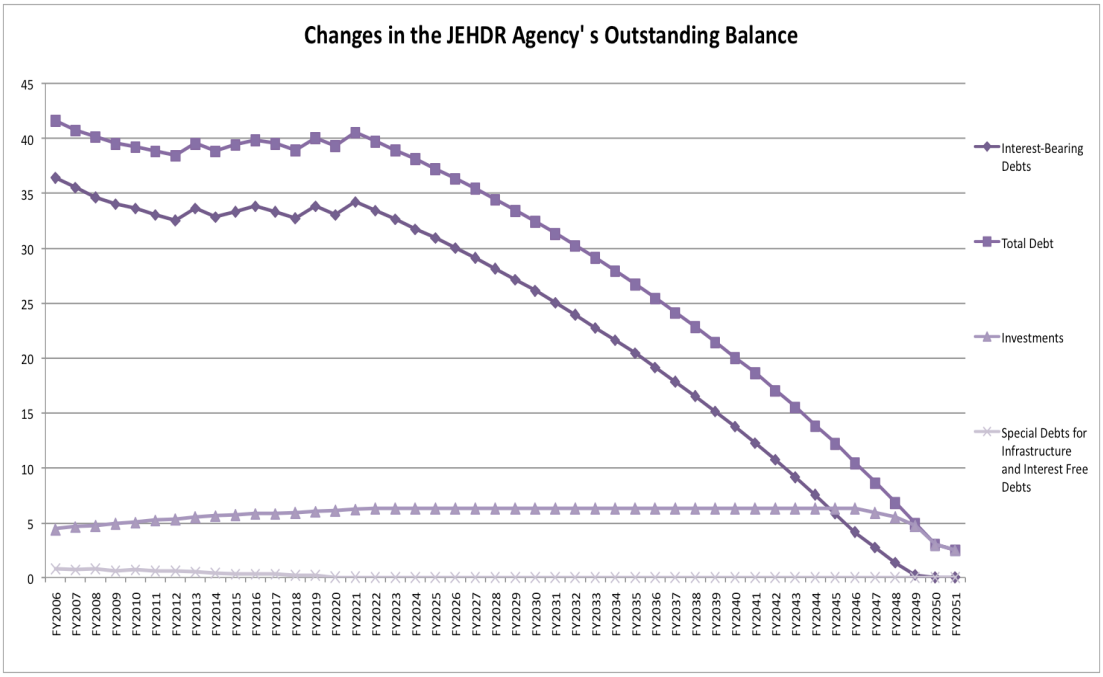
While according to the Ministry of Land, Infrastructure and Transport (2005, cited in Mizutani and Uranishi 2006, 14), the three main purposes for the privatization of the four highway public corporations were:

i. To secure repayment of interest-bearing debts, that amounted to about 40 trillion yen
ii. To construct economically viable expressways without increasing the burden on the general public, while allowing companies to operate autonomously
iii. To offer flexible prices and rates of services by utilizing the private sector's know-how.

The changes in the outstanding debt and balance is shown below in Figure 6.9, as it can be observed, the total debt is and investment borrowing are to be brought down to zero in the next 40 years. After holding a peak of over 41.6 trillion, this figure is to be brought down under the new managements system of JEHDR. The main component of the total debt is interest bearing-debts, so it is very likely that interest payment is itself quite a substantial part of repayment. These projections are also based on many assumptions including: economic growth rates of 1.6% in 2006 ~ 1.9% in 2010 and 1.5% in 2011 ~ 0.4% in 2050 (according to MITI calculations), fundraising costs in the future of 4% (after FY 2009) a medium vehicular traffic estimate of:

Item/Year	2003 (actual figure)	2020 (estimate)	2050 (estimate)
Total distance traveled by all vehicles (in billion kilometers)	793	868	801

Figure 6.9 Changes in the JEHDRA'S Outstanding Balance



Graph created by Author - Source: http: //www.jehdra.go.jp (2007)

Figure 6.10 Possession of Debt and Loan of Highway Assets as of 1st April 2006

[Unit : ¥ billion]

Classification		Balance at the beginning of term	Increase during the term	Decrease during the term	balance at the end of term
Long-term debt	Debt from government (interest bearing)	8,751.906	50.875	96.797	8,705.983
	Debt from government (interest free)	741.859	0	47.552	694.307
	Debt from private sector	2,846.557	89.345	769.913	2,165.988
	Total of long term debt	12,340.323	140.220	914.263	11,566.279
Bonds	Government-undertaken bonds	13,324.201	0	2,339.760	10,984.441
	Government-guaranteed bonds	6,697.299	2,190.000	309.866	8,577.433
	FILP agency bonds	2,628.100	530.000	50.000	3,108.100
	Private bonds	1,678.507	0	337.967	1,340.539
	Total of bonds	24,328.107	2,720.000	3,037.593	24,010.513
Long-term account payable	Long-term account payable relating to the construction of Tokyo Wan Aqua-Line	617.380	0	81.672	535.708
Total of debt		37,285.811	2,860.220	4,033.528	36,112.502
(Of which interest bearing debts)		-36,543.952	-2,860.220	-3,985.976	-35,418.195
Capital		4,463.874	132.700	0	4,596.574
Total of debts and capital		41,749.685	2,992.920	4,033.528	40,709.076

Note) All of the long-term debts which increased during the term are the debt transferred from Highway Companies together with highway assets.
Note) There may be a discrepancy in the figure of total because of the processing of fractions.

Source: Source: http: //www.jehdra.go.jp (2007)

Unbundling and privatization of Infrastructure services through vertical and/or horizontal separation has become a common policy in many public utility industries, among developed and developing countries especially since the 1980s. Vertical separation in highways however makes it easier to:

1. Promote a variety of service providing companies that operate under governmental franchised markets,
2. Clarify intra-industry relationships
3. Using specialized service providing companies that improve efficiency, and promote specialized activities.

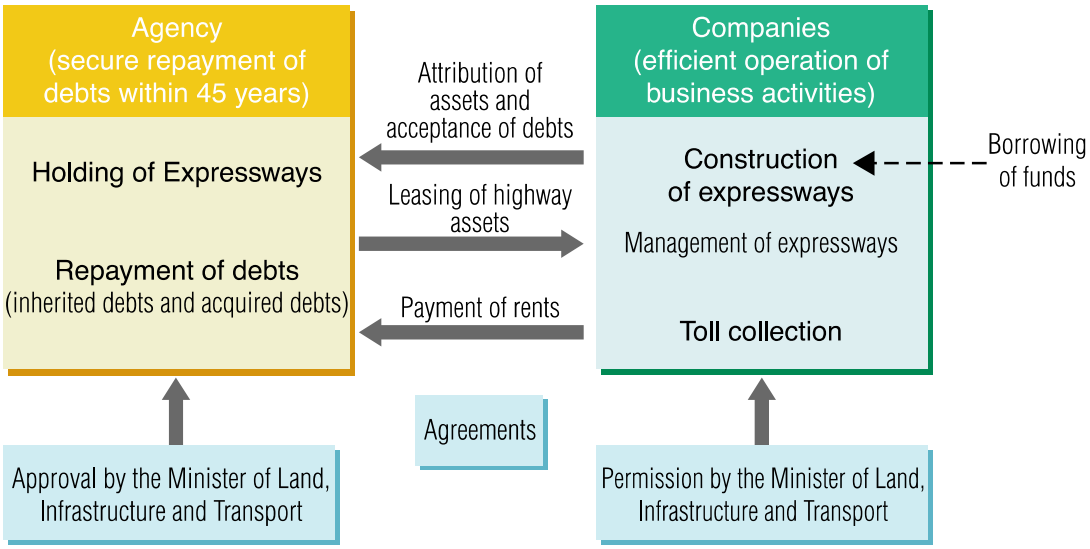
Conversely, vertical separation makes it difficult to:

1. Calculate and set up fair prices and monitor performance at all the levels,
2. Negotiate arrangements between two organizations and to ensure the combined objective of providing equitable and efficient infrastructure services.
3. Transaction costs of coordinating efforts at the various vertical levels.

But the biggest advantage of vertical separation, especially in reference to JHPC was that the newly established highway service providing companies were delinked from the financial burden (JHPC debt). What happened to JHPC was also believed to be the result of the lessons learnt in the privatization of Japan National Railways (JNR) was divided into 6 regional companies and Japan Freight Railway Company in 1987. Also in the case of the newly established highway providing companies, have a role in constructing their own highways. This will not allow for specialization, and to true vertical separation would demand for the construction of highways to be taken care of by a different firm or the infrastructure holding organization (Mizutani & Uranishi, 2008, p. 489). Another difficulty is the decision making process and the high transaction costs in setting toll levels, infrastructure charges, construction of highways, and profit levels, as negotiations happen between highway providing companies and the infrastructure organization. Something that remains unchanged is that even after an agreement of both organizations is reached it needs to be approved by the Ministry of Land, Infrastructure and Transport. But as in fact each independent expressway company is actually a regional monopoly, the traditional regulation method there remains few incentives for expressway companies improve their performance.

According to the JEHDR Agency (p. 488) there are two incentive schemes for expressway companies to benefit, out of gaining efficiency in construction and repair, and the other through improved management of highways. In regards to reaching efficiency in construction, the JEHDR Agency sets standard costs for construction and repair and if expressway companies keep costs below the standard, then half the difference between actual costs and standard costs is rewarded as a subsidy. The second scheme, in terms of rewarding management efficiency, the JEHDR Agency calculates toll charge as the difference between the expected toll charge revenues and the expected administration costs of expressway companies. Therefore by reducing real administration costs below the expected administration costs, the expressway companies can make profits with the increased real toll revenues. On the contrary, if the opposite happens then the companies will incur loss, in order to avoid this situation the expected toll revenues and the expected administration for each year are shown in advance. So that this data can be used as targets to attain efficiency in management, but again, in case there is continuous profits or continuous loss, the JEHDR will reset the infrastructure charges.

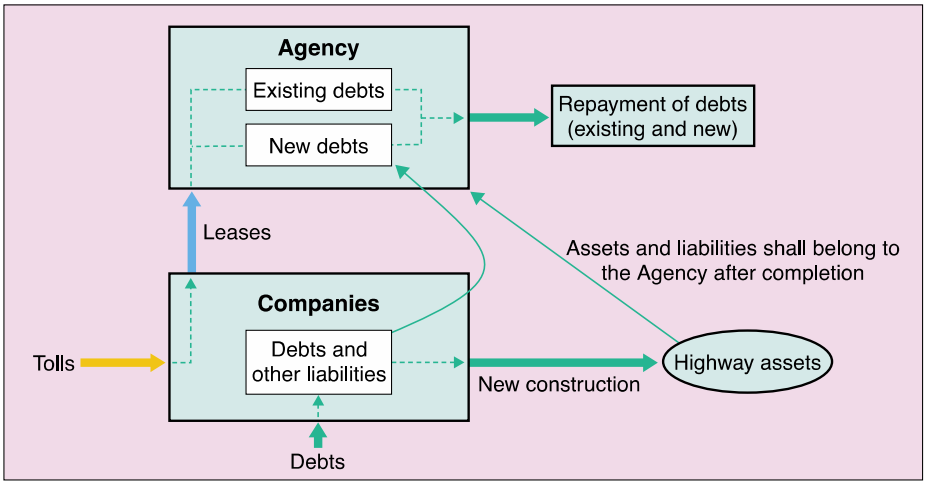
Figure 6.11 Framework for Implementation of Expressway Business by the Agency and the Companies



Source: http: //www.jehdra.go.jp (2007)

Although all the efforts in unbundling and privatization of the highways has been to improve efficiency, it is yet unclear as to how toll charges can be reduced. The privatization plan of the government is primarily driven on reducing debt and debt repayment, and to increase efficiency (and reducing cost) by introducing private company's management practices and their advanced technology deployment such as the Electronic Toll Collection (ETC) system. Although the increase of ETC can reduce labor, the decrease in cost might not be enough. As long as there are the remnants of the post-war system, in terms of repayment principle and the pooling system of toll revenues, it has been observed that the tolls can no longer be reduced. As Mizutani and Uranishi suggest (2006) the two possible ideas for reform would be the use of gasoline taxes (which is already high) for the construction of highways or to, instead of making toll-free highways after 45 years just leaving them as toll-roads forever and reducing the tolls charges.

Figure 6.12 Highway Assets Debt Flow



Source: http: //www.jehdra.go.jp (2007)

6.10 Organization of Road Development and Its Financing

Just to explain the differentiation of Highway and road development in Japan, this section will seek to describe the way in which they are developed, administered and financed. All other regular roads other than highways are generally constructed and maintained with auto-related taxes such as the gasoline tax and the 'auto acquisition tax' (a kind of luxury sales tax at 10%, cited in Japan Automobile Manufacturers Association, Inc. website). The revenues from these taxes are distributed to the national government and local governments for the improvement of regular roads, of which the construction and maintenance are administrated by the Ministry of Land, Infrastructure and Transport, prefectures, cities and so on, respectively. The type of administrative body responsible depends upon the type of road and the level they are being handled (refer to Table 6.11). On the other hand, highways as earlier sections explained were constructed and maintained mainly by toll revenues and government subsidies through the JHPC. The general feature of the pricing structure of Japanese highways was that a pooling system of toll revenues is used.

Table 6.11 Administration Body and Bearer of Expenses for each Type of Road

Kinds of road	Construction	Maintenance	Bearer of expenses
Highway	Highway Public Corporation	Highway Public Corporation	Highway Public Corporation, National government
National road (special route)	Ministry of Land, Infrastructure and Transport	Ministry of Land, Infrastructure and Transport	National government prefecture
National road (non-special route)	Ministry of Land, Infrastructure and Transport	Prefecture or ordinance-designated city	Prefecture or ordinance-designated city
Prefectural road	Prefecture or ordinance-designated city	Prefecture or ordinance-designated city	Prefecture or ordinance-designated city
Municipal road	City, town, village	City, town, village	City, town, village

Note:
(1) This table was devised by the authors based on the following information in Imahashi and Takeda (1992, p. 216) and Ministry of Land, Infrastructure and Transport (2006, p. 6).
(2) An ordinance-designated city in Japan is a city which has legal power equivalent to that of a prefecture. There are 17 such cities, including Osaka, Nagoya and Yokohama, as of 1 August 2007.
(3) This table conveys the before-privatization situation of four highway public corporations.

Source: Mizutani and Uranishi 2008

In order to build and maintain the other roads, the Japanese national and local governments receive more than 10% of their entire revenue from nine automobile related taxes. These include sales, property and fuel taxes, which have also risen over the years leaving Japanese consumers little understanding of the logic or purpose of the system. A significantly simplified outline of this complicated auto tax system follows:

i. The Japanese who purchases a new car pays a 5% "acquisition tax" (a kind of luxury sales tax) on the base price of the vehicle at the time of purchase. This tax originated in 1968 when cars for personal use were still considered a luxury. That tax instead of becoming abolished as more cars were being bought actually increased to 10% since 1997.

ii. In addition to regular inspection fees, the Japanese car owner pays an annual vehicle property tax, ranging from between US$250 and US$900 depending on engine size. On top of this, owners pay an annual weight tax amounting to about US$105 on a one-ton vehicle. These taxes are supposed to cover road building and road maintenance costs, but the budget process offers little explanation as to their actual use.

iii. Then there are high fuel taxes totaling about US$1.69 per gallon or more than 50% of the gas price (Source: Japan Automobile Manufacturers Association, Inc http://www.jama.org/AutoTrends/detail1d69.html?id=224 accessed June 18th 2010)

As the automobile-taxation system has not changed significantly to match the changes in the market and the vehicle environment. On the one hand, automobiles in Japan, once a luxury for the elite, are now a necessity for most households. Since 1965, where less than 10% of households in Japan owned a car, today almost all households own a car and half of them own two cars (refer to Japan Automobile Manufacturers Association, Inc database website: http://jamaserv.jama.or.jp /newdb/eng/index.html accessed July 23rd 2010). As there is a need for tax rates and incentives to reflect the change, for example it was not until recently that incentives were used to encourage consumers to purchase environmentally friendly vehicles, such as hybrid and fuel cell vehicles.

6.11 Technological Prowess of the Japanese Highway System: The Intelligent Transport System Initiatives

Japan, apart from deploying ETC systems it has been actively involved in the deployment of the Intelligent Transport Systems (ITS) focusing on in-vehicle information systems, with benefits sought in terms of safety and the environment. The history of ITS development is relatively new, the precursor being the 1960s research program in the U.S. called Electronic Route Guidance System (ERGS). But it has been rapidly developing with major projects developed around the world especially since the 1990s. Now there is even a world congress has been held annually since 1994, with the U.S, Europe, and Japan being the drivers of the ITS technology development. ITS as a new transportation system utilizes sophisticated communication and electronics technologies in order to reduce congestion, improve transportation safety ultimately to enhance productivity. Japan has had a similar experience with ITS initiatives as in Europe, but Japan has much more vendors of ITS-related products and services, manufacturing these devices. These devices are manufactured by electronics device manufacturers and sold by them or via automotive manufacturers Vehicle Information and Communication System (VICS).

VICS is a real-time system that provides information through radio traffic reporting services and websites, on weather, road and traffic conditions, and navigation assistance to in-vehicle navigation systems. The system has been considered a great success with more than 9 million subscribers in 2004. This system serves as a catalyst for further ITS deployment in automobiles. Taxi probes equipped with GPS and wiper sensors are used by the Japan Road Traffic Information Center to obtain information about the transportation system; the information is then analyzed and passed along to motorists using VICS. There are also other applications and programs being developed in order to assess information like traffic congestion on planned route, to decide between alternate routes, accident information, to estimate their trip duration and distance, and weather information. With the four primary

benefits being saved time, avoiding and regulating congestion, reducing stress, and avoided unsafe conditions.

In Japan, the Japan Highway Public Corporation installed a mobile radio local-area network with a 2.4 GHz bandwidth to communicate both data and images to in-vehicle navigation systems (Nakanishi, 2009, p. 1170). Eventually the free Advanced Traveler Information Systems (ATIS/V) for vehicles evolved, supported by the public sector providing traffic data using three media channels: radio wave beacon, infrared signals, and FM multiplex broadcasting to vehicles using the VICS. The ATIS being based on the VICS service started in 1996 in the Tokyo area and covered the entire nation by 2003. This onboard navigation service was universally accessible and free, the only condition being that the users had to pay a one-time setup fee for installation of a VICS compatible on-board devices (includes price of device and royalty).

ATIS/V sought to deliver data that was collected (through VICS) directly to the travelers in real-time, empowering them to make better choices about routes and modes of transportation, in order to increase safety, time savings, and stress free. When archived, this historical data provides a mine of information to transportation planners with accurate travel pattern information, optimizing the transportation planning process (Intelligent Transportation Society of America, cited in Sugawara 2007, 13). ATIS provides travelers with traffic and transit conditions, presenting multimodal options at the right time to improve the quality and convenience of their trip and the overall performance of the transportation system. In Japan, 20% and 30% of vehicles with VICS system were expected to reduce traffic congestion by 10% in the Tokyo metropolitan area and 6% in Japan, respectively (Sugawara, 2007, p. 16). ITS is expected to be a solution to problems caused by transportation such as congestion, accidents, economic analysis and environmental emissions and to be a strong incentive to encourage economic growth.

6.12 The Financial Aspect and Policy Implications of the Japan Highway Public Corporation Privatization

In 1999 one World Bank Study summed up Japan's transport system as complex but advanced system of road and rail networks totaling more than 1 million kilometers and 23.000 kilometers, respectively. The total road length includes about 12.000 kilometers of high-standard trunk roads (mostly toll roads), and more than 700 kilometers of tolled urban expressways. The country's rail system includes extensive urban commuter railways, as well as a 2000 kilometers network of high-speed *Shinkansen* (bullet train) network. The highway system as of 1995, while competing with the railway network to transport customers, handles about 66% of all passenger trips in terms of passenger-kilometers and 53% of all land-based freight traffic in terms of ton-kilometers (Imamura, 2002, p. 138). As this study illuminates the rapid pace in which the highway network developed in Japan, it did not heavily depend on government subsidies but primarily relied on its own operating revenues through toll collection.

To address the government's perceived need to rapidly develop a necessitated national road network, in 1952 the government revised the Road Law (*Doroho*), which was the main regulation for road policy, and set up a system for constructing the highway network. Furthermore, the national government enacted new laws such as the Road Improvement Special Law (*Doro Seibi Tokubetsu Sochiho*) and the Special Road Improvement Accounting Law (*Tokutei Doro Seibi Jigyo Tokubetsu Kaikeho*) in order to borrow money from postal savings because the national government's general account was insufficient to finance construction of a road network. The enactment of these laws saw a shift in road policy from the traditional view that roads should be free, to the idea that tolls should be imposed to support the maintenance and expansion of

the road network (Mizutani & Uranishi, 2006, p. 1). Between 1952 and 1956, highways as portions of a toll road system were constructed in 8 places by the national government and in 27 places by local governments.

Such activity spurred further construction, but progress was not without problems, such as difficulties among governments in coordinating administration as well as in financing the highways. This led to a need for a central organization, which would systematically construct a highway network. As a result, the Japan Highway Public Corporation Law (*Nihon Doro Kodanho*) was approved in March 1956, and the Japan Highway Public Corporation was established a month later. With the three alternatives of management and operation for the JHPC ranging from

(i) An entirely public corporation (*Kosha*), these firms run as a corporation on market principles, with typical examples including the former Japan National Railways (now the JR companies) and the Nippon Telephone and Telegram (now NTT).

(ii) A special company (*Tokushu Kaisya*), is a joint stock company type invested in by the government, where it is more commercial oriented but there is a public purpose. An example of this type is Electric Power Development Company.

(iii) And finally the non-commercialized public corporation (*Kodan*), while the non-commercialized public corporation has a more public purpose, the organization is separated from the governmental body in order to acquire managerial independence or financial self-support. Japan Housing and Urban Development Corporation is an example of this type.

The Japan Highway Public Corporation, a special corporation with 100% national government investment, was established as a non-commercialized public corporation as there were uncertainties as to what managerial role the government should play. Eventually the Diet deciding on the plan and construction of a highway network decided for more governmental intervention, deciding on a non-commercialized public corporation with a condition that it would be financially self-supporting and eventually using private investment too.

Part of the past success in the transformation of the Japanese economy has also been the highly effective central government organization in promoting planning studies and ensuring the implementation of projects. Another important lesson from the lost legend of the JHPC was that it complemented the overall economic situation during the high growth period the explosive expansion of traffic strongly supported the toll pooling system and the redemption principle with certain level of discipline. At the same time the growing demand and appetite for production of motorized vehicles at home and mass export would have brought over confidence to the planners in developing extravagant projects without really being able to forecast accurately. However, in the period of low growth in the maturing economy, the financial structure should have ideally been reorganized, reforming the basic function of organizations such as JHPC from construction to operation and maintenance. But it also needs to be kept in mind that the peak of JHPC operations started in the latter half of the 1950s and early1960s, way before the era of privatization, PFI, PPP, and others, and thus it may be difficult to draw lessons directly in terms of applicability developing economies now. Nonetheless, objective assessment of its performance does provide valuable insights.

Ever since 1956 when the Japan Highway Public Corporation was instituted it remained crucial in expediting construction of a nation-wide expressway network, until October 2005 when it was privatized and separated into three expressway companies. The system was built intending tolls to be scrapped and highway services offered for free once the construction debts could be repaid. Although expressway tolls were collected respective to their individual routes, once the decision was made to pool them

in within the same budget and use it for the construction of other routes, although it was based on the concept of equity in the longer run it could not sustain itself. The JHPC and the other three other public corporations were privatized as well to form the six highways related companies that were became delinked from the extensive debts the JHPC had accumulated. Although the government still had held 1/3 shares of these companies, they were expected to bring efficiency, cost-saving, and profitability back into the management of highways, in order to repay the debts of national highways over the next 45 years, that already reached a prodigious 40 trillion yen.

Table 6.12 Chronology of Japanese Highway Development Legislations and Regulatory Bodies

Year	Legislation / Development
1956	Japan Highway Public Corporation Law enacted, established to manage the construction of pay-per-use roads.
1957	National Development Longitudinal Expressway Construction Law – National Expressway Law Enacted
1959	Metropolitan Expressway Public Corporation Law enacted
1962	Hanshin Expressway Public Corporation Law enacted
1963	Meishin Expressway was the first to open, in 1963, running 71 km between Ritto, Shiga Prefecture, and Amagasaki, Hyogo Prefecture.
1966	The National Development Longitudinal Expressway Construction Law was revised to incorporate plans for a 7,600-km nationwide network
1970	Honshu-Shikoku Bridge Authority Law enacted Establishment of corporations started in the same year. Up to present, 42 corporations have been established.
1972	Nationwide toll pool system implemented instead of redemption of individual roads, and tolls would be pooled from all expressways to provide a single source of operating funds.
1987	National Development Arterial Expressway Construction Law revised, and Japanese government approved expanding the network to 11,520 km
2003	Law Concerning Urgent Special Measures to be taken in FY2003 to Reduce the Debt Burden of the Honshu-Shikoku Bridge Authority enacted Law Concerning Partial Revision of the National Expressway Law and the Special Measure Law for Development of Okinawa enacted
2004	Four laws concerning the privatization of the four major highway construction corporations enacted
2005	Six expressway companies and Japan Expressway Holding and Debt Repayment Organization established JHPC was privatized and spun off into West Nippon Expressway Co., East Nippon Expressway Co. and Central Nippon Expressway Co. as part of reforms spearheaded by Prime Minister Junichiro Koizumi. As public-run entities, the four predecessor firms had rung up about ¥40 trillion in debt through never-ending road construction projects. The Koizumi administration sought to end such excesses. JHPC privatized, the privatization law required the firm to pay off all its debts within 45 years.

Source: Compiled by the Author, from relevant websites; JEHDR, Ministry of Land Infrastructure, Transport and Tourism, Ministry of Finance, Japan Times

The financing success of the JHPC could also be attributed to the macroeconomic conditions that existed in postwar Japan and the successful intermediation of the FILP in funding public corporations. These conditions ranged from the high savings rate in the household sector and private sector, the ubiquity of post offices (24,574 branches of Japan Post as of the end of fiscal 2006) and products of postal savings assets, independent setting of interest rates, and the effective intermediation through the FILP into government spending (although there was no bond, securities, pension and insurance markets). Another important aspect of the effective financing included the absence of a huge deficit in the government budget; in fact on the contrary Japan had healthy government finances from the 1950s to 1970s.

According to Kaneko and Metoki (2008) the policy lessons where a fiscal policy method that are similar to Japan's postal savings system and FILP could contribute to the national development in other countries:

(i) The first and most important condition is the high saving rate in the private sector. The FILP before 2001 was not a system for creating savings but a system of channeling them.

(ii) Secondly, an appropriate network infrastructure is indispensable to collect deposits from the ordinary citizens; financial inclusion

(iii) Government deficits should be small enough not to absorb the private savings to finance the deficits. Or fiscal discipline is to be kept in a way that strictly separating the general account budget and the special account budget of accumulating the people's savings and investing in appropriate programs for national developments.

With 2001 being the watershed year in terms of bringing the Post war system into shambles, as the both the FILP and JHPC were brought to terms as they were going to scrapped and privatized respectively. It remains unclear as to how Japan would move from a system of mass, rapid financing and development of infrastructure services to improving efficiency, maintaining demand and paying back debts.

6.13 Conclusion

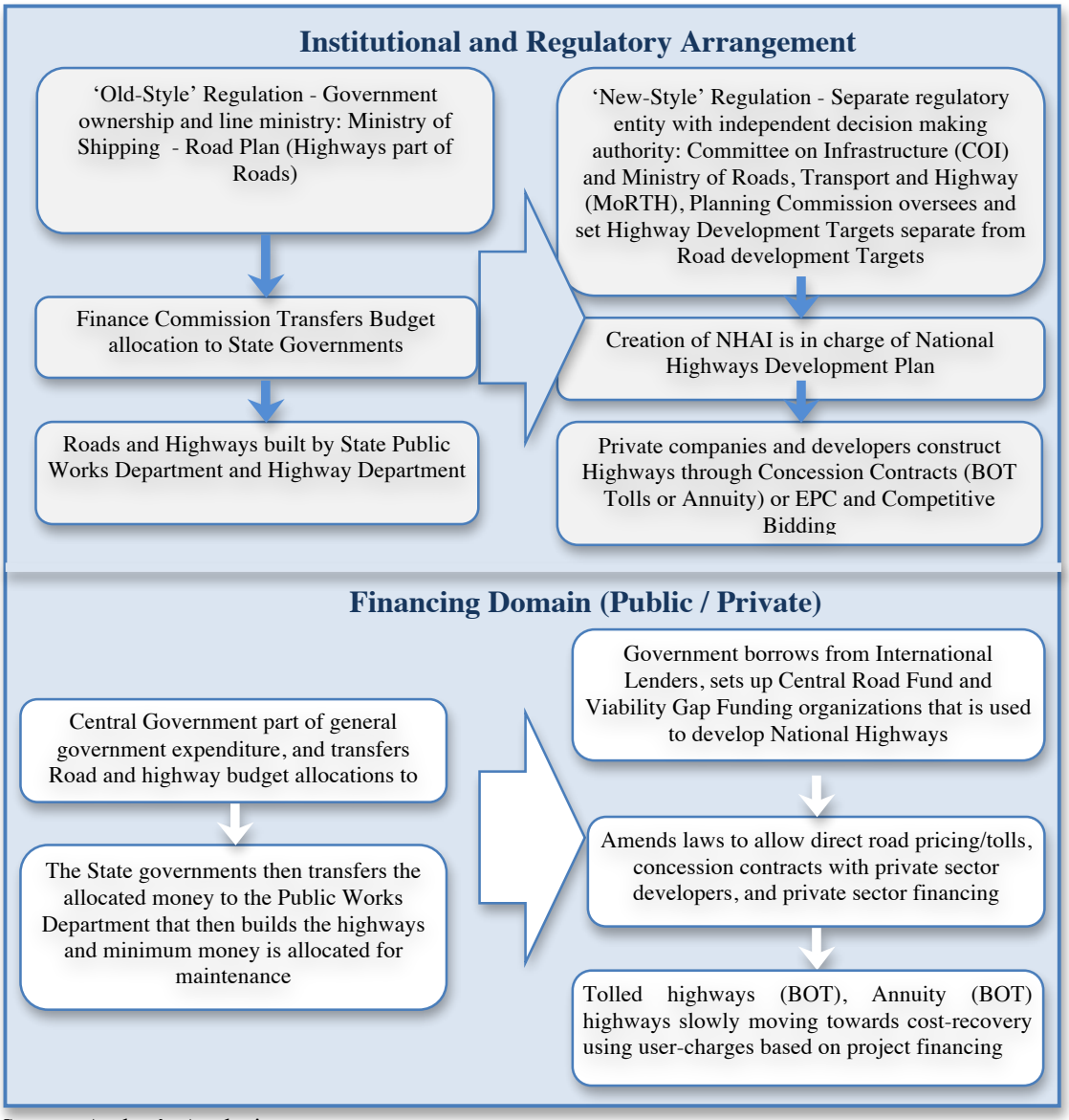
The Japanese experience with highway development and financing is used as a case study as it assists in drawing invaluable lessons in public financing and evidence-based policymaking (EBP). Japan had rapidly developed its network of highways and expressways through a public corporation - Japan Highway Public Corporation (JHPC), and using tolls and public finance (including FILP). In the 20 years from the mid 1960's, the network was expanded based on highway development legislations, principles of equal access, various forms of cross subsidization (including spatial and temporal), cost-recovery through user-charges, and toll pooling. These various principles, although they allowed for the rapid development of equitably accessible highway network, ended up with a huge public debt equaling over Yen 40 trillion in 2006. The JHPC was further privatized and horizontally and vertically unbundled, with a main independent debt recovery Agency (Japan Expressway Holding and Debt Repayment Agency – JEHDR) and other management companies that operate on leased assets. The mammoth burden of this Agency and the management companies is to recover the debt accumulated over the last 45 years, over the course of the next 45 years. This experience provides a valuable lesson in efficient public financing and the establishment of effective institutional and legislative arrangements that fulfill the goals of rapid expressway and highway networks. But just developing such public assets is not enough: sustainable use of assets and operating on business management principles and project finance are equally important in avoiding the accumulation of large debts. Analyzing these issues and the principles that led to effective policies and institutions on the one hand, and public finance mismanagement on the other, provides valuable lessons for public choice in effectively providing and financing infrastructure.

7 The Findings of This Dissertation

7.1 Findings from the Indian Infrastructure Development and Financing: National Highway Case Study

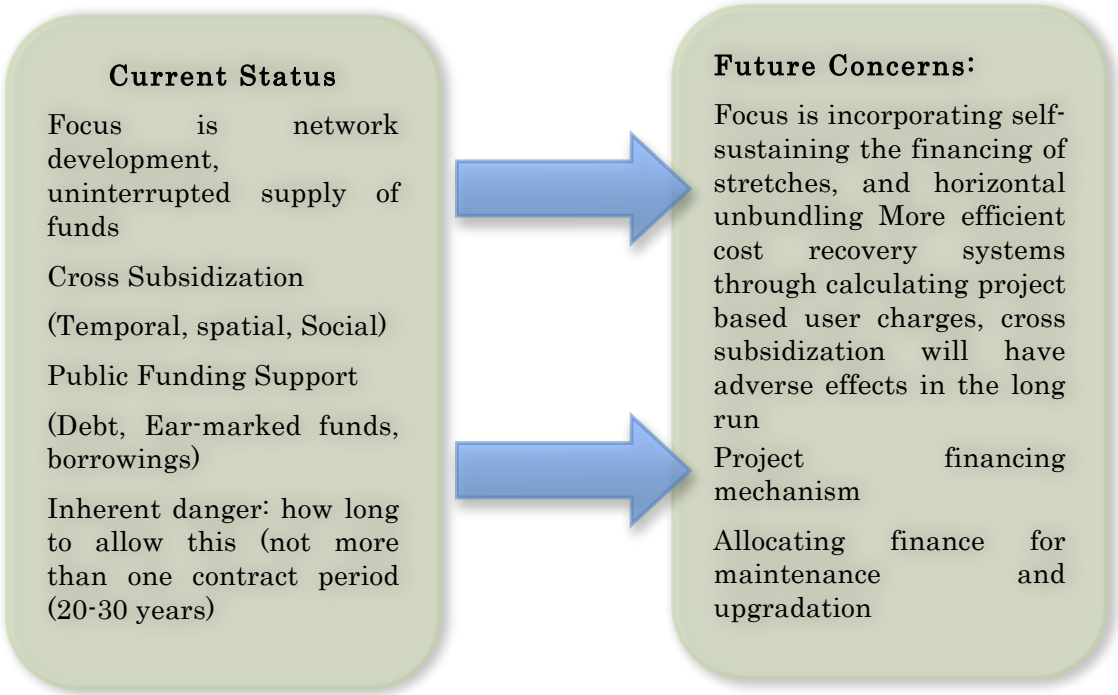
As this study sought to comprehend unbundling infrastructure services when complemented with financial system development, it could allow new opportunities for public-private cooperation in providing more efficient and effective funding infrastructure services that were in the public domain (refer to Figure 7.1) as a summary of results from this research). According to this study the NHAI is still short term oriented, looking ahead at only the next 15-20 years (where debt repayment should complete by 2030 for the seven different phases of NHAI). There is an urgent need to incorporate a principle-oriented development and financing of this crucial infrastructure, whereby in the long term the social and spatial cross-subsidization has to give way to sustainability; and to look at the viability of developing a better cost recovery system through user charges, according to the increase in traffic volume of specific routes. Although the fuel tax/cess revenue is growing, and all the annuity payments would be repayed by 2030, increasing the cess (as the government plans) to finance highways would not be a wise decision considering the fact that there could be a duplicating of charges, as Highway users would be double charged through the oil surcharge and user charge while using the facility. Public Choice also logically points out to growing corruption, where the government (principal) would succumb to economically powerful interest groups (construction companies and lobbies), and not effectively regulate the sector (refer to Figure 7.2 for summary of analysis).

Figure 7.1 Reform in Institutional, Regulatory Arrangements and Public Financing of National Financing of National Highway Financing in India



Source: Author's Analysis

Figure 7.2 The Current Status and Future Concerns of National Highways Financing in India



Source: Author's analysis

The long-term plan would surely need to look at toll receipts, payouts of annuities, and cess. Where India in fact already has one of the lowest costs of transport in the world, increasing tolls would definitely need to be considered over time. Although there were plans to increase toll a few times, considering the thin profits that the trucking sector operates on, they were postponed. There is already a growing discontent (especially in the trucking community) about the duplicity of events as commuters pay cess for road development and on top of that they pay tolls for the section of national highway used. In fact, where many countries turned to private toll roads to generate additional revenues for roads it should be remembered that tolls can only be economically viable and collected on roads carrying relatively high volumes of traffic. As the International Road Federation (1996) suggests, the broad rule of thumb is that, with a 20-year cost-recovery period and a toll of US$0.03 to US$0.06 per vehicle km for light vehicles, there are at least 15,000 vehicles per day (vpd) required to cover all costs. This could also be used to cover rehabilitation, operation and maintenance costs only with 6,500 vpd, maintenance costs only with 3,500 vpd, and toll collection costs only with 1,500 vpd.

The pressure on the road and highway budget is caused by four main factors: (i) government budgets are under increasing pressure from demands by other sectors (education, health and social security being the main contenders); (ii) tax payers are unwilling to tolerate continual increases in tax rates; (iii) maintenance spending can always be deferred with little visible short-term impact; and (iv) road spending – particularly when support for local government roads is included – has become so enormous that it can no longer be fully financed through the government's budget. The above shortage of budgetary resources caused many road agencies to turn towards tolls (Heggie, 1999., p. 91). However, a tolled full-standard expressway link will generally only cover all costs when: (i) traffic volumes are at least 10,000 to 15,000 vehicles per day (vpd) and growing; (ii) average toll rates for private vehicles are $0.03 to $0.06 per km; and (iii) the cost recovery period is 20/30 years (International Road Federation, 1996). At volumes of around 5,000 to 6,000 vpd, revenues will usually cover operation

and maintenance, and may make some contribution to initial construction costs on new roads, or rehabilitation and upgrading costs on existing roads. The balance of the finance has to come from the road budget. Toll roads can therefore play an important role as a mechanism for financing high volume roads, but these roads only account for between 5 and 20 percent of the trunk road network and 1 and 2 percent of the overall road network.

To sum up, although improved utilization of the road budget and introducing tolls – whether through public toll roads or private sector concessions – generates some extra revenues, they will still not eliminate the financing gap in most countries. As the budget revenues allocated for roads plausibly remain much below requirements, the government has to find other ways to obtain the needed funds. Creating the highway network infrastructure, however, is so important that the investments required are also too large to continue being financed through annual budget allocations, compelling countries like India to set up the Central Road Fund that has been used largely for financing highways. This study has sought to outline the alternatives the state has in finding sources to fill the gap in funding. There is an enormous opportunity in shifting Highway financing policy towards a market oriented mechanism, on a user-charges or fee-for-service basis, or allowing specialized public financing institutions, or where the private sector can raise the funds in the financial market to – once the sector develops. As Figure 7.2 suggests the infrastructure unbundling activities, through better regulation coupled with an expanding financial system, provide more opportunities to the public sector in funding the viability gap that exists in infrastructure services requiring heavy investment, such as the highway. The country has still got a long way to go to implement an efficient cost-recovery system through user-charges as that would sometimes require higher toll rates that would in turn be politically sensitive. The financial system also has a long way to go to support the private sector companies that would want to raise long-term funds to finance their short-term construction and highway development projects.

Table 7.1 Provision and Financing Needs of NH Stretches by Nature of Contracts

Market: Private Financing  Public Provision	Contract Type	Nature or Contract	Improving Funding Mechanisms and PSP
	BOT - Toll	Competitively bid Concession Contracts: Private sector raises its own funds to fund the project through equity, debt and VGF. Private Provider recovers cost through tolling (price capped) and returns assets back to the public sector after concession period (20 – 30 years). Concessionaire assumes traffic risks and cost recovery of project. Private Sector (Construction Company raises its own funds through debt/equity mix) VGF of 20%	More quality viability and traffic-growth studies. Eventual setting up of expressways, viable stretches with better quality roads would require project financing, and price caps to become stratified. Large investments with long gestation would necessitate better funding (long term instruments as opposed to financing), through corporate bonds, (setting up bond market and secondary market), mutual funds, and so on, or Infrastructure funding public sector intermediaries.
	BOT - Annuity	Competitively bid Concession Contracts: Private sector constructs and funds projects on the assumption that the public sector repays over prescribed period through annuities. Government assumes traffic risk and only sets standards for service provision. Private Sector (Construction Company raises its own funds through debt/equity mix) VGF of 20%	Improved traffic studies could allow private provision through BOT- Toll Chances for moral hazards as firms will only maintain minimum service standards as they are guaranteed annuity payments. More long-term funds would be required, government could think of longer term Highway bonds, or bonds raised through Infrastructure funding public sector intermediaries. Would also require better regulatory and supervisory control of NHAI to assess risks adequately
	EPC Contracts	Public Sector contracts out EPC using competitive bids and can also contract out O&M for the life of the Highway, but assumes all risks in recovering cost including traffic risks Author assumes that chances of political interference is high in determining stretches	Uses it own funding – author presumes MDB Loans, earmarked / cess funds and recovers cost using toll-charges. Buts still requires justification as to which stretches are to be built and their profitability; though obviously initial network development is justifiable.

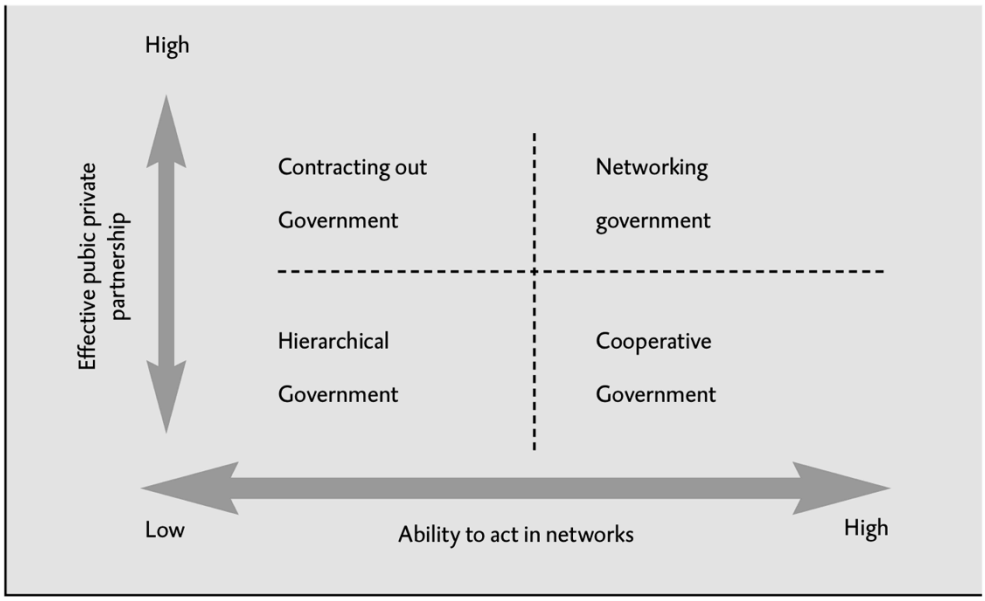
Source: Author's Analysis

The NHAI has only recently come to a position where it now intends to borrow over Rs 40 Billion during this financial year (2010-11) through insurance companies, banks and financial institutions. Recently the NHAI has been able to raise about Rs 25

Billion through Highway Bonds (54 EC tax exemption bonds). This is all because the MoRTH and the NHAI have become more aggressive in hastening Highway development where the plan is to build 35,000km of roads in five years, with an ambitious target of building 20km of road each day. This would require a huge amount of funds and the investments required for the next five years is expected to reach US$ 60 Billion, of which US$ 40 Billion was expected to come from foreign players. This plan is now expected to reach Rs 2 Trillion for financing its various highway projects by March 2031, being financed by both domestic as well as foreign sources, through the PPP model (http://www.thehindu.com/business/Economy/ July 7, 2010, accessed the same day). These are huge investment requirements, compared to what the government receives annually through cess revenues (Rs 80 Billion) and toll revenues (Rs 20 Billion). The World Bank is now suggesting that in annuity projects, the NHAI should offer cash-support of 20-40 per cent of the estimated cost to private road developers during construction period, so that there would be more private sectors able to fund the viability gap, instead of paying the entire amount as fixed annual fees. As Table 7.1 suggests, depending on the nature of the stretch different PPP contracts are being used, but a lot has to be done from the public sector side to promote more private sector participation.

The way forward for governments is to set aside the traditional idea that they are the only ones in charge of infrastructure development and investments. The basic nature of infrastructure to be provided in networks in India, including the National Highways system, requires that the focus is on improving the capacities to act in networks. They are thus faced with a new, more challenging role: as the manager of investment programs of a variety of parties (Teisman, 2008, p. 339). Infrastructure has become part of a large and complex system of elements in which the integration of different road systems, and the subsequent integration of these road systems with other means of transport, has become an important issue. Furthermore, the integration of infrastructure hardware and ICT systems has emerged as an important part of new investment strategies. If this process of multiple systems integration goes ahead, effective infrastructure investments can only be generated by the joint efforts of a variety of parties, not only within the government system but also beyond the boundaries of the public and private domains.

Figure 7.3 Infrastructure Investments on the Edge of Public and Private Domains



Source: Teisman, 2008, p. 339

If investment decisions and operational decisions of any of the parties responsible for parts of the system affect the functioning of the whole system of transport, there is a greater incentive to match and attune decisions to achieve synergy. In this line of thinking a sharp division between public and private domains prevents parties from more effective infrastructure investment strategies. In the private sector joint efforts in network configuration and chains of production are already well developed. Network management and alliance management are normal elements of investment strategies (2008, 336). The performance of one single organization in a network or an inadequate relationship between two organizations in the network or chain can have a significantly negative impact on the output of the network as a whole. Network management entails the spotting of these problem areas and dealing with them. Governing in networks means bringing together and maintaining a set of specific abilities and skills for a long period of time. Dealing with (information) asymmetries in the network and differences in cultures will become an important part of investment program strategies, as is already the case with large multinational companies. There is a growing role of the government to act as a network convener, in order to master the challenges in governing by networks: aligning goals, providing oversight, averting communication melt-down, co-ordinating multiple partners, managing the tensions between competition and collaboration, and overcoming data deficits and capacity shortage (2008, 340).

7.2 Findings from the Comparative Study of National Highway Development and Financing: Japan and India

This research goes further than previous works to build a correlation between infrastructure and the financial system, leading to a shift in public-private domain. First we look at the case in India to provide the normative analysis by outlining the developments in regulations and institutions in the financial system, to lead to better financial intermediation, that is a move from public borrowing, bank based, repressed economy into developing functioning capital markets; and in the future further reforms to develop more long-term funding-oriented instruments (bond market - currently centered on short term government bonds, insurance and pension market development). We review the developments in the infrastructure sectors and arrangements made for financing: ear marked funds; cess/fuel tax; SPV's, such as the India Infrastructure Finance Corporation Limited; private sector financing; regulations; user charges; tolls.

Most of the revenues of JHPC came from tolls, how efficiency was brought the financing structure, based on the principle of recovering cost through user charges. During the arterial network formation, full-repayment principles and price-cap regulations, borrowings from multi-lateral development banks, and later FILP investments, allowed for the steady flow of funds. But the eventual privatization of the JHPC suggests that the change in legislation in the 1980's, allowing for spatial cross-subsidization and pooling of tolls, induced insurmountable debts to accumulate since the late 1980s. The cost structure of the JHPC over the 1990's saw the plummeting of non-road services' costs (that is debt repayment), which led to the eventual privatization of the JHPC in 2005. With the privatization the JEHDR through horizontal unbundling (that is setting up of regional highway management companies) is responsible for the repayment of over 40 trillion yen by 2050. As most of this repayment is interest-bearing, the issue is how these firms will be able to spend on maintenance and replenish aging and technologically aging stock of highway assets, while at the same time making the business profitable.

In Japan most of the funding for the National Highway development initially came from borrowing from the multilateral development banks , and later mostly from

the specialized funding agencies through the FILP (including FILP guaranteed highway bonds) and through user charges. While in India, after the NHAI was set up, financing of the NHDP since the late 1990s came mainly through the cess fund (fuel tax through the Central Road Fund), and initially borrowing from multilateral lending agencies (World Bank, ADBI, JBIC), private sector financing, and to a small extent through tolls (through BOT –Toll and BOT – Annuity projects). Although the future funding mechanism is unclear, major steps have been taken to allow the private sector to participate. But the author proposes that in order to adequately address the supply side constraints, the demand side has to be more precisely assessed through traffic volume analysis and forecasting through vehicle ownership and Origin-Destination surveys. Once demand is recognized and revealed, it would be much easier for the government to garner private sector interest through PPP contracts. Although efforts are being made to provide viability gap funding during the initial investment period, unless the financial system is well developed, the private sector cannot obtain the scale of funds necessary. Corporate bonds, Highway bonds, domestic institutional investors, securitization and similar instruments would be required to sufficiently intermediate the funding requirements of the construction firms. The general development in highway infrastructure regulations is outlined in Japan and India is outlined in Figure 7.4. Although the timing of establishing the highway laws started around the same time in mid-1950s, Japan was very quick in setting up the JHPC and building the expressways. Japan's first major highway was ready by 1963, and consecutively it began to develop its arterial expressway plan and construction. Meanwhile, India was concentrating on developing its 20-year road plans, and whereas roads network expanded tremendously (as they were also part of job-generation programs), highways were ignored. It was not until the late 1980s that India started taking up developing its arterial highway network seriously, by setting up a highway development and regulatory authority. It took another 10 years, after many studies proved that building an expansive highway network was urgent, and in order to provide steady flow of funds the Central Road Fund was set up in 2000.

While over the last 50 years Japan rapidly and successfully expanded its highway development, the Indian NHDP is still yet to reach peak investment and completion of the different phases. The main issues as in Japan would be issues of cross-subsidization through price-cap regulations and toll-pooling, and over-reliance on the ever-expanding fuel taxes. These funding mechanisms and principles could eventually also allow for debts to become part of the system, through over-investment in assets, and demand forecasting errors in another 15 to 20 years. This analysis exhibits a similar pattern in the phases of national highway development between Japan and India, as depicted in Figure 7.5. The process began with the initial vertical unbundling of highway infrastructure services for network formation, through setting up of a highway public corporation (as in Japan) or highway authority (as in India), and guaranteeing a steady flow of funds through specialized funding agencies such as FILP in Japan and CRF in India. This initial regulations period, ranging between 5-10 years, was followed by the actual development of the highways that took around 30 years. In this regard, Japan served as a good case study as it is in its post-development phase, where its experience provides evidence as to what principles are applicable in the short run and others that present inherent dangers in the long run. As Japan's case suggests, universal access to public provision of services of general interest and the nationwide uniform fare was also responsible for the widening and unequal cost burdens, since it did not reflect the regional cost difference. With India still in its early phase of highway development that is to completed by 2030, given the time available there are a lot of adjustments to be made to achieve more allocative efficiency and financial independence in order to allow for a shift in the public-private domain in highway infrastructure financing.

This research suggests that once vertical unbundling takes place and the network infrastructure service is developed, inefficiency and cross-subsidization

eventually necessitates horizontal unbundling. This was the case in Japan earlier with Japan National Railways in 1987, and it was not until 2005 that the JHPC was privatized. The privatization of the highway public corporation led to the creation of a debt repayment agency and six regional management companies. With the previous experience of dealing with the national railways, the government saw that the geographical division and creation of regional management companies was best suited to manage the regional distribution of demand. Although it has only been five years since privatization, the author presumes that elements of yardstick competition are being introduced. Under these circumstances the goal is to engage the regional companies to achieve profitability by competing with each other, and eventually contribute to the repayment of debts. As eventually horizontal unbundling becomes the next phase of infrastructure network management, it still remains to be seen how India will start preparing for that phase without invoking political controversies. Given the phases outlined through this study, the principles of complete-cost recovery to ensure financial independence, and reducing the dependence on fuel tax (as it has already been proven to be a case of double taxation) and user-charges closer to cost-recovery would need to be considered.

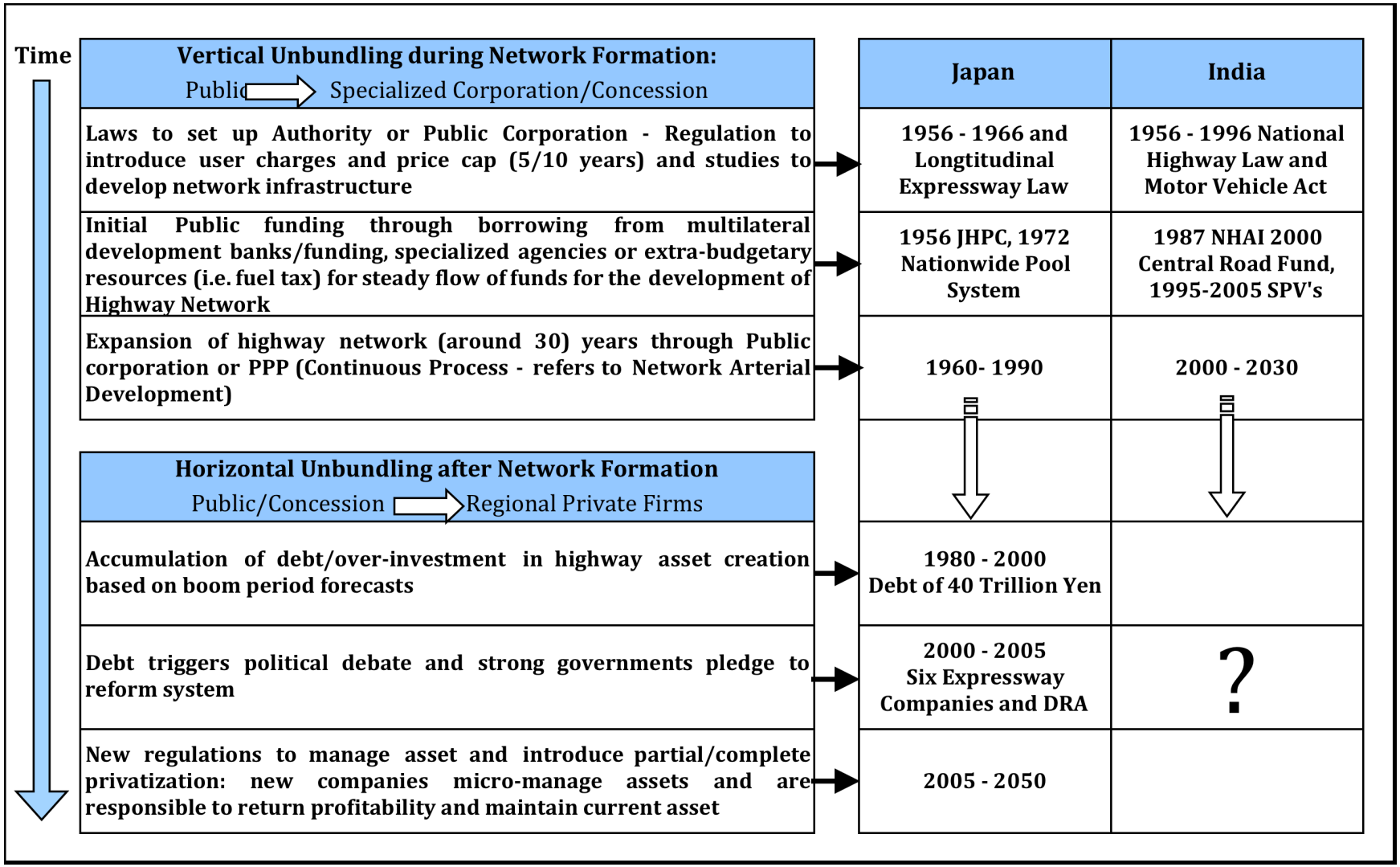
Figure 7.4 Comparative Highway Regulations - Timeline (India – Japan)

Japan			India	
		1850..	1851	Indian Tolls Act
		1950		
Japan Highway Public Corporation Law enacted,	1956		1956	The National Highway Law and National Highway Act of 1965,
National Development Longitudinal Expressway Construction Law – National Expressway Law Enacted	1957		1957	Ministry of Transport & Communications established
Metropolitan Expressway Public Corporation Law enacted	1959		1958	Bombay 20-year Road Development Plan (1961-81) Implemented
Hanshin Expressway Public Corporation Law enacted	1962	1960		
Meishin Expressway (First) to open, 71 km	1963		1966	Department of Transport, Shipping and Tourism in the Ministry of Transport and Aviation created
The National Development Longitudinal Expressway Construction Law was revised to incorporate plans for a 7,600-km nationwide network	1966		1967	The Ministry of Transport and Aviation was bifurcated into the Ministry of Transport & Shipping and the Ministry of Tourism & Civil Aviation
Honshu-Shikoku Bridge Authority Law enacted	1970	1970		
Establishment of corporations started in the same year. Up to present, 42 corporations have been established.				
Nationwide toll pool system implemented	1972			
			1978	National Transport Policy Committee, 12,955 km to be included in National highway network, but only over 3,500 km complete over the next 15 years
		1980	1981	Another Road Development Plan (1981-2001), known as the Lucknow Plan of the Indian Road Congress, has made a case for 66,000 km of National Highways by 2001
			1985	The Ministry of Transport & Shipping became the Department of Surface Transport
National Development Arterial Expressway Construction Law revised, and Japanese government approved expanding the network to 11,520 km.	1987		1986	The Department of Surface Transport under the Ministry of Transport was re-named as the Ministry of Surface Transport with effect from 22 October 1986.
			1987	Establishment of the National Highway Authority of India
			1988	NHAI Act and the Motor Vehicles Act
		1990	1991	Asian Development Bank-aided study on Long-Term Plan for Expressways in India, with10,020 km of expressways by 2015 at cost of Rs 580 Billion.
			1997	National Highways (Amendment) Act, details private investment in the building and maintenance of Highways, and toll collection rules
Law Concerning Urgent Special Measures to be taken in FY2003 to Reduce the Debt Burden of the Honshu-Shikoku Bridge Authority enacted	2003	2000	2000	Central Road Fund Act
Law Concerning Partial Revision of the National Expressway				The Ministry of Surface Transport was bifurcated into two Ministries viz., Ministry of Shipping and Ministry of Road Transport & Highways
Four laws concerning the privatization of the four major highway construction corporations enacted	2004		2004	Highway development overseen by the Committee on Infrastructure under the chairmanship of the Prime Minister.
Six expressway companies and Japan Expressway Holding and Debt Repayment Organization established	2005			The Ministry of Road Transport & Highways and Ministry of Shipping were merged
JHPC was privatized into 6 Expressway Companies and a debt management company that wiill oversee repayment of ¥40 trillion				
JHPC privatized, the privatization law required the firm to pay off all its debts within 45 years.			2009	Plans to develop an Expressway Corridors and create Expressway Authority The CoI, under the Chairmanship of the Prime Minister, replaced by Cabinet Committee on Infrastructure B.K. Chaturvedi Committee on National Highways Development Programme
		2010		

Source: Created by the Author

Note: Timeline

Figure 7.5 Phases in Highway Network Development: Based on Indian – Japan Case Study



Source: Created by the Author

Note: Timeline

7.3 Towards a Viable Model of Infrastructure Development and Financial Intermediation

From the analysis from the previous sections, it is appropriate to concur that all though the correlation between the financial sector intermediation and infrastructure unbundling (that is between public-private domain) is not strong, when implemented in parallel can make a large impact on economic growth. Figure 7.6 suggests the general variables that would need to be considered when trying to understand the relations between these two sectors. This study identifies key indicators both in the infrastructure regulation dimension and the financial sector intermediation dimension (refer to Figure 7.7 The Public Choice Framework in Infrastructure and Financial Sector Regulation

Source: Created by the Author

Figure 7.8) that could be used to develop a composite index, given the availability of more precise data. This could be used to profile the infrastructure provision and the level of financial intermediation in any given economy. The way in which these two dimensions relate within the public choice framework is detailed in Figure 7.7; it also reveals how the infrastructure sector and the financial system relate to each other in the larger political economy, and in particular to the highway and road sub-sector. This analysis has profiled these to dimensions for the national highway financing in India (Figure 7.9) and Japan (Figure 7.10) before and after the reforms in the highway sector under their respective financial structures. Further the two dimensions are then integrated to understand their interrelationship as unbundling takes place, as displayed in Figure 7.11 for vertical unbundling in India (since late 1980s) and Figure 7.12 for the horizontal unbundling in Japan (since mid-2000s).

The shift in highway infrastructure regulation has been profiled in all these figures, and the data from Table 7.2 is used to profile the changes in financial system over time. Given the availability of more data for these two dimensions based on the indicators proposed would provide a more detailed knowledge of shifts in these two sectors, and reconfirm the assumptions of this study (regarding the interrelationship between these two dimensions). It can be seen that the gradual financial system deepening and widening in the case is only complemented by infrastructure reforms that has allowed more private sector participation, while most control has been central. India has quite rapidly widened its market, all though long term funding that is bond lending is still small, and dominated by the government sector. Highway service provision still is centrally planned, designed and owned, PPP's have been allowed to develop and maintain assets. But in Japan's case where financial intermediation has been well developed with bond and bank markets lending at more that 200% of GDP, only suggest that funding through the market would not have been much of a problem. But infrastructure provision has moved from centralized, national institutions to more regionally managed and regional provision, in the Japanese case. But it is crucial that all these processes must be gradual, so as to not bring in economic and financial imbalances that contribute to public sector's rold in balancing efficiency and equity.

Table 7.2 was used to calculate the bond market size over time for the two countries between 1990 and 2009. The data used is only to provide the general view in order to understand the size of the financial markets and the way infrastructure can be managed. Eventually as indicator based on the ones identified below, could contribute to assessing more accurately which levels of financial intermediation through the various instruments could contributing to funding infrastructure needs, and across the infrastructure sectors.

Financial intermediation indicators could be more precisely developed, say for example the size of highway bonds annually issued and outstanding, construction company corporate bond size, highway toll securitization data, just to name a few, are beneficial in looking at how well infrastructure is being financed through the financial market. This could also extend to address the way in which governments fund network infrastructure, and how reliant they are on public funds (for example transport and fuel taxes), financial system instruments (for example bonds), and cost-recovery funds (for example tolls). This could be used to eventually evaluate the financial independence of the related authorities, in the relevant sectors so that political interference or public funding (to not affect tax payers) could be reduced.

In terms of financial intermediation, well-developed and functioning financial markets support the expansion of infrastructure investment, apart from ensuring that there is efficiency in savings-borrowings intermediation associated with information asymmetries and ensuring the stability of the political economy. It is crucial to therefore set policies that help to foster macroeconomic stability (fiscal management), allow access to financial services (financial deepening) and the development of financial markets (intermediation and achieving allocative efficiency) (OECD 2006, p. 206). Kaur, G., Lakshmanan, L, Rajesh, R., Kumar, N. (2010) identify three types of financing that has been used for financing infrastructure although they can be spread across bond markets, internal funds, equity and debt, bank loans, grants, government budgets, and development financial institutions:

- Public finance: government's provide equity financing through (especially initial investments) general budget reserve, earmarked reserves, self-raised funds (e.g. divestitures, lincensing fee, and sale, rental or leasing of government assets), and inter governmental grants and fiscal transfers. This also includes borrowing from international lending agencies, as the government guarantees the public debt financing either explicitly or implicitly.
- Debt financing in the public financing system is through policy loans at concessional rates, supplier credits and fixed income securities in the form of tax-secured bonds and revenue bonds secured by project-related revenue streams
- Corporate finance – includes corporate financing through equity financing (from retained earnings and shareholders' equity). Debt financing through commercial bank borrowing, subordinated debt (including convertible debentures and preferred stocks, privately placed borrowings, and issuance of fixed income securities.

Figure 7.6 The Relation Between Infrastructure and Financial Development: India's Case in General

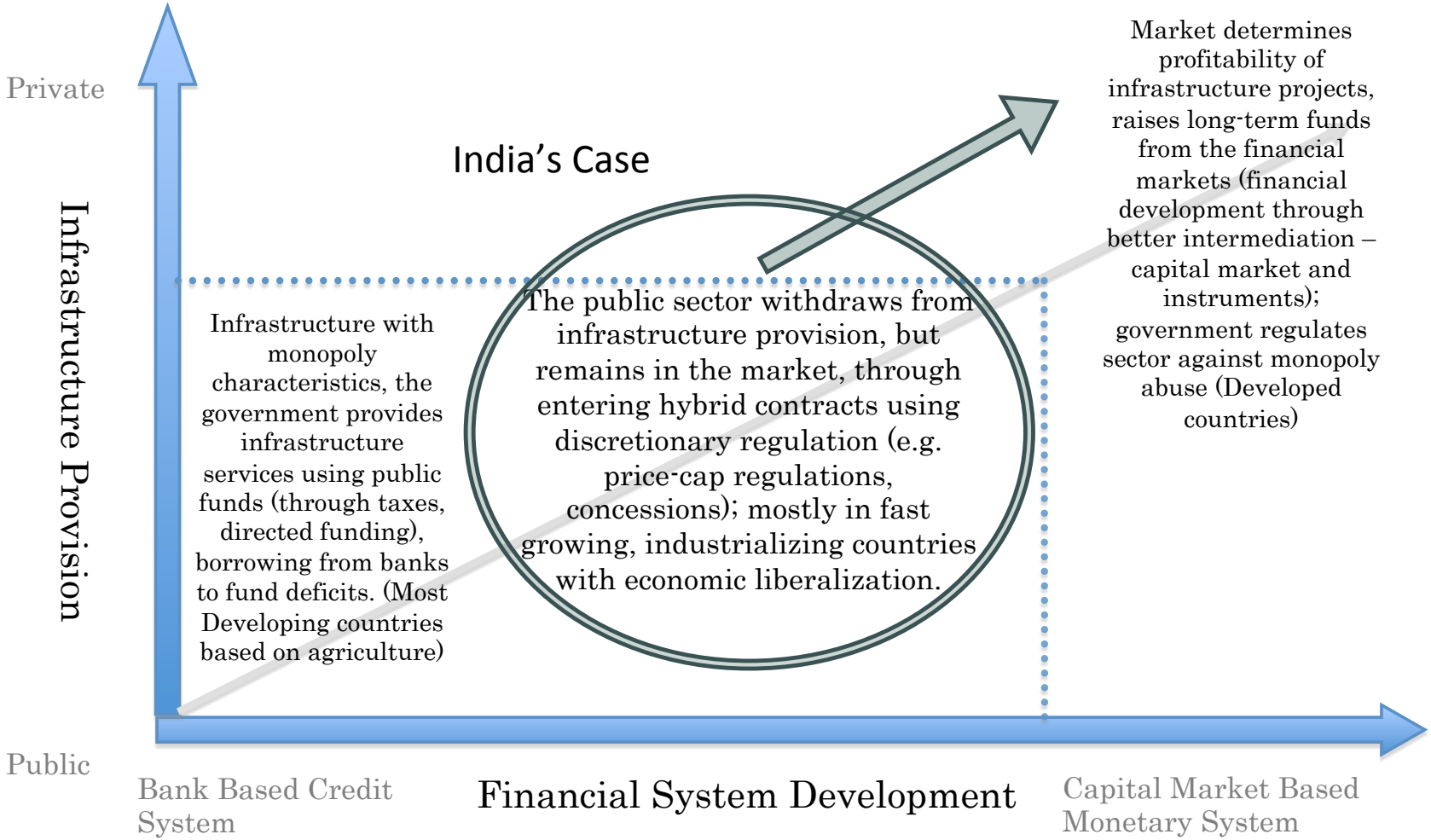


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Figure 7.7 The Public Choice Framework in Infrastructure and Financial Sector Regulation

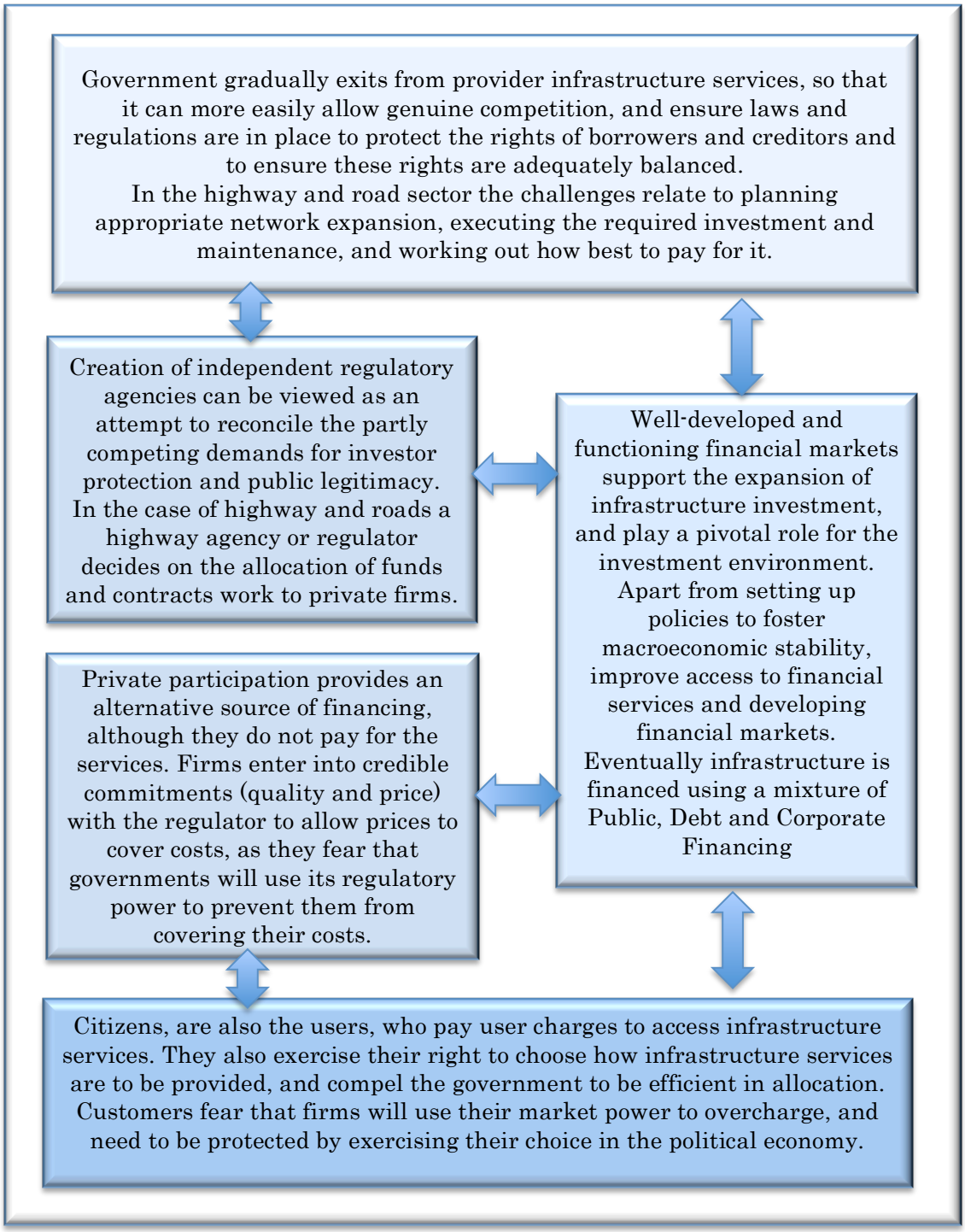

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Figure 7.8 Developing a Composite Index for a Two Dimensional Model Based on Infrastructure Provision and Financial Intermediation

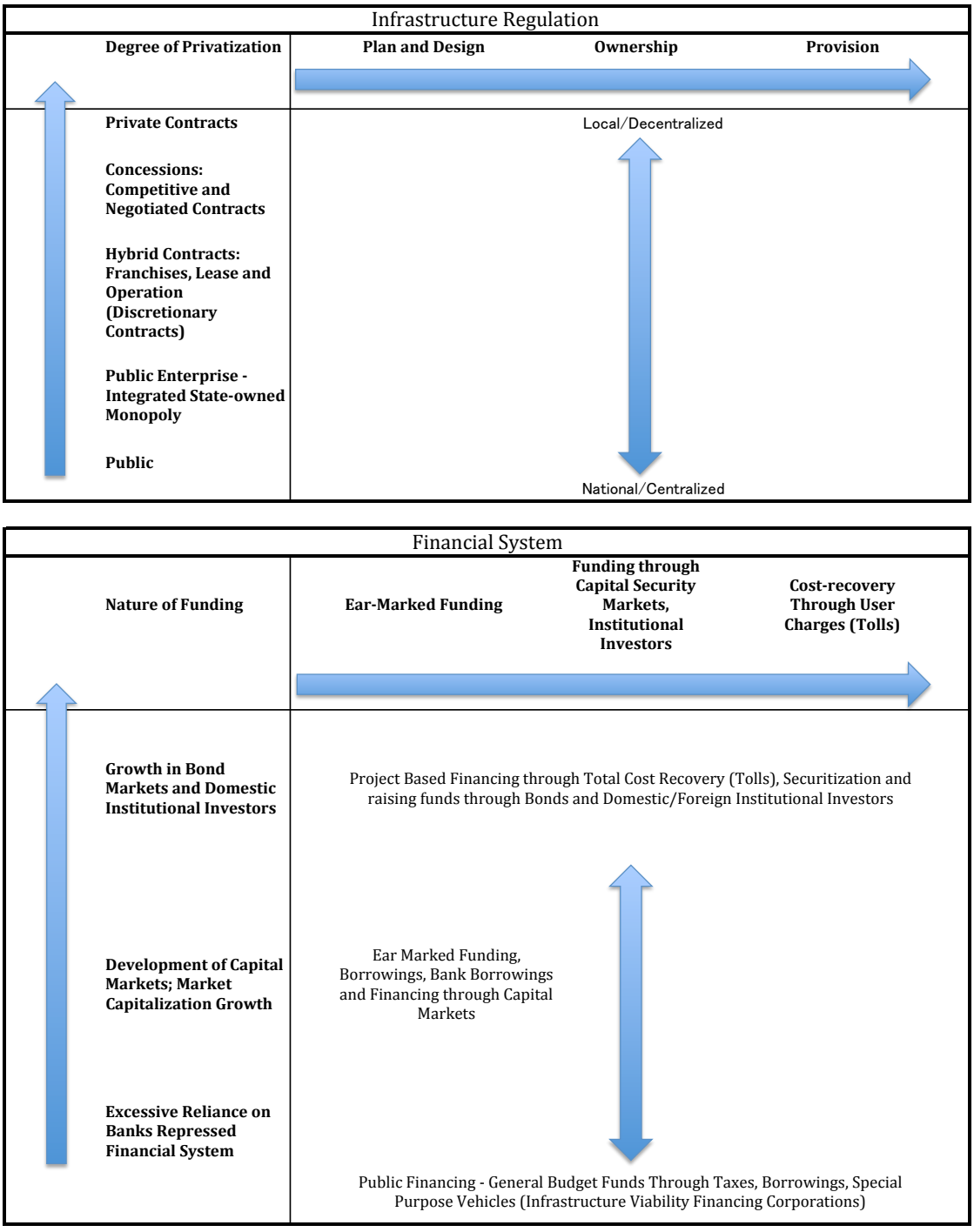

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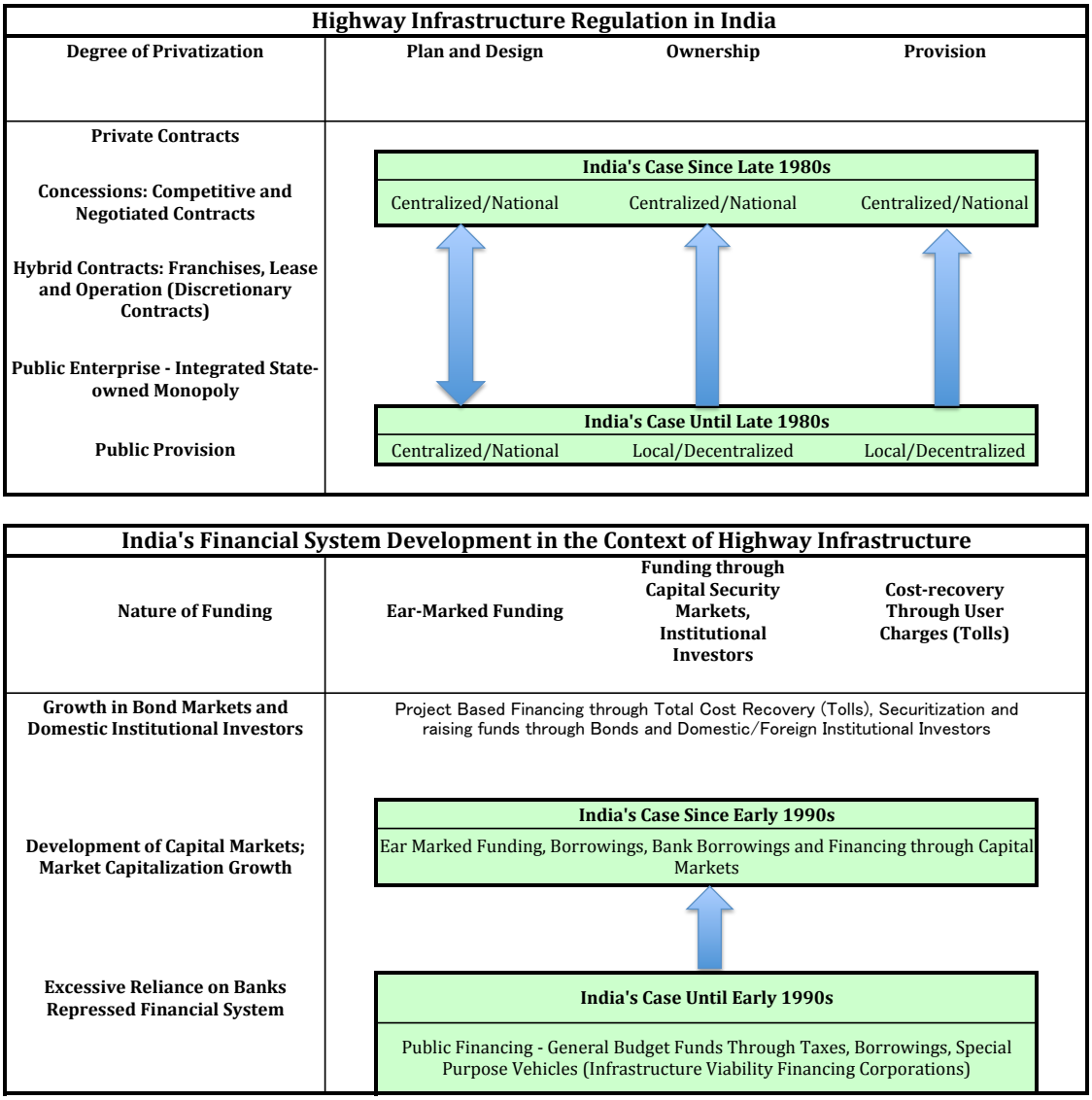
Figure 7.9 Profiling the Indian National Highway Regulation and Financial Sector Development Based on the Two Dimensional Model



Source: Created by the Author

Figure 7.10 Profiling the Japanese National Highway Regulation and Financial Sector Development Based on the Two Dimensional Model

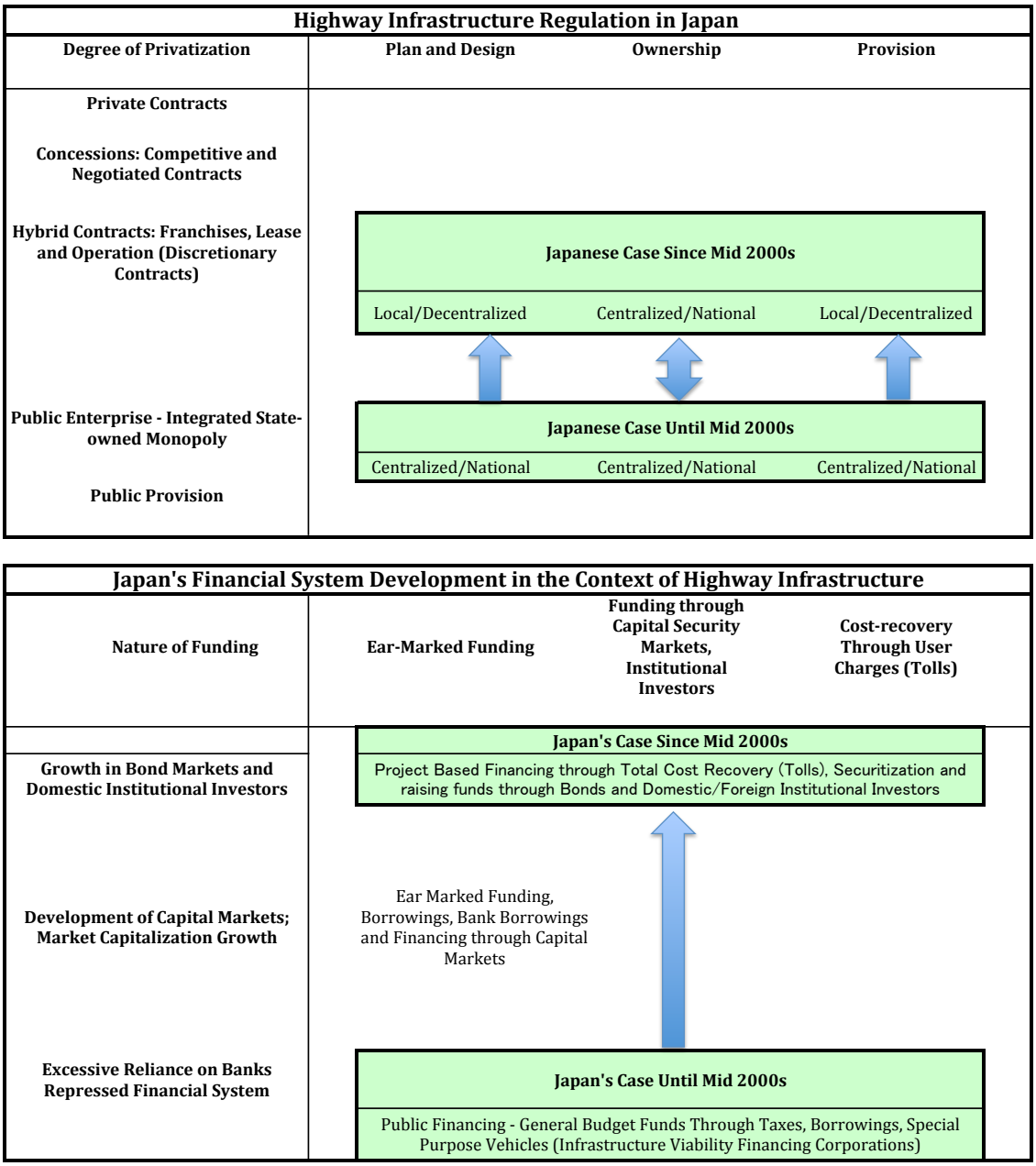


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Table 7.2 Financial Sector Data for India and Japan: Banking Sector, Capital Market and Securities Market

India						
	Banking Sector	Capital Market				Securities Market
Year	Domestic Credit Provided by Banking Sector (1)	Stock Market Capitalization (1)	Year	Bond Outstanding in US Dollar (Billion) By Sector and Residence of Issuer (2)	GDP - Constant 2000 US$ (Billion) (3)	Bond Issue - Amounts Outstanding as % GDP
1990	53.3	12.2	1990	67.948	270.50	25.12
1995	45.8	35.7	Mar-95	66.715	346.59	19.25
2000	53.7	32.2	Mar-00	103.762	460.18	22.55
2005	62.3	68.3	Mar-05	257.146	644.40	39.90
2009	79.3	101.2	Mar-09	449.885	874.94	51.42

Japan						
	Banking Sector	Capital Market				Securities Market
Year	Domestic Credit Provided by Banking Sector (1)	Stock Market Capitalization (1)	Year	Bond Outstanding in US Dollar (Billion) By Sector and Residence of Issuer (2)	GDP - Constant 2000 US$ (Billion) (3)	Bond Issue - Amounts Outstanding as % GDP
1990	262.6	96.7	1990	2761.98	4,122.34	67.00
1995	288.1	69.9	Mar-95	5082.959	4,445.37	114.34
2000	308.9	67.6	Mar-00	5975.861	4,667.45	128.03
2005	312.8	104.1	Mar-05	8858.315	4,980.84	177.85
2009	-	66.7	Mar-09	10234.587	4,870.45	210.14

Sources: Authors calculations from data sources below, all accessed 14th December 2010
(1) www.adb.org/documents/books/key_indicators/.../Key-Indicators-2010.pdf
(2) http://www.bis.org/statistics/secstats.htm
(3) http://data.worldbank.org/indicator/NY.GDP.MKTP.KD

Figure 7.11 Direction in National Highways Regulation and Domestic Financial Intermediation: India

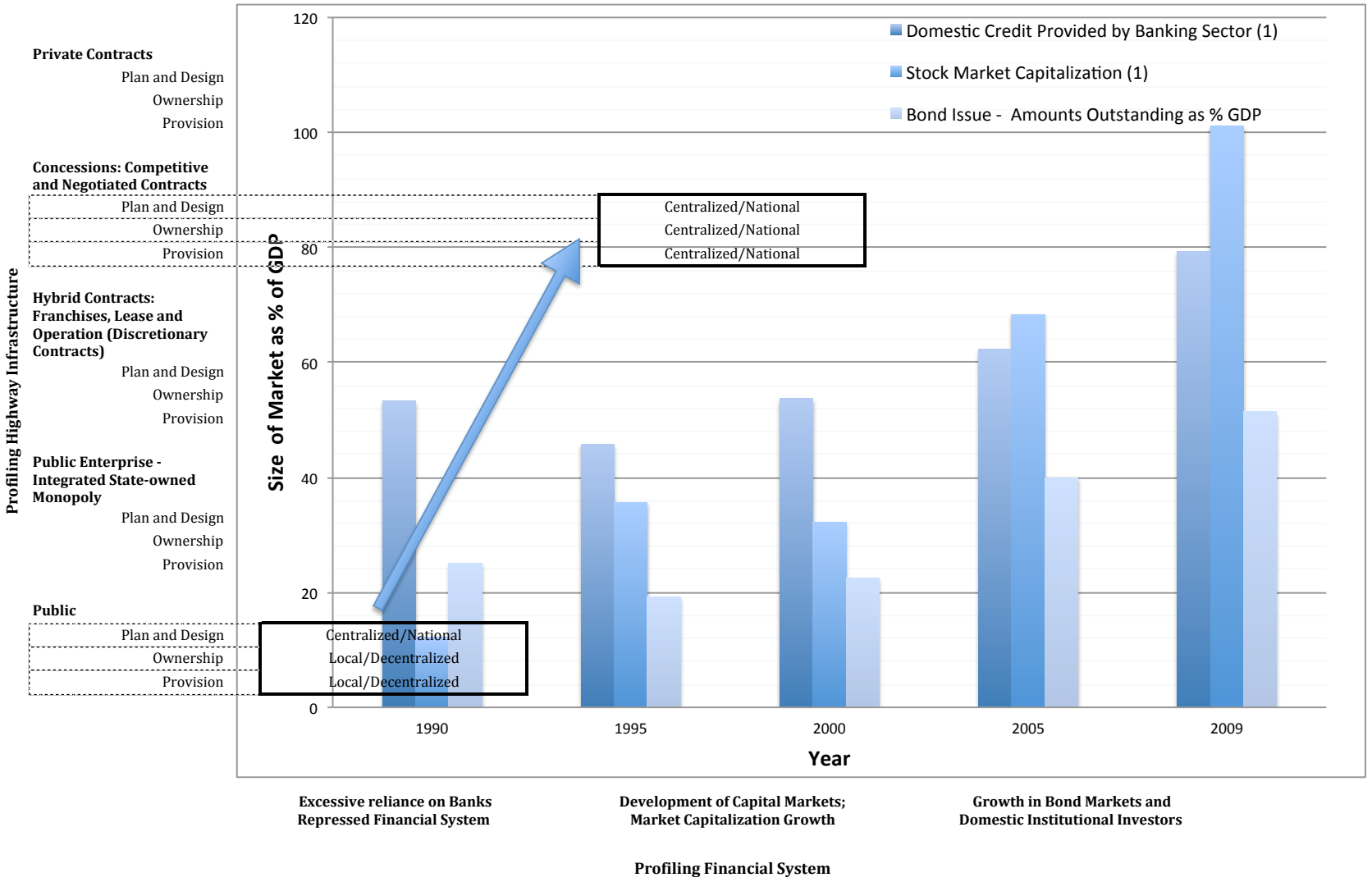

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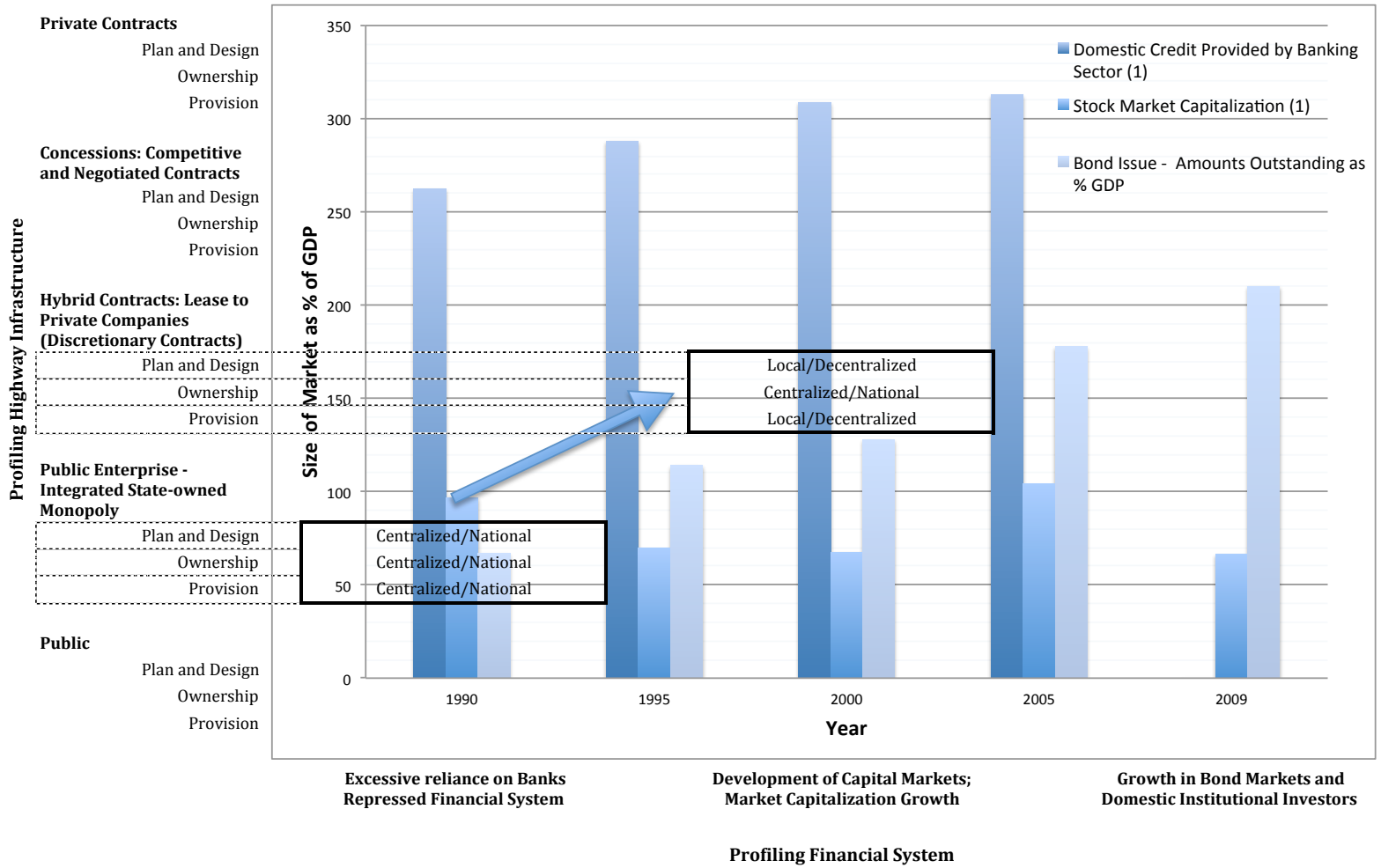
Figure 7.12 Direction in National Highways Regulation and Domestic Financial Intermediation: Japan



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8 Conclusion

Within an economy it is valuable to identify sub-sectors that will benefit from using the state's option (public choice) in allocative efficiency in funding (financial intermediation) and regulation (infrastructure unbundling) to allow PSP through concession contracts (legislation, competitive bidding and MCA's). As this research observed, although it is difficult to quantify the relationship between the financial system and the way infrastructure like the Highway is provided, in general as infrastructure provision shifts from public-private domain a well developed and intermediating financial system is required. Most developing countries that are developing their financial systems, expand and deepen according to their level of development and the functional requirements of the economy (that is agriculture based economies rely on a bank-based system, while developed economies require a well-developed securities market. But a financial system with more intermediaries and instruments can support long-term funding needs through better intermediation and diversifying risk. An efficiency-oriented sector (with high demand, large investments, and long gestation periods) like the national highways can only be developed effectively when public finance, is complemented through more developed financing markets, instruments, and intermediaries. The improved financial intermediation provides financial resources to the private sector to efficiently develop the sector and efficiently provide the services, but the role of the public sector remains crucial, as the private sector must be governed through regulations and independent authorities. The role of the state, although less significant, is crucial as regulator to enable allocation and at the same time provide beneficiaries with fair distribution and protection from capture and corruption by interested groups – agents including construction companies and developers, construction workers (as voter base), and so on.

The implications of this analysis suggest that the unbundling of infrastructure services when complemented with financial system development, could allow new opportunities for public-private cooperation in providing more efficient and effective funding mechanisms. Although highways account for only 2% of all roads in India they carry 40% of the road traffic, and require a steady supply of funds for network expansion in an already supply-side-constrained economy. This however initially requires heavy investments from the state through public finance; once trends in user-charges and traffic demand are set, the private sector will be less reluctant in competing to provide these services. In fact, where many countries turned to private toll roads to generate additional revenues for roads it should be remembered that tolls can only be economically viable, and collected on roads carrying relatively high volumes of traffic. India in fact already has one of the lowest costs of transport in the world, and so increasing tolls would need to be considered in the next twenty years time. The long-term plan would surely need to look at toll receipts, payouts of annuities, cess and of course funding instruments from a more well developed and regulated financial market, especially bonds and pension and insurance funds. Although there were plans to increase tolls a few times, considering the thin profits that the trucking sector operates on, they were postponed. There is already a growing discontent (especially in the trucking community) about the duplicity of events as commuters pay cess for road development and on top of that they pay tolls for the section of national highway used.

In India, the establishment of a specialized regulatory authority, NHAI, has allowed for the implementation of the National Highway Development Program essentially financed through:

- Fuel tax (on petrol and diesel through Central Road Fund)
- Borrowing from multilateral development agencies (World Bank, ADB, JBIC);
- Private sector finance through Public-Private Partnership concession

contracts;

- Charging Tolls - BOT Toll and BOT Annuities concession contracts are the most preferred – and companies raise funds through bank lending, while funds through equity and from special purpose Vehicles like the IIFCL is minimal. BOT PPP's in the Highway-Road sector have been the highest in the world 2007/8.

The analysis suggests that the shift in infrastructure development and provision as it shifts from the public to the private domain needs to be complemented with a shift in public finance to funding through more capital-market and specialized long term funding instruments (government and corporate bond markets, securitization, domestic institutional investors including pension, insurance, and mutual funds and so on).

Compare this to the way Japan developed and financed its Highways through:

- Initially borrowing from multilateral development institutions as loans through multilateral development agencies (World bank),
- Full cost recovery through user charges – tolls
- Principles of cross-subsidization (temporal, spatial), through the Japan Highway Public Corporation through channeling domestic institutional funds through the FILP
- Floating government bonds and government backed funds through the Fiscal and Investment Loan Program.

While a developing country like India grapples with a demand-supply gap in infrastructure availability, a developing economy like Japan struggles with the high debts in the process of developing high quality infrastructure and the cost of re-investment to replace or modernize the ageing infrastructure. Japan developed its highway rapidly and expanded to over 9,000 km, of which many stretches were developed to guarantee equitable access, and not on the basis of traffic demand, cost-benefit, or the viability of cost recovery. This resulted in the accumulation of huge debts of over Yen 40 Trillion and eventually the demise of the Agency that was responsible for developing expressways and highways (JHPC), also resulting in horizontal unbundling and privatization. As countries develop their highway system initially there is a need to find financial intermediation to support such large investments with long pay-back (gestation) periods. Japan was a successful case with a high savings rate both with households and the private sector, and the intermediation through postal savings through the FILP (which was in place till 2001) was indispensable for collecting deposits from the ordinary citizens to support public undertakings like the JHPC. This initially, with additional World Bank loans, contributed to assisting the financing of the JHPC developing its network. Japan was initially an ideal system, as it sought to develop its entire network through toll receipts, even without modern financial instruments such securitization and revenue amortization. Japan was able to develop its highway system rapidly, while at the same time as it achieved financial inclusion (high savings rate and development of domestic institutional investors), and the reduction in government deficits (the government did not absorb private savings to finance its deficits). When the JHPC was eventually privatized most of debts that the new Agency had to inherit were long term bonds was amounting to Yen 24 Trillion of the Yen 40 Trillion, while private sector debt and private sector bonds were over Yen 3 Trillion. Availability of long-term debt and government guaranteed bonds are crucial for creating more highway assets, but this also comes gradually as increased vehicle ownership and traffic data reduces private sector risk in taking up projects and bidding.

Since high volumes of traffic only occur on limited parts of the road network – typically on no more than 5 to 10 percent of the national road network and 1 to 2 percent of the total road network – this means that wholly private toll roads can only

meet a small part of the road sector's overall financing needs. However, since expressways are the busiest and most expensive sections of road to build and maintain, tolling can make a valuable contribution to the financing of the main trunk road network. As seen with the case of Japan, temporal and spatial cross-subsidization is crucial especially at the stage of network formation, but more self-sustainability principles need to be incorporated into the financing mechanisms over time, or it will lead to inefficiency and political influence susceptible of agency capturing the principal, and this would require more arm's-length or independent regulation. But Japan is actually on the other side: after successfully developing a network infrastructure over roughly 30 years, it started defaulting and overbuilding, without checks and balances. It took another 20 years to bring down the system, and it is now a huge public burden as the government grapples with recovering the debt.

India, similarly to Japan, started its Highway development program about two decades ago with humble beginnings, but is already close to developing an expressway program. But considering the evolution of ideas in terms of the availability of private sector funds and participation, the only impediment is seen to be the financial intermediation, as it does not have industrial banks or specialized agencies like the FILP in Japan to support its massive spending needs on an efficiency sector like the National Highways. The Indian government's more pressing obligations are in increasing social spending and alternative spending on other roads that cannot attract private investment. With fewer options of obtaining long-term funds the only way is to diversify the financial market, especially in terms of being able to provide long-term credit and the necessary regulations to maintain stability in those markets. Instead of crowding out the financial markets by borrowing to finance its deficits, the government, though gradually, has been allowing more private participation in terms of intermediating and providing the necessary funds to private participants that require long term funds. This also requires more innovative financing mechanisms, such as securitization of future tolls, corporate bonds and strengthening SPV's. In the long run there should also be a move towards more BOT-Tolls especially for more viable stretches and future Expressways.

Highway infrastructure investment can be politically contentious, as in Japan, where the JHPC was privatized into six private companies on the lines of Japan National Railways, and a debt exceeding Yen40 trillion is to be repaid in the next 40 years. The contentious policies of price-cap, equitable access through cross-subsidization promoted in the 1970s, and over-estimated traffic demand, have led to the over-investment and highways and expressways. This eventually ran against the principles of full cost recovery as infrastructure asset creation was not based on real demand, but was centered on equitable access. Japan faces the challenge of an aging stock of highway assets, and more investments that would be required in the maintenance and renewal of assets in line with newer technology, and safety standards. Apart from investing more in renewing assets beyond their design life, the capital and interest of the existing debt would need to be paid off.

This study deduced that there are similarities in the early phase of vertical unbundling in developing the network infrastructure of national highways in India and Japan, but doubts still remain as to what form of regulatory arrangement will evolve in India. In India, which has had less than 15 years of experience in implementing the different phases of the highway development program, there are already issues of spatial cross-subsidization and price-cap regulations that could affect profitability of service provision. Although the principle of full cost-recovery would be impossible to incorporate in the near future as a rise in the tolls would politically infeasible, the role of tolls in funding the other phases (of NHDP) and repayment is largely under-estimated. In India the cash flow estimates already assume an annual increase in the volume of cess-funds, which in the long term might prevent debt accrual, but there exists the danger of the eventual over-investment in under-used assets. The key would

be to develop a more financially sustainable model that would eventually phase out the fuel tax (or use it towards environmental or congestion purposes) and improve cost-recovery through user charges.

When implementation of infrastructure unbundling and financial intermediation (deepening) are parallel, this would enhance public choice in drawing private sector participation in the construction and financing of concession contracts (especially Build-Operate-Transfer - Toll). Infrastructure provision in India, as in most other emerging countries, has been dominated by government ownership and provision, through state departments and state-owned enterprises. Without providing the ownership rights (privatization), private sector participation requires incentives (profitability) to bid for projects, and options should be available in raising funds through the capital and security markets (corporate bonds, insurance and domestic institutional investors). Policy options for India in the:

- Short term: would be the continuation of the cess for network development and to provide equitable access, and slowly encouraging private sector participation through concessions using Tolls and viability gap funding until long term funding is available in the financial market;
- Long term: full-cost recovery principle has to be integrated to allow private sector to recover costs, through improved regulation, more efficient pricing (user charges), and allowing for infrastructure firms to tap long term funds from financial markets (instruments and stability).

8.1 Value Additions of this Research

This academic investigation sought to deduce the prospects of financial intermediation in the long-term funding of infrastructure. The nature and extent of infrastructure regulations required to achieve allocative efficiency in order to make investments sustainable, profitable, and allowing for private sector participation, were also evaluated. While both financial system intermediation and infrastructure development are crucial for economic development, their correlation has not been direct, and their interrelation has not been well documented. By evaluating the financing needs during the different phases of highway network development, regulations that enshrine principles of cost-recovery, equitable access, cross-subsidization, and promoting competition in infrastructure services need to be developed. Financial reforms to improve financial intermediation can complement infrastructure unbundling and provide for long term funding that is required.

- The study has been unique in choosing public choice to understand the options in achieving efficient financing of services of general interest: using the case of National Highways in India. Chose two variables (vectors): domestic financial intermediation in improving long term funding and improved infrastructure regulation to improve cost-recovery through user charges.
- Using Public Choice Approach to fill the policy gap in understanding what kind of financial system, and instruments support funding in infrastructure such as highways.
- The study of Indian National Highways (which is only developing its Highway network now, using innovative methods such as PPP), and the comparative study with the Japan Highway system (which is in its post-development phase facing privatization and debt recovery and serious in issues in profitability).
- Developed a two dimensional model to plot the correlation between infrastructure provision (between the public and private domain) and financial system development (between bank-based credit system and capital market-based monetary system).

8.2 Recommendations for future Research:

- Scenario analysis can be done based on integrating improved cost-recovery scenario through user-charges. This could simpler, considering the existence of new networking technology (that is Intelligent Transport Systems that also includes Electronic Toll Collection) and demand analysis (more studies using project finance principles based on vehicle ownership data, origin-destination traffic surveys, and traffic forecasting).
- Intermodal and multi-modal transport studies to ensure competiveness of all the modes and integrate systems to make transport more sustainable. Road/rail competition is also a growing concern in India where better highways would largely benefit large trucks carrying freight: this would call for more direct policies that would ensure the profitability of both these infrastructure services.
- Looking at highway construction companies and their market capitalization. To evaluate if these companies are slowly moving away from short term financing from banks, mutual funds, and viability gap funds provided by government institutions specialized in providing infrastructure credit (claimed now at a maximum of 40% upfront at the start of project).
- Scope of project financing in individual stretches of the Indian National Highways, to be able to look at the cost/benefits and rates of return. The eventual horizontal unbundling of services in order to ensure profitability and incentives for PSP and profitability
- Investigating serious issues such as delays due to land acquisition, environmental clearances, project overrun costs, political unrest in certain states, pricing to achieve sustainability in maintenance and creation of new assets, and so on.
- Possibly looking at the third dimension (apart from the two dimensions of focus in this research) of risk, which is a crucial aspect in both infrastructure investment and protecting investors who invest through the financial systems and instruments.
- To compare and evaluate the regulatory reforms and public funding of highways (efficiency sector) and all other roads (equity sector), using public choice and public finance approaches, especially in the context of Indian political economy (for example planning and finance commissions and central road fund).

BIBLIOGRAPHY

3iNetwork. (2003). India Infrastructure Report 2004.

40655, P. N. (2007). Proposed Multitranche Financing Facility India: India Infrastructure Project Financing Facility.

Aziz, J. (2008). Deconstructing China's and India's Growth: The Role of Financial Policies.

Aziz, J. (2008). Real and Financial Sector Linkages in China and India.

ADB (2006), Facilitating Public Private Partnership for Accelerated Infrastructure Development in India, Regional Workshops of Chief Secretaries on Public Private Partnership, Workshop Report, December 2006

ADB. (2008). India - 2008 Fact Sheet. *India - 2008 Fact Sheet* .

ADB. (2005). India: National Highway Corridor (Sector) I Project.

ADB. (2008). *India's Bond Market— Developments and Challenges Ahead by Wells, Stephen; Schou-Zibell, Lotte.* Asian Development Bank, Office of Regional Economic Integration.

ADB. (2007). *Proposed Multitranche Financing Facility India: India Infrastructure Project Financing Facility.* Report and Recommendations of the President to the Board of Directors, Asian Development Bank, Project No. 40655.

Agarwal, O., & Somanathan, T. (2005). Public Policy Making In India: Issues and Remedies.

Ahluwalia, M. S. (2002). Economic Reforms in India since 1991: Has Gradualism Worked? *The Journal of Economic Perspectives , Vol. 16, No. 3. (Summer, 2002), pp. 67-88.*

Ahluwalia, M. S. (2006). India's Experience with Globalisation. *The Australian Economic Review, vol. 39, no. 1, pp. 1--13* .

Ahmad, E., & Brosio, G. (Eds.). (2006). *Handbook of Fiscal Federalism.* Edward Elgar Publishing Limited.

Akanda, A. (2003). ADB Transport Sector Strategy for India - The Roads Subsector.

Alamgir, J. (2009). *India's Open-Economy Policy: Globalism, rivalry, continuity.* Routledge, Oxon.

Alexander, I., & Estache, A. (1999). Infrastructure Restructuring and Regulation - Building a base for sustainable growth.

Alexander, S. D., & Hutton*, A. (1997). The Scottish Political Economy Tradition and Modern Economics. *Scottish Journal of Political Economy , Vol. 44.*

Anderson, S. K. (2000). Book Reviews: Comparing Asian Politics: India, China, and Japan by Sue Ellen M. Charlton. *The Social Science Journal, , Vol. 37*, 145-160.

Andre, R. L., & Proost, S. (2007). Investment and the Use of Tax and Toll Revenues in the Transport Sector: The Research Agenda. *Research in Transportation Economics , Volume 19*, 1-26.

Amable, B., & Chatelain, J.-B. (2001). Can financial infrastructures foster economic development? *Journal of Development Economics , Vol. 64*, 481-498.

Amitendu, R. K., & Singh, K. (2007). Sustainability of Economic Growth in India. *The Centre for International Governance Innovation, Working Paper 25* .

Apostolis, K. A., & Tsionas, E. (2008). Does public sector efficiency matter? Revisiting the relation between fiscal size and economic growth in a world sample. *Scottish Economics Society Conference.*

Arun, T., & Turner, J. (2002). Public Sector Banks in India: Rationale and Prerequisites for Reform. *Annals of Pubic and Cooperative Economics , 73*, 89-109.

Arund, T. G., & Turner, J. D. (2002). Financial Sector Reforms in Developing Countries: the Indian Experience. *Blackwell Publishing* .

Arvind, R. R., & Tokatlidis, I. (2006). India's Pattern of Development: What Happened, What Follows?

Arestis, P., & de, L. F. (Eds.). (2008). *Financial Liberalization and Economic Performance in Emerging Countries.* Palgrave Macmillan Ltd., New York.

Atukeren, E. (2005). Interactions Between Public and Private Investment: Evidence from Developing Countries. *KYKLOS* .

Athias, L., & Saussier, S. (2007). Contractual Flexibility or Rigidity for Public Private Partnerships? Theory and Evidence from Infrastructure Concession Contracts 1.

Buiter, W. H., & Patel, U. R. (2005). India's Public Finances: Excessive Budget Deficits, a Government-Abused Financial System and Fiscal Rules.

Bussiere, M., & Mehl, A. (2008). China's and India's Roles in Global and Finance: Twin Titans for the New Millennium.

Burningham, S., & Stankevich, N. (2005). Why road maintenance is important and how to get it done.

Burns, P., & Estache, A. Information, Accounting and the Regulation of Concessioned Infrastructure Monopolies.

Burnside, C. (Ed.). (2005). *Fiscal Sustainability in Theory and Practice - A Handbook.* World Bank, Washington D.C.

Banerjee, A., & Somanathan, R. (2007). The political economy of public goods: Some evidence from India. *Journal of Development Economics , 82*, 287-314.

Banerjee,, A. V., & Duflo, E. (2003). Bank Financing in India.

Basu, D. (1997). Challenges for the Debt Market.

Basu, K., & Maertens, A. (2007). The Pattern and causes of economic growth in India. *Oxford Review of Economic Policy , Volume 23*, pp.143 -- 167.

Basu, S. (2006). Structural Problems in Financing Development: Issues Relating to India. *International Review of Applied Economics , Vol. 20*, 85-101.

Barger, T. (1998). *Financial Institutions Lessons of Experience.* International Finance Corporation, Washington.

Barth, J. R., McCarthy, D., Phumiwasana, T., & Yago, G. (2006). Opportunities and Challenges in Asian Bond Markets. In J. R. Barth, & G. Yago (Eds.), *Asia's Debt Capital Markets.* New York: Milken Institute.

BCG, & Knowledge@Wharton. Whats's Next for India: Beyond the Back Office.

Beesley, M. (1997). *Privatization, Regulation and Deregulation.* Taylor and Francis Routledge, London.

Berry, S., & Singh, K. Domestic Financial Liberalization and International Financial Integration: An Indian Perspective.

Bird, R. M., & Vaillancourt, F. c. (Eds.). (2008). *Perspectives on Fiscal Federalism.* World Bank, Washington D.C.

Bhaskar, V., & Gupta, B. (2007). India's development in the era of growth. *Oxford Review of Economic Policy , Volume 23*, pp.135 -- 142.

Bhattacharya, B., & Kar, S. Shocks, Economic Growth and the Indian Economy.

Bhattacharya, S., & Patel, U. R. (2003). Reform Strategies in the Indian Financial Sector. *IDFC* .

Blyth, M. (July 2003). From Comparative Capitalism to Economic Constructivism: The Cornell Series in Political Economy. *New Political Economy , Vol. 8*.

Black, J. A., & Rimmer, P. J. (1982). Japanese Highway Planning: A Western Interpretation. *Transportation , 11*, 29-49.

Bladikas, A., & Pignataro, L. J. (1990). Efficiency and Equity Issues in Special Fees for Financing Transportation Infrastructure. *Transportation Research Part A , Vol. 24*, pp. 283-292.

Blejer, M. I., & Skreb, M. (2002). *Financial Policies in Emerging Markets.* Massachusetts Institute of Technology Press.

Block, W. (2009). *The Privatization of Roads and Highways: Human and Economic Factors.* Ludwig von Mises Institute, Alabama.

Block, S. A., & Vaaler, P. M. (2004). The price of democracy: sovereign risk ratings, bond spreads and political business cycles in developing countries. *Journal of International Money and Finance , 23*, 917-946.

Bourguignon, F. c., & Pleskovic, B. (Eds.). (2008). *Rethinking Infrastructure for Development.* World Bank, Washington D.C.

Bowden, B., & Seabrooke, L. (2006). Civilizing Markets through Global Standards. In B. Bowden, & L. Seabrooke (Eds.), *Global Standards of Market Civilization.* 2006: Routledge.

Bosch, N., & M.Duran, J. (Eds.). (2008). *Fiscal Federalism and Political Decentralization: Lessons from Spain,Germany and Canada.* Edward Elgar Publishing Limited, UK.

Bose, S., & Coondoo, D. (2003). A Study of the Indian Corporate Bond Market.

Bose, S., & Jalal, A. (1998). *Modern South Asia: History, Culture and Political Economy.* Taylor and Francis Routledge, London.

Bottelier, P. (2007). What India Can Learn from China and Vice Versa. *China & World Economy / 52 -- 69, Vol. 15, No. 3* .

Braöthen, S. (2005). Financing and Regulating Highway Construction in Scandinavia - Experiences and Perspectives. *Research in Transportation Economics, , Volume 15*, 175-186.

Brixi, H. P., & Irwin, T. (2004). Fiscal support for infrastructure: Toward a more effective and transparent approach. *ADB-JBIC-World Bank East Asia Pacific Infrastructure Flagship Study* .

Brownbridge, M., & Kirkpatrick, C. (2000). Financial Regulation in Developing Countries. *Journal of Development Studies, , 37*, 1-24.

Cull, R. J. Financial Sector Adjustment Lending: A Mid-Course Analysis.

C., M. B. (2000). Financial Regulation in Developing Countries. *Journal of Development Studies, Online Publication Date: 01 October 2000* .

C.B., M. B., & Winsten, C. B. (1956). *Studies in the Economics of Transportation.* Yale University Press, New Haven.

C.H.Chai, J., & C.Roy, K. (2006). *Economic Reform in China and India: Development Experience in a Comparative Perspective.* Edward Elgar Publishing Limited, UK.

E, A. D., & Levine, R. (2001). *Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development.* The MIT Press, Cambridge.

Cecilia, N. S. (2004). Infrastructure Services in Developing Countries: Access, Quality, Costs and Policy Reform.

Chakrabarty, B. (2008). *Indian Politics and Society since Independence.* Routledge, London.

Chanzdavarkar, A. (1994). Infrastructure Finance - Issues, Institutions, and Policies. *POLICY RESEARCH WORKING PAPER 1374* .

Chandavarkar, A. (1994). Infrastructure Finance: Issues, Institutions, and Policies.

Chen, A. H. (2002). A new perspective on infrastructure financing in Asia. *Pacific-Basin Finance Journal 10 (2002) 227 -- 242* .

Chen, A., & Subprasom, K. (2007). Analysis of regulation and policy of private toll roads in a build-operate-transfer scheme under demand uncertainty. *Transportation Research Part A , 41*, 537-558.

Chen, L. (2008). Preferences, Institutions and Politics: Re-Interrogating the Theoretical Lessons of Developmental Economies. *New Political Economy , 13*, 89 --- 102.

Chiang,, Y. H., & Raferty, J. (Eds.). (2004). *The Construction Sector in Asian Economies.* Spon Press, London.

Chisholm, A. M. (2002). *An Introduction to Capital Markets.* John Wiley & Sons, Inc., Hoboken, New Jersey.

Chhibber, A. (1997). The State in a Changing World. *Finance & Development, World Bank* .

Choudhary, K. (Ed.). (2007). *Globalisation, Governance Reforms and Development in India.* Sage Publications, New Delhi.

Clerides, S., & Zachariadis, T. (2008). The effect of standards and fuel prices on automobile fuel economy: An international analysis. *Energy Economics , 30*, 2657-2672.

Cnossen, S., & Sinn, H.-W. (Eds.). (2003). *Public Finance and Public Policy in the New Century.* The MIT Press, Cambridge.

Coates, D. (Ed.). (2005). *Varieties of Capitalism, Varieties of Approaches.* Palgrave Macmillan Ltd., New York.

Conference, A. R. (n.d.). Facilitating Public Private Partnership for Accelerated Infrastructure Development in India. *Facilitating Public Private Partnership for Accelerated Infrastructure Development in India* .

Committee on Infrastructure. (2006). *Financing of the National Highway Development Programme.* The Secretariat for the Committee on Infrastructure, Government of India, Report of the Core Group, CoI, New Delhi.

Crampes, C., & Estache, A. (1997). Regulatory trade-offs in the design of concession contracts.

Creightney, C. (1993). Road User Taxation in Selected OECD Countries.

European Central Bank. (2003). Public Sector Efficiency: An International Comparison.

European Central Bank. (2006). Public Sector Efficiency: Evidence For New EU Member States and Emerging Markets.

Easterly, W. (Journal of Economic Growth, 6: 135--157 (June 2001)). The Lost Decades: Developing Countries' Stagnation in Spite of Policy Reform 1980--1998. *Journal of Economic Growth, 6: 135--157 (June 2001) , 2001.*

Economic, D. o., & Bank, A. D. (2006). Facilitating Public-Private Partnership for Accelerated Infrastructure in India. *Regional Workship of Chief Secretaries on Public-Private Partnership* .

Economist. (Dec 11th 2008). An elephant, not a tiger. *An elephant, not a tiger* .

Economist. (Mar 5th 2009). Bridges to somewhere. *Bridges to somewhere* .

Economist. (Oct 14th 2008). India and the credit crisis. *India and the credit crisis* .

Economist. (Dec 11th 2008). Storm-clouds gathering. *Economist: Special Reports* .

Economist. (Mar 31st 2009). Structural shift in India. *Economist: Global Agenda* .

Eichengreen, B., & Razo-Garcia, R. (2006). The international monetary system in the last and next 20 years. *Economic Policy* .

Ehrhardt, D., & Irwin, T. (2004). Avoiding Customer and Taxpayer Bailouts in Private Infrastructure Projects.

Election Commission of India. (2010). From Election Commission of India: http://eci.nic.in/eci_main/index.asp

Elizabeth, E. G., & Jackson, H. E. (Eds.). (2008). *Fiscal Challenges: An Interdisciplinary Approach to Budget Policy.* Cambridge University Press, New York.

Ensor, J. D. (2005). Multi-Criteria Analysis: An Alternative Approach for the Evaluation of Road Pricing Strategies. *Multi-Criteria Analysis: An Alternative Approach for the Evaluation of Road Pricing Strategies* .

Equity, I. B. Indian Infrastructure.

Esfahani, H. S., & Ramƒ±rez, M. T. (2003). Institutions, infrastructure, and economic growth. *Journal of Development Economics , 70*, 443-477.

Estache, A., & Fay, M. (2007). Current Debates on Infrastructure Policyr.

Estache, A., & Iimi, A. (2008). Procurement Efficiency for Infrastructure Development and Financial Needs Reassessed.

Estache, A., & Serebrisky, T. (2004). Where Do We Stand on Transport Infrastructure Deregulation and Public-Private Partnership?

Estache, A., Romero, M., & Strong, J. (2000). *The Long and Winding Path to Private Financing and Regulation of Toll Roads.* Policy Research Working Paper 2387, World Bank.

Erik, K. J., & Welde, M. (2006). Operating costs in Norwegian toll companies: A panel data analysis*.

Dubash, N. K., & Rao, D. N. (2008). Regulatory practice and politics: Lessons from independent regulation in Indian electricity. *Utilities Policy , 16*.

Dunn, B. (2009). *Global Political Economy: A Marxist Critique.* Pluto Press, London.

David, B., & Berechman, J. (2000). *Transport Investment and Economic Development.* University College London.

David, M. M. (Ed.). (2004). *Leading Issues in Competition, Regulation and Development.* Edward Elgar Publishing Limited, UK.

Dailami, M., & Klein, M. (1997). Government Support to Private Infrastructure Projects in Emerging Countries.

Das, P. K., & Guha-Khasnobis, B. (2007). Financial sector developments and growth in China and India -- Some speculations.

Dastidar,, S. G., & Khanna, T. (2008). Testing Limits to Policy Reversal: Evidence from Indian Privatizations. *Journal of Financial Economics , 89*, 513-526.

D'Costa, A. P. (2003). Uneven and Combined Development: Understanding India's Software Exports. *World Development , Vol. 31,* (No. 1), 211–226.

Development Financial Institutions: An Introduction.

Debasree, E. I., & Weissburg, P. (2007). Toward Developing a Structured Approach to the Diagnosis and Resolution of Nonperforming Loans: The Case of China and India. *Review of Policy Research, , Volume 24*.

Denoon, D. B. (2007). *The Economic and Strategic Rise of China and India Asian Realignments after the 1997 Financial Crisis.* Palgrave Macmillan Ltd., New York.

Desai, P., & Bhagwati, J. (1975). Socialism and Indian Economic Policy. *World Development , Vol. 3*, pp. 213-221.

Desai, R. M., & Gueorguiev, N. (1998). The Political Economy of Financial Repression in Transition Economies. *World Bank Policy Research Working Paper 2030* .

Derkson, W. W., & J.Shurvell, S. (1999). Fuel Taxes and Road Expenditures: The Missing Link.

Dinan, T., & Austin, D. (2004). Fuel Economy Standards Versus a Gasoline Tax.

Doi, T., & Hoshi, T. (2003). Paying for the FILP. *NBER Chapters, in: Structural Impediments to Growth in Japan, National Bureau of Economic Research, Inc.* , 37-70.

Doh, J., & Ramamurti, R. (2003). Reassessing Risk in Developing Country Infrastructure. *LongRangePlanning 36 (2003) 337--353* .

Dohb, J. P. (2004). Rethinking foreign infrastructure investment in developing countries. *Journal of World Business 39 (2004) 151--167* .

Dornan, D. L. (2002). Asset management: remedy for addressing the fiscal challenges facing highway infrastructure. *International Journal of Transport Management , 1*, 41-54.

Fujii, Y. (1989). User Charges, Cross-subsidization, and Public Subsidy - The Case of Expressways in Japan. *Transportation Research Part A , Vol. 23A*, 7-12.

Fayard, A. (2005). Analysis of Highway Concession in Europe. *Research in Transportation Economics , Volume 15*, 15-28.

Fayard, A. (1999). Overview of the Scope and Limitations of Public-Private Partnerships.

Feldman, A. M., & Serrano, R. (2006). *Welfare Economics and Social Choice Theory.* New York: Springer Science and Business Media Inc.,.

Fernandes, L. (2006). *India's New Middle Class: Democratic Politics in an Era of Economic Reform.* University of Minnesota Press, Minneapolis.

Financing National Highways in India.

Fisher, G. (n.d.). Private Financing of Toll Roads. *RMC Discussion Paper Series 117* .

Fleming, S. (2007). India's shackles.

Foldvary, F. E. (2005). Infrastructure: Optimal Private and Governmental Funding and Provision. *IEA Economic Affairs, Institute of Economic Affairs 2005* , 25-30.

for, T. S. (n.d.). Financing Infrastructure Projects through the India Infrastructure Finance Company. *Financing Infrastructure Projects through the India Infrastructure Finance Company* .

for, T. S. Financing Infrastructure Projects through the India Infrastructure Finance Company.

for, T. S. (2006). Financing of the National Highway Development Programme.

Franklin, S. D. India's Financial System.

FRBSF. (2002). Japan Passes Again on Fundamental Financial Reform.

Freire, M., & Petersen, J. (Eds.). (2004). *Subnational Capital Markets in Developing Countries: From Theory to Practice.* The International Bank for Reconstruction and Development / Oxford University Press.

Friedman, E., & Gilley, B. (2005). *Asia's Giants: Comparing China and India.* Palgrave Macmillan Ltd., New York.

Gunnar, J. R., & Litvack, J. (2003). *Fiscal Decentralization and the Challenge of Hard Budget Constraints.* MIT Press, Cambridge.

Gupta, A. (2006). How wrong has the Indian Left been about economic reforms?

Gupta, L. C., & Gupta, C. P. (2001). Financing Infrastructure Development: A Holistic Approach with Special Reference to the Power Sector.

Gurumurthy, R. (2006). Competition in financial sector and Competitiveness of Indian financial markets.

G., W. D., & Hancher, L. (Eds.). (2008). *New Perspectives on Investment in Infrastructure.* Amsterdam University Press.

Gwilliam, K. M., & Kumar, A. (2002). Road Funds Revisited: A Preliminary Appraisal of the Effectiveness of ``Second Generation'' Road Funds.

Galbis, V. (1995). Financial Sector Reforms in Eight Countries: Issues and Results.

Gallagher, M., & Mitchell, P. (Eds.). (2005). *The Politics of Electoral Systems.* Oxford University Press, New York.

Gaobo, B. P., & Wes, M. (2005). India---East Asian Growth, Latin American Deficits. *World Bank.*

Garcia, E., & Dalla, I. (2005). The Role of Supranational Institutions in Local Currency Bond Markets: The Experience of the ADB and the IDB The Experience of the ADB. *Infrastructure and Financial Markets Review , Vol. 11.*

Ghate, C. (2008). Understanding divergence in India: a political economy approach. *Journal of Economic Policy Reform , Vol. 11*, 1-9.

Ghate, C. (2007). The Political Economy of Infrastructure Investment in India. *Discussion Papers on Entrepreneurship, Growth and Public Policy* .

Ghosh, B., & Deb, P. (2005). Investigating the linkage between infrastructure and regional development in India: era of planning to globalisation. *Journal of Asian Economics 15 (2005) 1023--1050* .

Goyal, A., & Jha, A. K. (2004). Dictatorship, Democracy and Institutions: Macropolicy in China and India.

Government of India. (2010). *India 2010 - A Reference Annual.* Ministry of Information and Broadcasting, Research, Reference and Training Division. Additional Director General (Incharge), Publications Division.

GoI. (2006). Investment Strategy for India.

GOI. (2007). Meeting India's Infrastructure Needs with Public Private Partnerships - The International Experience and Perspective.

GoI. (2006). Public-Private Partnerships in National Highways.

GoI. (2000). Report of the Eleventh Finance Commission: From 2000-2005.

GoI. (2008). Restructuring of National Highways Authority of India.

Gomez-Ibanez, J. A. (2003). *Regulating Infrastructure Monopoly, Contracts, and Discretion.* Harvard University Press.

Gopalan, R., & Gormley, T. (2008). Stock Market Liberalization and the Decision to Go Public.

Gray, S. T., & Talbot, N. (2007). *Developing Financial Markets.* Centre of Central Banking Studies, Bank of England.

Greenbaum, S. I., & Thakor, A. V. (2007). *Contemporary Financial Intermediation Second Edition.* San Diego, California, USA: Elsevier Inc.

Greg, J. O., & MacGregor, T. (2003). *Democracy and Regulation: How the Public Can Govern Essential Services.* Pluto Press, London.

Griffith-Jones, S., & Fuzzo, A. T. (2004). Alternative Loan Guarantee Mechanisms and Project Finance for Infrastructure in Developing Countries.

Griffith-Jones, S., & Fuzzo, A. T. (2004). Alternative Loan Guarantee Mechanisms and Project Finance for Infrastructure in Developing Countries. *Institute of Development Studies, University of Sussex* .

Griffith-Jones, S., & Ocampo, J. A. (2002). What Progress on International Financial Reform? Why So Limited?

Grimsey, D., & Lewis, M. K. (2005). Are Public Private Partnerships value for money? Evaluating alternative approaches and comparing academic and practitioner views. *Accounting Forum , 29*, 345-378.

Grote, R., & Marauhn, T. (2006). *The Regulation of International Financial Markets.* Cambridge University Press, New York.

GTZ, for, F. M., & Development, G. International Fuel Prices 2007 - 5th Edition --- More than 170 Countries.

Iwamoto, Y. (2002). The Fiscal Investment and Loan Program in Transition (in Japan). *Journal of the Japanese and International Economies , 16*, 583-604.

Ichimura, S., & Bahl, R. (Eds.). (2009). *Decentralization Policies in Asian Development.* World Scientific Publishing Co. Pte. Ltd., Singapore.

ICRA. (2004). Refinancing of NHDP Annuity Projects---A Credit Perspective.

Investment, O. I. (2004). Opportunities And Policy Challenges for Investment in India.

India, E. o. (1999). Major Investment Opportunities in the Road Sector in India.

India: Committed to an Inclusive Financial Sector.

Indian Financial System.

Indian Financial System and Capital Market -- A Note.

Information, M. o., & Broadcasting, G. (2008). India 2008: A Reference Annual. *India 2008: A Reference Annual* .

Infrastructure, C. o. (2007). The Report of the Committee on Infrastructure Financing/Deepak Parekh Report.

Innovative Infrastructure Financing.

Imamura, T. (2002). Private Sector's Roles in Application of Private Finance Initiative to Highway Development in Japan. *Private Sector's Roles in Application of Private Finance Initiative to Highway Development in Japan* .

IMF. (2005). Public Investment and Fiscal Policy - Lessons from the Pilot Country Studies.

IMF. (2004). Public Investment and Fiscal Policy.

Ishimaru, K. (2002). *Privatization of Highway Public Corporations in Japan.* Massachusetts Institute of Technology, Department of Civil and Environmental Engineering.

Issues Concerning the Indian Bond Markets.

H., A. J. (1983). India in the international economy: from political to economic dependency. *Futures* .

Hahnel, R. (2002). *The ABC's of Political Economy: A Modern Approach.* Pluto Press, London.

Haldea, P., & Mohanty, P. (2003). Market-based financing for highways in India.

Hall, M. J. (2003). *The International Handbook on Financial Reform.* Edward Elgar Publishing Limited, UK.

Hall, P. A., & Soskice, D. (2001). An Introduction to Varieties of Capitalism. In *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage.* Oxford: Oxford University Press.

Hans, J. K., & Wobst, P. (2004). Institutions and Policies for Pro-poor Agricultural Growth. *Development Policy Review , 22*, 611-622.

Hanson, J. A., & Kathuria, S. India's Financial System: The Challenges of Reform.

Hanson,, J. A., & Majnoni, G. (Eds.). (2003). *Globalization and National Financial Systems.* World Bank and Oxford University Press, Washington.

Harris, C. (2008). India leads developing nations in private sector investment.

Harris, C. (2003). Private Participation in Infrastructure in Developing Countries - Trends, Impacts, and Policy Lessons. *World Bank Working Paper No. 5* .

Harris, C., & Tadimalla, S. K. (2008). Financing the boom in public-private partnerships in Indian infrastructure. *Public-Private Infrastructure Advisory Facility , noTE no. 45 -- DEc 2008*.

Heckelman, J. C., & Whaples, R. (2003). *PSOnline* . Retrieved 2010 йил August from www.apsanet.org

Heggie, I. G. (1999.). Commercially Managed Road Funds: Managing Roads Like a Business, Not Like a Bureaucracy. *Transportation , 26* (1), 87-111.

Heggie, I. G. (2000). Road Finance and Road Fund Management.

Heinz, W. (2005). Public Private Partnerships: Principles, Opportunities and Risks.

Hens, T., & Schenk-Hoppe, K. R. (Eds.). (2009). *Handbook of Financial Markets: Dynamics and Evolution.* North-Holland, Elsevier, Amsterdam.

Hemming, R. (2006). Public-Private Partnerships.

Heredia-Ortiz, E., & Rider, M. (2005). India's Intergovernmental Transfer System and the Fiscal Condition of the States.

Herd, R., & Leibfritz, W. (2008). *Fiscal Policy in India: past reforms and future challenges.* OECD Economics Department Working Papers, OECD, Economics Department.

Hertog, J. d. (1999). General Theories of Regulation.

Hillman, A. L. (2009). *Public Finance and Public Policy Responsibilities and Limitations of Government: Second Edition.* Cambridge, UK: Cambridge University Press.

Hobson, J. M. (2000). *The State and International Relations.* Cambridge University Press, New York.

Hodge, G. A., & Greve, C. (2007). Public -- Private Partnerships: An International Performance Review. *Public Administration Review , Essays on Service Delivery and Privatization*.

Hossain, A., & Chowdhury, A. (2000). Monetary and Financial Policies in Developing Countries. Routledge, London.

International Monetary Fund (2010), IMF Country Report No. 10/73, Washington, D.C. March

Jun, S. D. (2008). The Financial System Capacities of China and India.

Jayal, N. G. (2006). Representing India: Ethnic Diversity and the Governance of Public Institutions. Palgrave Macmillan Ltd., New York and UNRISD.

Jaarsma, C., & Dijk, T. v. (2002). Financing local rural road maintenance. Who should pay what share and why? *Transportation Research Part , A*, 507-524.

Jadhav, N. (2003). Capital Account Liberalisation: The Indian Experience.

Jadhav, N. (2005). *Financial Sector Reform and the Role of RBI.*

Jain, A. (n.d.). Privatizing infrastructural development in India, a dream turning into a reality? *Privatizing infrastructural development in India, a dream turning into a reality?*

Jain, S., & Bhanumurthy, N. (2005). Financial Markets Integration In India. *Asia-Pacific Development Journal , Vol. 12*.

Jenkins, R. (1999). *Democratic Politics and Economic Reform in India.* Cambridge University Press, New York.

Jennings, C., & Mclean, I. (2008). Political Economics and Normative Analysis. *New Political Economy , Vol. 13*, 62-75.

Jennings, C., & Mclean, I. (2008). Political Economics and Normative Analysis. *New Political Economy , 13* (1), 61 — 76.

Jha, R., & Longjam, I. S. (2006). Structure of financial savings during Indian economic reforms. *Empirical Economics , 31*, 861-869.

Johansson, M. (2007). *Deregulation and privatization in the Japanese financial sector and its effects on competition.* School of Business, Economics and Law Goteborg University.

John, N. K., & Ittyerah, N. (2004). The Crisis of Public Transport in India: Overwhelming Needs but Limited Resources. *Journal of Public Transportation , Vol. 7*, 1-20.

Joshi, V. (2003). India and the Impossible Trinity. *Blackwell Publishing* .

Kunal, A. G.-K., & Vaidya, R. R. (2003). *International Competetiveness, Investment, and Finance: A Case Study of India.* Routledge, London.

Kumar, D. (2005). Infrastructure in India.

Kumar, N. (2006). Reforms, global integration and economic development. *IPPR* .

K., A. S. (2007). On Financial Sector Reform in Emerging Markets: Enhancing Creditors' Rights and Securitizing Non-Performing Loans in the Indian Banking Sector---An Elephant's Tale. *Buffalo Law Review , 55*.

Kaul, I., & Conceicao, P. (Eds.). (2006). *The New Public Finance.* Oxford University Press, New York.

Kalidindi, S. N. (2006). Traffic revenue risk management through Annuity Model of PPP road projects in India. *International Journal of Project Management 24 (2006) 605--613 , 24, 605--613*.

Kalita, B. Post 1991 Banking Sector Reforms in India: Policies and Impacts.

Kanuk, A. R. (2007). *Capital Markets of India.* John Wiley & Sons, Inc., Hoboken, New Jersey.

Kanwar, S. (2004). Book Review: Economic Policy Reforms and the Indian Economy, Anne Krueger (ed.). *American Journal of Agricultural Economics , 86*, 288-292.

Kaneko, Y., & Metoki, M. (2008). Postal Savings for National Development--- The Experience of Japan and Future Perspective in a Globalized World. *Public Organization Review , 8*, 233-252.

Kant, S. (1999). Spatial Implications of India's New Economic Policy.

Kamat, M. S., & Kamat, M. M. Does Financial Growth lead Economic Performance in India?

Kapur, B. Developments and Opportunities in Infrastructure - Indian Scenario.

Kato, K. (2001). *Private Finance Initiative and Major Construction Firnas in Japan.* Massachusetts Institute of Technology.

Kerf, M. (1998). *Concession for Infrastructure: A Guide to Their Design and Award.* World Bank Technical Paper.

Ketkar, S. L., & Ratha, D. (2007). Development Finance via Diaspora Bonds.

Kiatchai, Y. M., & Saporito, C. (2008). *South Asian Bond Markets.* IBRD/World Bank.

Kindleberger, C. P. (2000). *Comparative Political Economy : A Retrospective.* The MIT Press, Cambridge.

King;, R. G. (1993). Finance and Growth: Schumpeter Might be Right. *The Quarterly Journal of Economics, Vol. 108, No. 3. (Aug., 1993), pp. 717-737.*

Kimura, F., & Maeda, M. (2005). Transport Infrastructure Development in Japan and Korea: Drawing Lessons for the Philippines.

Kirchner, C. (2007). Public Choice and New Institutional Economics. In P. B. Borck (Ed.), *Public Economics and Public Choice.* Springer-Verlag Berlin Heidelberg .

Khurana, R. Financing Infrastructure Projects.

Khan, M. S., & Kumar, M. S. (1997). Public and Private Investment and the Growth Process in Developing Countries. *Oxford Bulletin of Economic and Statistics , 59, 1.*

Khatri, Y., & Kochhar, K. (2002). India's Fiscal Situation in International Perspective.

Khemani, S. (2007). Does delegation of fiscal policy to an independent agency make a difference? Evidence from intergovernmental transfers in India. *Journal of Development Economics , 82*, 464-484.

Khemani, S. (2004). Political cycles in a developing economy: effect of elections in the Indian States. *Journal of Development Economics , 73*, 125-154.

Klein, D. B., & Majewski, J. America's Toll Roads Heritage: The Achievements of Private Initiative in the 19th Century.

Kletzer, K., & Kohli, R. (2001). Financial Repression and Exchange Rate Management in Developing Countries: Theory and Emperical Support from India.

Klingebiel, D., & Ruster, J. Why Infrastructure Facilities Often Fall Short of Their Objectives.

Kohli, A. (1989). Politics of Economic Liberalization in India. *World Development , Vol. 17*, pp. 305-328.

KPMG. (2006). *Public Private Participation in Indian Infrastructure: Poised for Growth.* A Background Note, KPMG, Infratructure Advisory Group.

Krueger, A. O. (1993). *Political Economy of Policy Reform in Developing Countries.* MIT Press, Cambridge.

Krugman, P. (2009). *The Return of Depression Economics and the Crisis of 20008.* W. W. Norton and Company Inc., New York.

Ludden, D. (Ed.). (1996). *Contesting the Nation: Religion, Community, and the Politics of Democracy in India.* University of Pennsylvania Press.

Luis, T. H., & Foster, V. (2008). *The Impact of Private Sector Participation in Infrastructure.* World Bank, Washington D.C.

L.Gupta, K. (1992). *Budget Deficits and Economic Activity in Asia.* Routledge, London.

Laurent, J. R., & Babiker, M. Modeling the Transport Sector: The Role of Existing Fuel Taxes in Climate Policy.

Lal, D. (1998). *Uninted Consequences: The Impact of Factor Endowments, Culture, and Politics on Long Run Economic Performance.* MIT Press, Cambridge.

Lal, D. (2008). An Indian Economic Miracle? *Cato Journal , Vol. 28*.

Lal, D. (1995). India and China: Contrasts in Economic Liberalization? *World Development , Vol. 23*, pp. 1475-1494.

Lal, D. (1985). Nationalism, Socialism and Planning: Influential Ideas in the South. *World Development , Vol. 13*, pp. 749-159.

Lal, D., & Myint, H. (1998). *The Political Economy of Poverty, Inequality, and Growth.* Clarendon Press, Oxford.

Lal, D., & Snape, R. H. (Eds.). (2001). *Trade, Development and Political Economy: Essays in Honour of Anne O. Krueger.* Palgrave Macmillan Ltd., New York.

Lal, S. (2006). *Can Good Economics Ever be Good Politics?* World Bank, Washington D.C.

Lall, S. V. (2006). Infrastructure and regional growth, growth dynamics and policy relevance for India. *Annals Regional Science , 41*, 581-599.

Lall, R., & Rastogi, A. (2007). The Political Economy of Infrastructure Development in Post-Independence.

Lane, P. R., & Schmukler, S. L. (2007). The Evolving Role of China and India in the Global Financial System. *Open Economic Review , 18*, 499-520.

Lane, P. R., & Schmukler, S. L. (2006). The International Financial Intregration of China and India.

Lars-Hendrik, O. C., & Stephan, A. (2002). Contribution to Productivity or Pork Barrel? The Two Faces of Infrastructure Investment.

Lewis, M. K. (2005). Are Public Private Partnerships value for money? Evaluating alternative approaches and comparing academic and practitioner views. *Accounting Forum 29 (2005) 345--378* .

Level, G. H. (2005). Corporate Bonds and Securitization.

Levinson, D. M. (2002). *Financing Transport Networks.* Edward Elgar Publishing Limited, UK.

Levinson, D. (2001). The Political Economy of Private Roads.

Levinson, D. (2006). *The Political Economy of Private Roads.* (G. Roth, Ed.) Street Smart : Competition, Entrepreneurship, and the Future of Roads, Transaction Publishers of Rutgers University.

Leight, J. (2008). Public Choice: A Critical Reassessment. *Government and Markets: Toward a New Theory of Regulation, Tobin Project Conference at White Oak, February 1-3, 2008.*

Li, M. (2007). Optimal Mixture of Road Network Ownership. *Optimal Mixture of Road Network Ownership* .

livemint.com. (2008 йил 4-August). From Live Mint - The Wall Street Journal: http://www.livemint.com/

Lieberman, I. W. (1998). *Privatization and Emerging Equity Markets.* World Bank.

Link, H. (2005). Transport accounts---methodological concepts and empirical results. *Journal of Transport Geography , 13*, 41-57.

Litan, R. E. (Ed.). (2004). *The Future of State-Owned Financial Institutions.* Brookings Institutions Press, Washington D.C.

Litan,, R. E., & Pomerleano, M. (Eds.). (2001). *Open Door: Foreign Participation in Financial Systems in Developing Countries.* The Brookings Institution, Washington.

Nayak, S. S. (2008). *Globalization and the Indian Economy: Roadmap to convertible rupee.* Routledge.

Nair, L. R. Capital account liberalization and stability of capital markets in India-an empirical analysis.

Nakanishi, Y. J. (2009). Vehicle and Road Automation - USA, EU and Japan. *Infrastructure and Service Automation , Part G*, 1165.

Nakhle, C. (2008). *Petroleum Taxation Sharing the oil wealth: a study of petroleum taxation yesterday, today and tomorrow.* Routledge, Oxon.

National, N. T. (2006). Trends in Infrastructure. *Connexions Quarterly News Letter , NOVEMBER 2006 VOL. 2 NO. 6*.

NCAER . (2006). *Trends in Infrastructure, Connexions Quarterly News Letter.* November 2006 Vol. 2 NO. 6, The National Council of Applied Economic Research.

Neave, E. H. (1998). *Financial Systems: Principles and Organisation.* Routledge, London.

Nienke, A. A., & Ueda, K. (2005). The Quality Effect: Does Financial Liberalization Improve the Allocation of Capital?

Nitzan, J., & Bichler, S. (2002). Capital Accumulation - Breaking the dualism of 'economics' and 'politics'. In R. Palan (Ed.), *Global Political Economy Contemporary Theories.* London: Routledge.

Mueller, D. C. (2003). *Public Choice III.* Cambridge, UK: Cambridge University Press.

Mukherjee, S., & Shori, T. (2008). *India Infrastructure and Construction.* Lehman Brothers Inc, New York.

Mukherji, R. (2008). The Political Economy of India's Economic Reforms. *Asian Economic Policy Review , 3*, 315-331.

Murty, K. N., & Soumya, A. (2006). Effects of Public Investment in Infrastructure on Growth and Poverty in India.

Murty, K. N., & Soumya, A. (2006). Macro economic effects of public investment in infrastructure in India.

Murty, K. N., & Soumya, A. (2006). Macro economic effects of public investment in infrastructure in India. *Indira Gandhi Institute of Development Research, Mumbai , Working Paper series No. WP-2006-003*.

Maira, A. (2004). *Remaking India.* Sage Publications, New Delhi.

Mahtaney, P. (2007). *India, China and Globalization.* Palgrave Macmillan Ltd., New York.

Majumdar, M. (1997). Book Review: India: Macroeconomics and Political Economy 1964-1991 Vijay Joshi. *Journal of Development Economics , Vol. 53*, 211-218.

Malik, Y., & Kapur, A. (2009). *Government and Politics in South Asia.* (Y. K. Malik, C. H. Kennedy, R. C. Oberst, A. Kapur, M. Lawoti, & S. Rahman, Eds.) Westview Press, Boulder, Colorado.

Manual, A. E., & Strong, J. (2000). The Long and Winding Path to Private Financing and Regulation of Toll Roads. *Policy Research Working Paper 2387, World Bank* .

Maskin, E., & Tirole, J. (2008). Public–Private Partnerships and Government Spending Limits. *International Journal of Industrial Organization , 26*, 412–420.

Marcos, P. M., & Okawa, Y. (2008). Mass car ownership in the emerging market giants. *Economic Policy April* , pp. 243--296.

Marjit, S. Financial Sector Reform for Stimulating Investment and Economic Growth - The Indian Experience.

Mathieu, N. (1998). *Financial Sector Reform: A Review of the World Bank Assistance OED Countries.* World Bank.

Matsui, Y. (1993). Feasibility of Privitization of Expressway in Japan. *Feasibility of Privitization of Expressway in Japan* .

McCartney, M. (2009). *India : The Political Economy of Growth, Stagnation and the State, 1951-2007 India in the Modern World.* Taylor and Francis Routledge, London.

McDonald, D. O. (Ed.). (2006). *Journal of Financial Regulation and Compliance* (Vol. Volume 14 Number 1).

McMullen, B. S. (Ed.). (2001). *Transportation after Deregulation.* Elsevier Science Ltd.

Mello, L. d. (2008). *Monetary policy and macroeconomic stability in Latin America: The cases of Brazil, Monetary Policies and Inflation Targeting in Emerging Economies.* OECD.

Menezes, F. A. (n.d.). Implications of Financial Liberalization in India. *Journal for International Affairs* .

Mizutani, F., & Uranishi, S. (2008). Privatization of the Japan Highway Public Corporation: Focusing on Organizational Structure Change. *Transport Reviews , 28*, 469 --- 493.

Mizutani, F., & Uranishi, S. (2006). Privatization of the Japan Highway Public Corporation: Policy Assessment.

Michael, F. A., & Maddaloni, A. (2004). Financial Systems in Europe, The USA, and Asia. *Oxford Review of Economic Policy, Volume 20, Number 4, 2004, pp. 490-508* .

Milan, K. M. (1996). India in the Global Economy.

Minsky, H. P. (2008). *Stabilizing an Unstable Economy.* New York: McGraw-Hill.

Mishkin, F. S. (2004). *The Economics of Money, Banking and Financial Markets* (Seventh Edition ed.). Pearson Addison-Wesley.

Mishkin, F. S. (2007). *The Next Great Globalization.* Princeton University Press, Princeton.

Misra, B. S. (2007). *Regional Growth Dynamics in India in the Post-Economic Reform Period.* Palgrave Macmillan Ltd., New York.

Mitra, S. K. (1996). Book Review: India's Political Economy: Governance and Reform, by John P. Lewis. *Journal of Development Economics , Vol. 53*, 479-484.

Mitra, S. K. (2006). *The Puzzle of India's Governance: Culture, Context and Comparative Theory.* Routledge, London.

Mody, A. (1996). *Infrastructure Delivery: Private Initiative and the Public Good.* World Bank, Economic Development Institute (EDI). World Bank, Washington D.C.

Mody, A., & Walton, M. (1998). Building on East Asia's Infrastructure Foundations.

MOF. (2001). Japan Highway Public Corporation (JHPC).

Mohan, R. (2006). Economic Reforms in India: Where are We and Where do We Go?

Mohan, R. (2006). Financial Sector Reforms and Monetary Policy: The Indian Experience.

Mohan, R. (2008). The Role of Fiscal and Monetary Policies in Sustaining Growth With Stability in India. *Asian Economic Policy Review , 3*, 209-236.

Mohan, T. R. Privatization in India: Issues and Evidence.

Montiel, P. J. (2003). *Macroeconomics in Emerging Markets.* Cambridge University Press, New York.

Moore, T. (2007). *India's Emerging Financial Market: A flow of funds model.* Routledge, Oxon.

MoSRTH. (2008). *MoSTRH Notification .* Ministry of Road Transport and Highways, Department of Road Transport and Highways. Gazette of India - Extraordinary.

Mor, N., & Sehrawat, S. (2006). Sources of Infrastructure Finance. *Centre for Development Finance Working Paper Series* .

Mori, M. (1999). Getting Around in Japan: The Status and Challenges of ITS. *Public Roads , Vol. 62*.

Morisugi, H. (2000). Evaluation methodologies of transportation projects in Japan. *Transport Policy , 7*, 35-40.

Oura, H. (2008). Financial Development and Growth in India: A Growing Tiger in a Cage?

Oberst, R. C., & Rahman, S. (2009). *Government and Politics in South Asia.* Westview Press, Boulder, Colorado.

Ocampo, J. A. (1999). International financial reform: the broad agenda.

Ocampo, J. A., & Stiglitz, J. E. (2008). *Capital Market Liberalization and Development.* Oxford University Press, New York.

OECD. (2007). *OECD Economic Survey of India 2007, by Angel Gurría, .* OECD, OECD Secretary-General, New Delhi.

OECD. (2000). Public Finance of the Highway Sector.

OECD. (2008). Public-Private Partnerships.

OECD/ITF. (2008). Transport Infrastructure Investment: Options for Efficiency.

Oetzel, J. M., & Ranganathan,àó, R. (2006). Private Provision of Infrastructure in Emerging Markets: Do Institutions Matter? *Development Policy Review , 24 (2): 175-202*.

Odecka, J., & Brathenb, S. (2002). Toll financing in Norway: The success, the failures and perspectives for the future. *Transport Policy , 9*, 253-260.

of, U. E. (1999). India - Economic News.

of, G. M. (2007). Meeting India's Infrastructure Needs with Public Private Partnerships The International Experience and Perspective.

Omori, S. (2007). Exploring political determinants of the magnitude of financial reforms in developing countries. *International Relations of the Asia-Pacific Volume 7 (2007) 251 -- 275* .

Options for Private Financing of Roads.

Public Finance of the Highway Sector.

Paulet, E. (Ed.). (2009). *Financial Markets and the Banking Sector: Roles and Responsibilities ina Global World.* Pickering and Chattto, London.

Palan, R. (Ed.). (2000). *Global Political Economy: Comparative Theories.* Routledge, London.

Palma, A. d., & Lindsey, R. (2007). Transport User Charges and Cost Recovery. *Research in Transportation Economics, , Volume 19*, 29-57.

Panagariya, A. (2007). Why India Lags Behind China and How It Can Bridge the Gap. *The World Economy* .

Panagariya, A. (2003). India in the 1980s and 1990s: A Triumph of Reforms.

Panagariya, A. (2008). *India: The Emerging Giant.* Oxford University Press, Oxford.

Pandey, N. (2009). Emerging Challenges and Opportunities in Construction Sector. *Construction Journal of India - April 2009* .

Pankaj, D. A. (2009). Indian Economic Outlook 2008-09 and 2009-10.

Parikh, J. K. (1999). Transport sector in India: an analysis in the context of sustainable development. *Transport Policy 6 (1999) 35 -- 45* .

Parke, C. &. (2006). Toll Road Update ---.

Parker, K., & kastner, S. (1993). A Framework for Assessing Fiscal Sustainability and External Viability, with an Application to India.

Parry, I. W. Paying Too Much for Petrol. *Regulation , Volume 23*.

Partners, T., & Coalition, G. B. Legislative and Institutional Framework for Public-Private Partnerships in India.

Patil, R. Broadbasing and Deepening the Bond Market in India.

Patrick, G. C. (Ed.). (2002). *Financial Sector Policy for Developing Countries: A Reader.* World Bank and Oxford University Press, Washington.

Pedersen, J. D. (2000). Explaining Economic Liberalization in India: State and Society Perspectives. *World Development , Vol. 28*, pp. 265-282.

Pedersen, J. D. (2008). *Globalization, Development and the State: The Performance of India and Brazil since 1990.* Palgrave Macmillan Ltd., New York.

Persson, T., & Tabellini, G. (Eds.). (1995). *Monetary and Fiscal Poilcy* (Vols. Vol. 1, Credibility). The MIT Press, Cambridge.

Persson, T., & Tabellini, G. (2000). *Political Economics: Explaining Economic Policy.* The MIT Press, Cambridge.

Peter, S. F., & Thorat, S. (2000). Government Spending, Growth and Povery In Rural India. *American Journal of Agricultural Economics , 82*, 1038-1051.

Petersen, E. (2002). A highway corridor planning model: QROAD. *Transportation Research Part A 36 (2002) 10 -125* .

Petrazzini, B. A. (1996). Telecommunications Policy in India: The Political Underpinnings of Reform. *Telecommunications Policy , Vol, 20*, pp. 39-51.

Pfeffer, M. (2001). *Toll Road Demand Forecasting -- A Dual-Criteria Assignment Model.* Cranfield University.

Pinto, B., & Zahir, F. (2004). *India : why fiscal adjustment now.* Policy Research Working Paper Series, The World Bank.

Pittman, R. Vertical Restructuring of the Infrastructure Sectors of Transition Economies.

Philippe, S. R., & Zilibotti, F. (2007). The Unequal Effects of Liberalization: Evidence from Dismantling the License Raj in India.

Poirson, H. K. (2007). Financial Market Implications of India's Pension Reform.

Postigo, A. (2008). Financing road infrastructure in China and India: current trends and future options. *Journal of Asian Public Policy , Vol. 1*, 71-89.

PPIAF. (2008). Private activity in transport continued at peak levels for second year.

Pradhan, H. K. India: Local Government Finance and Bond Markets.

Prasad, E. S., & Rajan, R. G. (2008). Next Generation Financial Reforms for India.

PRICE, R. B. (n.d.). Ideology and Indian Planning. *The American foumal of Eeottomcs and Sociology* .

PricewaterhouseCoopers. (2008). *Infrastructure in India: A vast land of construction opportunity.* PricewaterhouseCoopers.

Prithvi, P. M. (2003). Market-based financing for highways in India.

Subramanian, A. (2007). The evolution of institutions in India and its relationship with economic growth. *Oxford Review of Economic Policy, Volume 23, Number 2, 2007, pp.196 -- 220* .

Subramanian, D. (2008). How Far Has Indian Industry Travelled down the Deregulatory Road?

Sudeshna, R. R. (n.d.). Private Provision of Infrastructure in Emerging Markets: Do Institutions Matter? *World Bank Working Paper* .

Sugawara, Y. (2007). Understanding the Differences in the Development and Use of Advanced Traveler Information Systems for Vehicles (ATIS/V) in the U.S., Germany, and Japan. *Understanding the Differences in the Development and Use of Advanced Traveler Information Systems for Vehicles (ATIS/V) in the U.S., Germany, and Japan* .

Susan, A. S., & Gorham, M. (2008). *India's Financial Markets.* Elsevier Ltd. Oxford, UK.

S., J. K., & Vos, R. (Eds.). (2007). *Growth Divergences.* Zed Book, London, Orient Longman Private Limited, Hyderabad, Third World Network Penang, in association with the United Nations.

S{\'a}ez, L. (2004). *Banking Reform in India and China.* Palgrave Macmillan, New York.

Swafford, P. M., & Yellepeddi, S. (2009). Emerging Economies: Operational Issues in China and India. *Journal of Marketing Channels , 16*, 169-187.

Swaroop, V. (1994). The Public Finance of Infrastructure: Issues and Options. *World Development, Vol. 22, No. 12, pp. 1909-1919, 1994* .

Savas, E. S. (2000). *Privatization and Public-Private Partnerships.* Seven Bridges Press.

Sachs, J. D., & Bajpai, N. (February 2001). The Decade of Development: Goal Setting and Policy Challenges in India. *CID Working Paper No. 62* .

Sally, R. (2007). India and Globalisation. *Journal compilation {\copyright} Institute of Economic Affairs 2007. Published by Blackwell Publishing, Oxford* .

Sapat, A. (1999). Privatization Strategies Adopted For Public Sector Reform in India: Determinants and Constraints. *Policy Studies Review, Summer 1999, 16:2* .

Sarangi, D. (2002). Infrastructure Development: a public-private partnership in India. *UNESCO* .

Sarkar, S., & Sarkar, T. Reforming the financial markets in India: a strategic approach.

Sarma, M., & Nikaido, Y. (2007). Capital Adequacy Regime in India: An Overview.

Sato, M., & (eds), Y. S. (2005). Tax policy and reform in Asian countries: Introduction. *Journal of Asian Economics , 16*, 907-909.

Schuitema, G., & Steg, L. (2008). The role of revenue use in the acceptability of transport pricing policies. *Transportation Research Part F , 11*, 221-231.

Schelkle, W. (1994). *Constitution and Erosion of a Monetary Economy: Problems of India's Development since Independence.* Frank Cass, London in Association with German Development Institute, Berlin.

Schich, S. (2007). Indian Financial System Reform: Selected Issues. *Financial Market Trends, OECD , Vol. 2007/2*.

Seabrooke, L. (2007). Varieties of economic constructivism in political economy: Uncertain times call for disparate measures. *Review of International Political Economy , 14*, 371-385.

SEBI. (2009). *Annual Report 2008 - 2009.* Securities and Exchange Board of India. Mumbai: http://www.sebi.gov.in.

Secretariat, U. E., & Council, S. (2006). Financing of Transport Infrastructure and Public-Private Partnerships.

Sen, P. (2007). Capital inflows, financial repression, and macroeconomic policy in India since the reforms. *Oxford Review of Economic Policy, Volume 23, Number 2, pp.292 -- 310* .

Seth, V. K. (1986). State and spatial aspects of industrialization in post-Independence India. *Political Geography Quarterly , Vol. 5*, 331-350.

Sethi, N. (n.d.). International Capital Flows and the Growth in India: The Recent Experience. *International Capital Flows and the Growth in India: The Recent Experience* .

Siddiqui, A. (Ed.). (2007). *India and South Asia.* M.E. Sharpe, New York.

Singh, A. (1997). Financial Liberalisation, Stockmarkets and Economic Development. *The Economic Journal, Vol. 107, No. 442. (May, 1997), pp. 771-782.*

Singh, D. (2006 йил November). Connexions. *Quarterly Newsletter On NCAER-CEPR-IDEI-ECARES ECCP Project* , 2* (6).

Singh, K., & Berry, S. (2006). India's and China's Recent Experience with Reform and Growth. In W. T. Cowen (Ed.), *India's Growth Experience.* International Monetary Fund.

Singh, L. B., & Kalidindi, S. N. (2006). Traffic revenue risk management through Annuity Model of PPP road projects in India. *International Journal of Project Management , 24*, 605--613.

Singh, N. (2006). Essays on Indian Economic Policy and Institutional Reform.

Singh, N. (2002). Miracles and Reform in India - Policy Reflections. *ASIAN SURVEY, Vol. XLII, No. 5, September/October 2002* .

Singh, N., & Wallack, J. S. (2005). Moving India: Policies and Priorities in Transport Sector Reform.

Singh, N., & Vasishtha, G. (2004). Some Patterns in Center-State Fiscal Transfers in India: An Illustrative Analysis.

Singh, N., & Srinivasan, T. N. (2004). Fiscal Policy in India: Lessons and Priorities.

Singh, N., & Srinivasan, T. N. (2004). Foreign Capital, Inflation, Sterilization, Crowding-Out and Growth: Some Illustrative Models.

Singh, N., & Srinivasan, T. N. (2002). Indian Federalism, Economic Reform and Globalization.

Singh, T. (2008). Financial development and economic growth nexus: a time-series evidence from India. *Applied Economics , 40*, 1615 --- 1627.

Singhal, R. (2004). Financial Sector Reform in India: Is There a Grand Design? *Occasional Paper Number 16, Center for the Advanced Study of India, Philadelphia, .*

Sinha, N. (1996). The Political Economy of India's Telecommunication Reforms. *Telecommunications Policy, , Vol. 20*, pp. 23-38.

Shah, A., Thomas, S., & Gorham, M. (2008). *India's Financial Markets.* Oxford, UK: Elsevier Ltd. .

Sharma, A. (2008). Incomplete reform or opportunity: the role of the banking sector in the credit transmission mechanism in India. *Journal of Economic Policy Reform , Vol. 11*, 273-288.

Shepherd, S. P., & Pfaffenbichler, P. (2006). Sustainable transport policies under scarcity of oil supply.

Shirai, S. (2004). Impact on Financial and Capital Market Reforms on Corporate Finance In India. *Asia-Pacific Development Journal , Vol. 11.*

Smith, Z. (2000). The Petrol Tax Debate.

Smith, W., & Hallward-Driemeier, M. (2005). Understanding the Investment Climate.

Sophastienphong, K., & Kulathunga, A. (2009). *Getting Finance in South Asia 2009.* World Bank, Washington D.C.

Sridhar, V. (2002). Securitization in India -- Opportunities & Obstacles.

Srinivasan, T. (1996). Economic Liberalization and Economic Development: India. *Journal of Asian Economics , Vol. 7*, pp. 203-216.

Srinivasan, T. India's Economic Growth and Global Integration: Experience since Reforms and Future Challenges.

Studart, R. (1995). *Investment Finance in Economic Development.* Taylor and Francis Routledge, London.

Steven, J. A., & Prasad, E. (Eds.). (2006). *China and India, Learning from Each Other: Reforms and Poilcies for Sustained Growth.* IMF, Washington D.C.

Stein, H. (2008). *Beyond the World Bank Agenda: An Institutoinal Approach to Development.* The University of Chicago Press.

Straub, S. (2008). *Infrastructure and growth in developing countries : recent advances and research challenges.* Policy Research Working Paper Series, The World Bank.

Rubin, I. S. (2000). *The Politics of Public Budgeting: Getting and Spending, Borrowing and Balancing.* Chatham House Publishers, New York.

R., A. N. (2007). Capital Account Convertibility and Risk Management in India.

Ragazzi, G., & Rothengatter, W. (Eds.). (2005). Procurement and Financing of Motorways in Europe. *Procurement and Financing of Motorways in Europe , 15* . Elsevier Ltd. Oxford, UK.

Raghuram, G., & Kheskani, D. (2000). Government's Role in Road Toll Collection: The Coimbatore Bypass Experience1.

Rajan, P. R. (2004). Is India's public finance unsustainable? Or, are the claims exaggerated? *Journal of Policy Modeling 26 (2004) 401--420* .

Rajan, R. G., & Zingales, L. (2001). Financial Systems, Industrial Structure, and Growth. *Oxford Review of Economic Policy, Volume 17, Number 4, 2001, pp. 467* .

Rajan, R. S. (2003). *Economic Globalization and Asia: Essays on Finance, Trade and Taxation.* World Scientific Publishing Co. Pte. Ltd., Singapore.

Rajan, R. S., & Rongala, S. (2008). *Asia in the Global Economy.* World Scientific Publishing Co. Pte. Ltd., Singapore.

Rajaraman, I. (n.d.). Fiscal Developments and Outlook in India.

Rajaraman, I. (2008). The Political Economy of the Indian Fiscal Federation.

Raje, P. (2000). Where did India miss a turn in banking reform? Is there a comeback?

Rakshit, M. (2004). Comments on "Fiscal Developments and Outlook in India" by Indira Rajaraman and "Macroeconomic Implications of the Fiscal Imbalances" by Kalpana Kochhar.

Ram, T. T. (2005). *Privatisation in India: Challenging economic orthodoxy.* RoutledgeCurzon, London.

Ramakrishnan, R. (2002). Intricacies in Privatisation of Road Development.

Ramanathan, R., & Parikh, J. K. (1999). Transport sector in India: an analysis in the context of sustainable development. *Transport Policy , 6*, 35-45.

Ramamurti, R. (2003). Can governments make credible promises? Insights from infrastructure projects in emerging economies. *Journal of International Management 9 (2003) 253 -- 269* .

Ramamurti, R., & Vernon, R. (Eds.). (1991). *Privatization and Control of State-owned Enterprises EDI Development Studies.* World Bank, Washington D.C.

Ramamurtia, R., & Dohb, J. P. (2004). Rethinking foreign infrastructure investment in developing countries. *Journal of World Business , 39*, 151-167.

Ramirez, M. T. (2003). Institutions, infrastructure, and economic growth. *Journal of Development Economics 70 (2003) 443 -- 477* .

Rao, K. (2006). India offers investor bait.

Rao, M. G. (2005). Tax system reform in India: Achievements and challenges ahead{\S}. *Journal of Asian Economics , 16*, 993-1011.

Rao, M. G., & Singh, N. (2006). The Political Economy of India's Fiscal Federal System and its Reform. *The Journal of Federalism volume 37 number 1, pp. 26-44* .

Rao, S. C., & Sapale, V. (2008). Benefits for Infrastructure Sector announced in the Union Budget from 1991-92 to 2007-08.

Rastogi, A. (2007). The Infrastructure Sector in India 2007.

RBI. *Handbook of Statistics on the Indian Economy.* Reserve Bank of India. http://www.rbi.org.in/scripts/AnnualPublications.aspx?head=Handbook%20of%20Statistics%20on%20Indian%20Economy.

RBI. (2009). *Macroeconomic and Monetary Developments in 2008-09.* Reserve Bank of India.Mumbai: http://www.rbi.org.in/scripts/AnnualPublications.aspx?head=Macroeconomic%20and%20Monetary%20Developments.

Reddy, Y. V. (2001). Operationalising Capital Account Liberalisation: The Indian Experience. *Development Policy Review , 19 (1): 83-99.*

Reddy, C. R. (2002). India, the Washington Consensus and the East Asian Crisis. *UNESCO* .

Reforming Infrastructure. (2009). World Bank.

(2007). Report and Recommendations of the Committee on 'Launch of Dedicated Infrastructure Funds (DIF's) by Mutual Funds'.

Research, D. B. (2005). China & India: A visual essay.

Ricardo, S. S., & Nayyar, D. (2006). *Stability with Growth.* Oxford University Press, Oxford.

Richard, B. A., & Schwartz, G. (2007). Public Investment and Public-Private Partnerships. *International Monetary Fund* .

Rienstra, S. A. (1995). Private sector involvement in financing and operating transport infrastructure. *Annals Regional Science (1995) 29:221-235* .

Rienstra, S. A. (1995). Private sector involvement in financing and operating transport infrastructure. *The Annals of Regional Science , 29*, 221-235.

Rietveld, P., & Woudenberg, S. v. (2005). Why fuel prices differ. *Energy Economics , 27*.

Roubini, N., & Hemming, R. (2004). A Balance Sheet Crisis in India?

Roy, J. M.-V., & Rider, M. (2005). India: Fiscal Condition of the States, International Experience, and Options for Reform.

Robaschik, F., & Yoshino, N. (2000). Public Banking in Germany and Japan's Fiscal Investment and Loan Program: A Comparison. *Duisburger Arbeitspapiere Zur Ostasienwirtschaft* .

Rodden, J., & Wilkinson, S. (2004). The Shifting Political Economy of Redistribution in the Indian Federation.

Rodrigues, J. R., & Junior, G. B. (2005). Fiscal Space and Public Sector Investments in Infrastructure: A Brazilian Case-Study.

Rodrik, D., & Subramanian, A. (2004). From "Hindu Growth" to Productivity Surge: The Mystery of the Indian Growth Transition.

Roger, N. (1999). Recent Trends in Private Participation in Infrastructure.

Rogozinski, J., & Landa, R. T. Private Infrastructure Concessions: The 1989-1994 National Highway Program in Mexico.

Romp, W., & deHaan, J. (2007). Public Capital and Economic Growth: A Critical Survey. *Perspektiven der Wirtschaftspolitik, University of Groningen , 8 (Special Issue)*, 6-52.

Rose-Ackerman, S., & Rossi, J. (1999). Takings Law and Infrastructure Investment: Certainty, Flexibility and Compensation.

Roth, G. (2005). Liberating the Roads Reforming U.S. Highway Policy.

Rothermund, D. (1993). *An Economic Histroy of India: From Pre-Colonial Times to 1991* (Second Edition ed.). Routledge, London.

Tarun, P. D., & P., V. M. (2001). Road Sector in India. *Road Sector in India* .

Tarapore, S. (2000). The Malaise of the Indian Financial System: The Need for Reforms.

Teisman, G. R. (2008). Infrastructure Investments on the Edge of Public and Private Domains. In W. D. G. Arts, & L. H. (eds.) (Eds.), *New Perspectives on Investment in Infrastructures.* Amsterdam: Scientific Council for Government Policy (WRR), Amsterdam University Press.

Thakur, R. A. Infrastructure Financing: Betting Big on India.

Thirlwell, M. (2006). Roaring tiger or lumbering elephant? *Lowy Institute For International Policy* .

Thomas, A., & Mohan, G. (Eds.). (2007). *Research Skills for Policy and Development.* London: The Open University in association with Sage Publications.

Touffut, J.-P. (Ed.). (2006). *Advancing Public Goods.* Edward Elgar Publishing Limited, UK.

Vuyyuri, S. (2004). Linkages of Indian Interest Rates with US and Japanese Rates. *Applied Econometrics and International Development. AEEADE , Vol. 4.*

V., J. M. (2004). *Comparative Economics in a Transforming World Economy* (Second Edition ed.). The MIT Press, Cambridge.

Varma, A., & Sinha, K. C. (1990). On User Charges for Highway Financing. *Transportation Research , Vol. 24A*, pp. 293-102.

Varma, J. (2001). Regulatory Dilemmas in Infrasatructure Financing.

Vinaya, S. J., & Rajkumar, A. S. (2000). Fiscal effects of foreign aid in a federal system of governance: The case of India. *Journal of Public Economics , 77*, 307-330.

Virmani, A. (2004). Economic Reforms: Policy and Institutions.

(2010). From Government of Tamil Nadu - Highways Dapartment: http://www.tnhighways.org/

Wyatt, A., & Zavos, J. (Eds.). (2003). *Decentring the Indian Nation.* Frank Cass, London.

Wadhva, C. D. (n.d.). India Trying to Liberalise: Economic Reforms Since 1991. 259-284.

Walton, C. M., & Euritt, M. A. (1990). Highway Finance and the Private Sector: Issues and Alternatives. *Transportation Research Part A 36 (2002) 10 -125 , 24A*, 265-276.

Wang, P. (2009). *The Economics of Foreign Exchange and Global Finance.* Springer-Verlag Berlin Heidelberg.

Watanabe, M. (Ed.). (2006). *Recovering Financial Systems China and Asian Transition Economies.* Palgrave Macmillan, New York.

Weingast, B. R. (2009). Second generation fiscal federalism: The implications of fiscal incentives. *Journal of Urban Economics , 65*, 279-293.

Winpenny, J. (2005). *Guaranteeing Development? The Impact of Financial Guarantees.* Development Centre, OECD.

World Bank. (1994). *World Development Report 1994 .* World Bank. New York: Oxford University Press.

World Bank. (2005). *Financial Sector Assessment: A Handbook.* IBRD/World Bank, Washington.

World Bank. (2006). India Building Capacities for Public Private Partnerships.

World Bank. (2004). *India Highway Financing.* Report No. 30363-IN, World Bank.

World Bank. (2006). *Handbook for Evaluating Infrastructure Regulatory Systems.* (A. C. Brown, J. Stern, B. Tenenbaum, & D. Gencer, Eds.) The International Bank for Reconstruction and Development / The World Bank.

World Bank. (2007). *Managing Public Debt: From Diagnostics to Reform Implementation.* The International Bank for Reconstruction and Development / The World Bank.

World Bank (1994), World Development Report 1994 : Infrastructure for Development, World Bank and Oxford University Press, 1994

World Bank. (1996). *Sustainable Transport: Priorities for Policy Reform.* World Bank, Washington D.C.

World Bank. (2001.). *Toll roads and concessions*. (W. D. The World Bank Group, Producer) From Roads and Highways Home, Transport Home: http://www.worldbank.org/transport/roads/toll_rds.htm.

World Bank (2006), India Financing Infrastructure: Addressing Constraints and Challenges, Finance and Private Sector, Development Unit South Asia Region, June 2006

World Bank (2009), Report No: 42132 IN, Project Appraisal Document on a Loan to the India Infrastructure Finance Company Limited (IIFCL) with a Gaurantee of the Republic of India for a Project on Financing PPP in Infrastructure Through Support to the IIFCL, August 27, 2009

Yuan, C. (2003). Financial System Reform and Economic Development. *Financial System Reform and Economic Development* .

Young, A. (2001). *The Politics of Regulation: Privatized Utilities in Britain.* Palgrave, New York.

Yoshiro, H. K., & Yamamura, E. (1986). Theoretical Criteria for the Expressway Toll-Pooling System in Japan. *Journal of the Graduate School of Environmental Science , http://hdl.handle.net/2115/37186*.

Zachariadis, T. (2006). On the baseline evolution of automobile fuel economy in Europe. *Energy Policy , 34*, 1773-1785.

Zhang, P. G., & Jian, Y. Indian Financial Sector Reform and Experience: Lessons for the People's Republic of China.

Websites and Online Resources:

www.livemint.com
www.financialexpress.com
www.economictimes.indiatimes.com
www.business-standard.com
www.rbi.org.in
www.ppi.worldbank.org
http://www.nhai.org
http://ibef.org
http://morth.nic.in
http://indiabudget.nic.in
http://www.tcil.com
http://www.thehindu.com

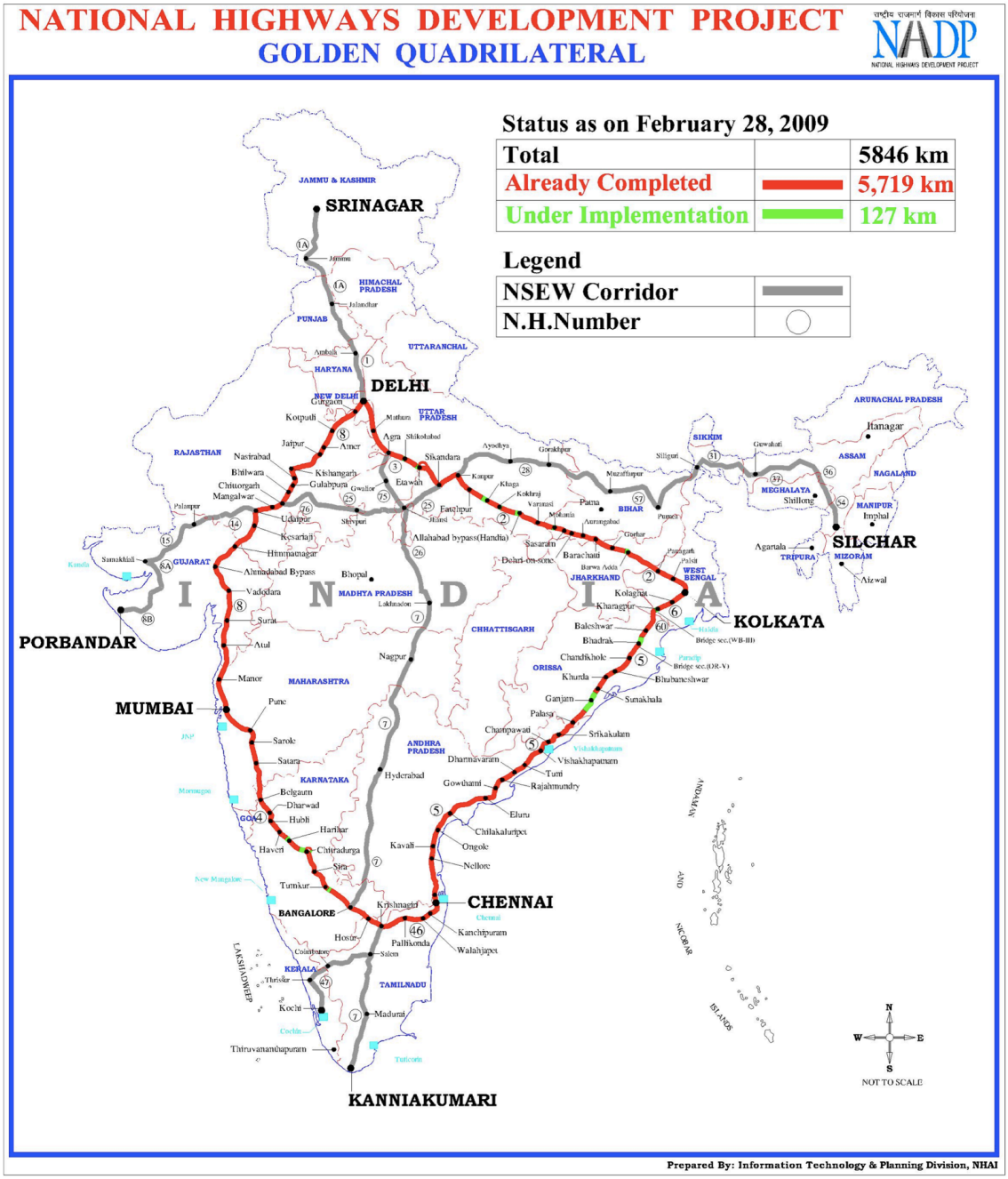
LIST OF APPENDICES

APPENDIX 1 WORLD BANK: LITTLE DATA BOOK ON PRIVATE SECTOR DEVELOPMENT (2009)

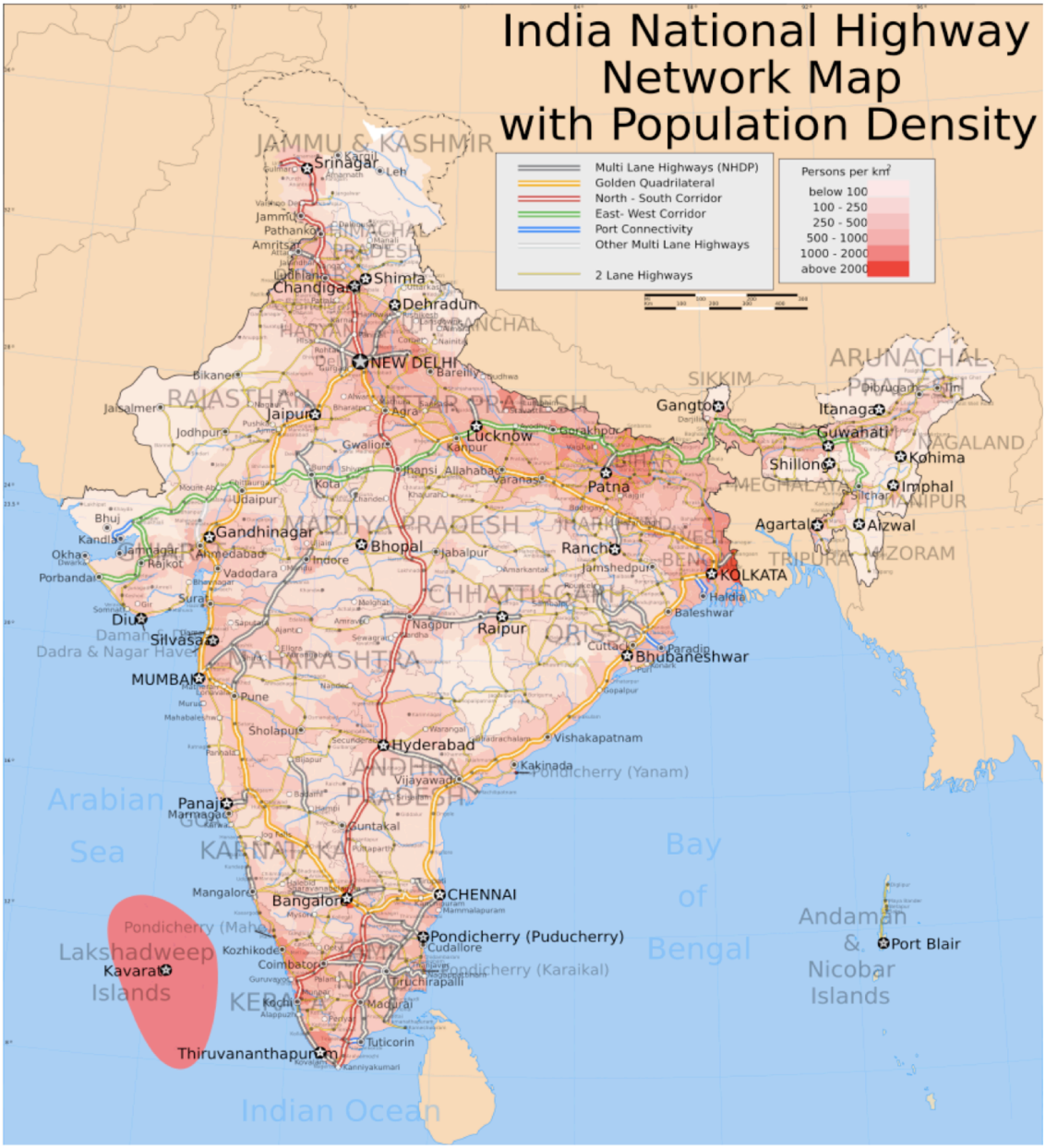
World Bank: Little Data Book on Private Sector Development (2009)

South Asia	Lower middle income		
	Country data		Lower middle-income group
	2000	2007	2007
Economic and social context			
Population (millions)	1,015.9	1,124.8	3,435
Labor force (millions)	391.7	447.7	1,662
Unemployment rate (% of labor force)	4.3	*5.0*	*5.7*
GNI per capita, *World Bank Atlas* method ($)	450	950	1,905
GDP growth, 1995–2000 and 2000–07 (average annual %)	5.9	7.8	8.0
Agriculture value added (% of GDP)	23.4	18.1	12.6
Industry value added (% of GDP)	26.2	29.5	41.3
Manufacturing value added (% of GDP)	15.6	16.3	*24.9*
Services value added (% of GDP)	50.5	52.4	46.1
Inflation (annual % change in consumer price index)	4.0	6.4	
Exchange rate (local currency units per $)	44.9	41.3	
Exports of goods and services (% of GDP)	13.2	21.3	37.0
Imports of goods and services (% of GDP)	14.2	24.4	33.1
Business environment			
Ease of doing business index (ranking 1–181; 1 = best)	..	122	
Time to start a business (days)	..	30	35
Procedures to start a business (number)	..	13	9
Firing cost (weeks of wages)	..	56.0	52.0
Closing a business (years to resolve insolvency)	..	10.0	3.5
Total tax rate (% of profit)	..	71.5	42.9
Highest marginal tax rate, corporate (%)	40	30	
Business entry rate (new registrations as % of total)	*3.7*	*2.7*	8.6
New business density (new regis. per working-age pop.)	*0.0*	*0.0*	1.0
Enterprise surveys			
Time dealing with gov't officials (% of management time)	*12.9*	*6.7*	
Firms expected to give gifts in meetings w/tax officials (%)	..	*52.3*	
Firms using banks to finance investments (% of firms)	*0.0*	*19.4*	
Delay in obtaining an electrical connection (days)	*72.6*	*29.5*	
ISO certification ownership (% of firms)	..	*22.5*	
Private sector investment			
Invest. in infrastructure w/private participation ($ millions)	2,665	22,485	67,651
Private foreign direct investment, net (% of GDP)	0.8	2.0	3.5
Gross fixed capital formation (% of GDP)	22.7	34.0	33.2
Gross fixed private capital formation (% of GDP)	16.3	25.7	*13.6*
Finance and banking			
Government cash surplus or deficit (% of GDP)	–3.9	–1.4	*–1.1*
Government debt (% of GDP)	56.0	53.7	..
Deposit money banks' assets (% of GDP)	41.1	60.9	81.4
Total financial system deposits (% of GDP)	42.6	57.5	46.4
Bank capital to asset ratio (%)	5.7	6.4	9.5
Bank nonperforming loans to total gross loans ratio (%)	12.8	2.5	3.9
Domestic credit to the private sector (% of GDP)	28.8	47.3	74.7
Real interest rate (%)	8.5	7.8	
Interest rate spread (percentage points)	..	..	7.3
Infrastructure			
Paved roads (% of total roads)	47.5	..	*39.0*
Electric power consumption (kWh per capita)	402	*503*	*1,269*
Power outages (number in typical month)	..	..	
Mobile cellular subscriptions (per 100 people)	0.4	20.8	38.9
Internet users (per 100 people)	0.5	7.2	12.4

APPENDIX 2 NATIONAL HIGHWAYS DEVELOPMENT PROJECT GOLDEN QUADRILATERAL (Source NHAI)



APPENDIX 3 INDIAN NATIONAL HIGHWAY NETWORK MAP WITH POPULATION DENSITY



APPENDIX 4 DETAILS OF THE SEVEN PHASES OF NHDP

Details of the Seven Phases of NHDP

* Phase I: The Golden Quadrilateral (GQ; 5,846 km) connecting the four major cities of Delhi, Mumbai, Chennai and Kolkata. This project connecting four metro cities, would be 5,846 km. Total cost of the project is Rs300 billion (US$6.8 billion), funded largely by the government's special petroleum product tax revenues and government borrowing. As of January 2009 5,704 km of the intended 5,846 km has been 4 laned.

* Phase II: North-South and East-West corridors comprising national highways connecting four extreme points of the country. The North-South and East-West Corridor (NS-EW; 7,300 km) connecting Srinagar in the north to Kanyakumari in the south, including spur from Salem to Kochi (Via Coimbatore), and Silchar in the east to Porbandar in the west. Total length of the network is 7,300 km. As of january 2009, 42% of the project had been completed and 44% of the project work is currently at progress.[2] It also includes Port connectivity and other projects — 1,157 km. The final completion date to February 28, 2009 at a cost of Rs350 billion (US$8 billion), with funding similar to Phase I.

* Phase III: The government recently approved NHDP-III to upgrade 12,109 km of national highways on a Build, Operate and Transfer (BOT) basis, which takes into account high-density traffic, connectivity of state capitals via NHDP Phase I and II, and connectivity to centres of economic importance. contracts have been awarded for a 2,075 km.

* Phase IV: The government is considering widening 20,000 km of highway that were not part of Phase I, II, or III. Phase IV will convert existing single lane highways into two lanes with paved shoulders. The plan will soon be presented to the government for approval.

* Phase V: As road traffic increases over time, a number of four lane highways will need to be upgraded/expanded to six lanes. The current plan calls for upgrade of about 5,000 km of four-lane roads, although the government has not yet identified the stretches.

* Phase VI: The government is working on constructing expressways that would connect major commercial and industrial townships. It has already identified 400 km of Vadodara (earlier Baroda)-Mumbai section that would connect to the existing Vadodara (earlier Baroda)-Ahmedabad section. The World Bank is studying this project. The project will be funded on BOT basis. The 334km Expressway between Chennai—Bangalore (Now called Bengaluru) and 277 km Expressway between Kolkata—Dhanbad has been identified and feasibility study and DPR contract has been awarded by NHAI.

* Phase VII: This phase calls for improvements to city road networks by adding ring roads to enable easier connectivity with national highways to important cities. In addition, improvements will be made to stretches of national highways that require additional flyovers and bypasses given population and housing growth along the highways and increasing traffic. The government has not yet identified a firm investment plan for this phase. The 19-km long Chennai Port—Maduravoyal Elevated Expressway is being executed under this phase.

APPENDIX 5 ANNEXURE II: CASH FLOW STATEMENT FOR TOLL REVENUE, MAINTENANCE EXPENSES AND SERVICING OF LOAN COMPONENT OF EXTERNAL ASSISTANCE

Cash Flow Statement for Toll Revenue, Maintenance Expenses and Servicing of Loan Component of External Assistance

		Phase-I										
					Servicing & Repayment of Loan against EA			Servicing & Repayment of ADB Loan for Surat-Manor				
Year	Opening Balance	Length in km	Toll Revenue	Maint-enance Exp.	Interest	Principal	Sub-Total	Interest	Principal	Sub-Total	Total Outflows	Net Surplus
1	2	3	4	5	6A	6B	6C	7A	7B	7C	8	9
2005 - 2006	-345	3827	773	383	186	140	326	34	6	40	748	-320
2006 - 2007		5173	1894	517	167	140	307	34	13	46	871	1,023
2007 - 2008		5164	2677	516	148	140	288	33	14	47	851	1,826
2008 - 2009		3794	2031	379	129	140	269	32	16	48	696	1,335
2009 - 2010		1794	999	179	110	140	250	32	17	49	478	521
2010 - 2011		0	0	0	91	140	231	31	19	50	281	-281
2011 - 2012		0	0	0	72	140	212	30	21	51	263	-263
2012 - 2013		0	0	0	53	140	193	29	23	52	245	-245
2013 - 2014		0	0	0	34	110	144	28	25	53	197	-197
2014 - 2015		0	0	0	19	81	100	27	28	55	155	-155
2015 - 2016		0	0	0	8	6	14	25	31	56	70	-70
2016 - 2017		0	0	0	7	6	13	24	34	58	71	-71
2017 - 2018		0	0	0	6	6	12	22	38	60	72	-72
2018 - 2019		0	0	0	6	6	11	20	41	62	73	-73
2019 - 2020		0	0	0	5	6	10	19	46	64	75	-75
2020 - 2021		0	0	0	4	6	10	16	50	67	76	-76
2021 - 2022		0	0	0	3	6	9	14	56	70	78	-78
2022 - 2023		0	0	0	2	6	8	11	61	73	81	-81
2023 - 2024		0	0	0	2	6	7	9	67	76	83	-83
2024 - 2025		0	0	0	1	6	6	5	74	80	86	-86
2025 - 2026		0	0	0	0	0	0	2	40	42	42	-42
2026 - 2027		0	0	0	0	0	0	0	0	0	0	-
2027 - 2028		0	0	0	0	0	0	0	0	0	0	-
2028 - 2029		0	0	0	0	0	0	0	0	0	0	-
2029 - 2030		0	0	0	0	0	0	0	0	0	0	-
2030 - 2031		0	0	0	0	0	0	0	0	0	0	-
Total	-345		8374	1975	1049	1370	2419	477	721	1198	5592	2437

Assumptions:

i) Opening balance has been worked out based on the net of the total amount of toll collection, total amount of maintenance exp. & total amount of int. & repayment of loan component up to 2004-05.

ii) Length has been taken based on the quarter-wise completion schedule

iii) Toll has been considered on the completed length excluding the length under BOT(T)

iv) Toll has been considered @ Rs.0.50 crores per km in Phase-I, @ Rs.0.18 crores per km in Phase-II with 5% p.a. growth on a/c of traffic.

v) Maintenance has been considered @Rs.0.10 crores per km. on annualised basis (including the routine maintenance @ Rs.0.04 crore per km pa + cost of HTMS & other equipments @Rs.0.02 crores per km + periodic maintenance on annualised basis @ Rs.0.04 crore.

(Rs. in crore)

Phase-II									Net Surplus carried over to main Cash Flow Statement 16
	Length in km 10	Toll Revenue 11	Maint-enance Exp. 12	Servicing & Repayment of External Assistance			Total Outflows 14	Net Surplus 15	
				Interest 13A	Principal 13B	Sub-Total 13C			
	0	-	-	4	3	7	7	-7	-327
	50	4	5	33	25	58	63	-59	964
	1696	40	170	129	99	228	398	-358	1,468
	4176	307	418	149	123	272	690	-383	952
	5499	767	418	172	152	324	741	26	546
		1,028	418	151	152	303	721	307	26
		1,080	418	131	152	283	700	379	116
		1,134	418	110	152	262	680	454	209
		1,190	418	90	152	242	659	531	334
		1,250	418	69	152	221	639	611	456
		1,312	418	48	149	198	615	697	627
		1,378	418	28	127	155	573	805	734
		1,447	418	11	53	65	482	965	893
		1,519	418	4	29	33	450	1,069	995
		1,595	418	0	0	0	418	1,177	1,103
		1,675	418	0	0	0	418	1,257	1,181
		1,759	418	0	0	0	418	1,341	1,263
		1,846	418	0	0	0	418	1,429	1,348
		1,939	418	0	0	0	418	1,521	1,438
		2,036	418	0	0	0	418	1,618	1,532
		2,137	418	0	0	0	418	1,720	1,678
		2,244	438	0	0	0	438	1,806	1,806
		2,357	460	0	0	0	460	1,896	1,896
		2,474	483	0	0	0	483	1,991	1,991
		2,598	508	0	0	0	508	2,091	2,091
		2,728	533	0	0	0	533	2,195	2,195
	11421	37844	10114	1130	1522	2652	12766	25078	27515

vi) Interest on loan component of EA under phase-I has been calculated on the reducing balance as per simple int. rate given in the approval letter of the funds received so far. For the estimated loan funds to be received against phase-I & phase-II interest rate has been considered @ 13.5% p.a. on simple interest basis on reducing balance.

vii) Repayment of loan component of EA under phase-I has been considered in the specified number of installments given in the approval letter of the funds received so far. For the estimated loan funds to be received against phase-I & phase-II the repayment has been considered in 10 equal annual instalments based on the latest approval letter.

viii) The Loan amount of ADB is taken as US$ 165 million against the orignal amount of US$ 180 million. Repayment of loan has been considered in 6 monthly installments starting from 01.01.2006 to 01.07.2025 as per the repayment schedule. Intertest has been calculated @4.7%

APPENDIX 6 NHAI CONTRACTS WITH BOT AND ANNUITY

NHAI Contracts with BOT Funding
(Source: http://www.pppinindia.com)

Toll Based Projects
NHDP Phase I

Contract Name	State	Total cost	Project Award cost	Remarks
Vivekananda Bridge and Approach	West Bengal	641	120	4 LANED
Mahapura (near Jaipur) -Kishangarh (6 Lane) km 273.5 - km 363.885	Rajasthan	644	211	4 LANED
ROB at Kishangarh	Rajasthan	18	16.66	4 LANED
Nellore - Tada (AP-7) km 163.6 - km 52.8	Andhra Pradesh	621.35	127.3	4 LANED
Satara - Kagal km 725 - km 592.24 (2 Lane)	Maharashtra	600	240	4 LANED
Tumkur - Neelmangala km 62 - km 29.5	Karnataka	155	24.83	4 LANED
Durg Bypass (2 Laned new facility) 2 Lane Bypass	Chattisgarh	70	0	2 LANED
Delhi - Gurgaon Section (Access Controlled 8/6 Lane) km 14.3 - km 42	Delhi[9.7]/ Haryana[18]	710	-61	Under Implementation
Nandigama - Vijayawada	Andhra Pradesh	138.65	40.2	4 LANED
Sub Total		3598.00	718.99	

NHDP Phase II

Contract Name	State	Total cost	Project Award cost	Remarks
Rajkot Bypass & Gondal Jetpur Package-VII) km 117.00 to km 143.00 & km 175.00 to km	Gujarat	388.09	-59.17	Under Implementation
Panipat Elevated Highway Km 96.00 to 86.00	Haryana	270	-96.4	Under Implementation
Farukhanagar to Kottakata (NS-Km. 34.140 to km 80.050	Andhra Pradesh	255	-70.37	Under Implementation

Farukhanagar to Kotakatta (NS-Km 80.050 to km 135.469	Andhra Pradesh	302	45	Under Implementation
Krishnagiri to Thopurghat (NS-Km. 94.000 to 156	Tamil Nadu	372.7	-140.04	Under Implementation
Salem to Karur (NS-2/TN-2) Km. 207.050 to Km 248.625	Tamil Nadu	253.5	-46.004	Under Implementation
Salem to Karur (NS-2/TN-3) Km 258.645 to Km 292.6	Tamil Nadu	205.6	24	Under Implementation
Karur to Madurai (TN-4) Km 305.6 to Km 373.275	Tamil Nadu	327.2	86	Under Implementation
Karur to Madurai (TN-5) Km 373.275 to km 426.6	Tamil Nadu	283.5	31	Under Implementation
Salem to Kerala Border Section Km 203.96 on NH-7 to km 53.00 on NH-47	Tamil Nadu	469.8	129	Under Implementation
Salem to Kerala Border Section Km 53.000 to Km 100	Tamil Nadu	379.8	17.5	Under Implementation
Thrissur to Angamali (KL-I) Km. 270.000 to Km. 316.70	Kerala	312.5	-84.4	Under Implementation
Tindivanam - Ulundurpet (Pkg -VI- km 121 - km 192.25	Tamil Nadu	480	-152.1	Under Implementation
Ulundurpet - Padalur (Pkg- VI-B) km 192.25 - km 285.00	Tamil Nadu	460	40	Under Implementation
Padalur - Trichy (Pkg - VI-C) km 285.00 - km 325.00	Tamil Nadu	320	60	Under Implementation
Sub Total		5079.69	-215.98	

NHDP Phase III

Contract Name	State	Total cost	Project Award cost	Remarks
Trichy - Karur	Tamil Nadu	516	148.5	Under Implementation
Pondicherry - Tindivanam	Tamil Nadu	285	45	Under Implementation
Chattisgarh /	Maharash	424	10	Under

Maharashtra Border - Wainganga Bridge	tra			Implementation
Thanjarur - Trichy km 80 - km 135.750	Tamil Nadu	280	78.44	Under Implementation
Neelamangala Junction on NH 4 with NH 48 to Devihalli	Karnataka	441	175.92	Under Implementation
Salem-Ulundrupet (BOT-1/TN-06) km. 0.313 to km. 136.670	Tamil Nadu	941	366.05	Under Implementation
Madurai- Arupukottai-Tuticorin km 138.8 to km 264.5	Tamil Nadu	629	144	Under Implementation
Trichy - Dindigul	Tamil Nadu	576	226.3	Under Implementation
End of Durg Bypass - Chattisgarh / Maharashtra Border	Chattisgarh	464	-0.29	Under Implementation
Delhi/ Haryana Border to Rohtak	Haryana	486	0	Under Implementation
Banglore - Neelamangala	Karnataka	445	-20	Under Implementation
Banglore- Hoskote-Mudbagal Section km 237.700 to km 318.000	Karnataka	565	189.29	Under Implementation
Zirakpur - Parwanoo	Haryana/ Himanchal	295	117	Under Implementation
Kurali - Kiratpur	Punjab	309	43.92	Under Implementation
Elevated Highway from Silk board junction to electronic city	Karnataka	450	-16	Under Implementation
Guna Bypass Km. 319/700 to Km. 332/100	Madhya Pradesh	46	-19.03	Under Implementation
Meerut-Muzaffarnagar Km 52.250 to Km.131.00	Uttar Pradesh	359	84.72	Under Implementation
Dhule - Pimpalgaon Km. 380/0 to Km. 265/0	Maharashtra	556	-58.85	Under Implementation
Mahua-Jaipur Km. 120 to Km 228	Rajasthan	483	99	Under Implementation
Bharatpur-Mahua km. 63 to Km. 120	Rajasthan	250	96	Under Implementation
Gonde-Vadape (Thane)	Maharash	579	80.04	Under

Km. 440/000 to Km. 539/500	tra			Implementation
Aurang - Raipur Km 232 to Km. 281	Chattisgarh	190	7.6	Under Implementation
Jalandhar - Amritsar Km. 407/100 to Km. 456/100	Punjab	263	-6.88	Under Implementation
Ambala - Zirakpur Km. 5/735 to Km. 39/961 of NH-22 and Km.	Haryana[6]/ Punjab[30	298	-105.86	Under Implementation
Kondhali - Telegaon Km 50 to Km 100	Maharashtra	212	9.89	Under Implementation
Indore-Khalghat	Madhya Pradesh	472	-5.8	Under Implementation
Agra - Bharatpur km 17.756 - km 63	Uttar Pradesh [24.75] /Rajasthan [20.25]	195	-2.87	Under Implementation
Sitapur - Lucknow Km 488.27 to km 413.20	Uttar Pradesh	322	117.08	Under Implementation
Nagpur - kondhali Km 9.2 to Km 50	Maharashtra	168	57.11	Under Implementation
Sub Total		**11499.00**	**1860.28**	

NHDP Phase V

Contract Name	State	Total cost	Project Award cost	Remarks
Vadodara to Bharuch Package BOT-1 (Six lane) 6 lanning (Km 108.7 to km 192)	Gujarat	660	-471	Under Implementation
Bharuch to Surat Package BOT- II (Six lane) 6 lanning	Gujarat	492	-504	Under Implementation
Sub Total		**1152.00**	**-975.00**	
Total		**21328.69**	**1388.29**	

NHAI Contracts with Annuity
NHDP Phase I
Annuity Based Projects

Contract Name	State	Total cost	Project Award cost	Remarks
Panagarh - Palsit km 517 - km 581	West Bengal	350	55.5	4 LANED
Palsit - Dankuni km 581 - km 646 Durgapur Expressway	West Bengal	432.4	39.998	4 LANED
Ankapalli - Tuni km 359.2 - km 300 34.981 (2 Lane)	Andhra Pradesh	283.2	29.481	4 LANED
Tuni - Dharmavaram (AP-16) km 300 - km 253	Andhra Pradesh	231.9	27.912	4 LANED
Dharmavaram - Rajahmundry (AP- km 253 -km 200	Andhra Pradesh	206	29.619	4 LANED
Nellore Bypass km 178 .2- km 161	Andhra Pradesh	143.2	12.96	4 LANED
Maharastra Border-Belgaum km 592 - km 515 (2 Lane)	Karnataka	332	50.51	4 LANED
Tambaram - Tindivanam km 28 - km 121	Tamil Nadu	375	41.856	4 LANED
Total		**2354**	**288**	

NHDP Phase II
Annuity Based Projects

Kosi Bridge including approaches and Guide Bond & Afflux Bond km 155 to km 165	Bihar	418.04	31.9	Under Implementation
Gorakhpur Bypass Km. 251.7 to Km. 279.8	Uttar Pradesh	600.24	48.6	Under Implementation
Bara to Orai km 449 to 422 on NH-2 & km 255 to km 220	Uttar Pradesh	465	44.82	Under Implementation
Palanpur to Swaroopganj (Rajasthan -42 km & Gujarat-34 km 264 to km 340	Gujarat[34] /Rajasthan[42]	498	43.21	Under Implementation
Gwalior Bypass (NS-1/BOT/MP-1) Km 0 to Km 42.033	Madhya Pradesh	300.93	26.53	Under Implementation
Gwalior - Jhansi Km 16 to Km 96.127	Madhya Pradesh[68.5] /Uttar Pradesh[11.5]	604	52.29	Under Implementation

Jhansi to Lalitpur (NS-1/BOT/UP-Km 49.7 to Km 99	Uttar Pradesh	276.09	23.95	Under Implementation
Jhansi to Lalitpur (NS-1/BOT/UP-Km 0 to Km 49.79	Uttar Pradesh	355.06	29.95	Under Implementation
Lakhnadon to MP/MH Border (NS-1/BOT/MP-2) km 547.4 to km 596.75	Madhya Pradesh	263.17	22.42	Under Implementation
Lakhnadon to MP/MH Border (NS-1/BOT/MP-3) km 596.75 to km 653.225	Madhya Pradesh	407.6	35.4	Under Implementation
Islam Nagar to Kadtal (NS- Km 230 to Km 278	Andhra Pradesh	546.83	44.37	Under Implementation
MH/AP border to Islam Nagar (NS-2/BOT/AP-6) Km 175 to Km 230	Andhra Pradesh	360.42	31.48	Under Implementation
Kadloor Yellareddy to Gundla Pochampalli (NS-2/BOT/AP-2) Km 367 to Km 447	Andhra Pradesh	490	54.18	Under Implementation
Kadal to Armur (NS-2/BOT/AP-8) Km 278 to Km 308	Andhra Pradesh	271.73	23.8	Under Implementation
Hyderabad Bangalore section (NS-2/BOT/AP-5) Km 135.469 to Km 211	Andhra Pradesh	592	56.52	Under Implementation
AP/Karnatka border- Nandi Hill crossing & Devenhalli to Meenu Km 463.6 to Km 527 & km 535-km 539	Karnataka	402.8	32.94	Under Implementation
Total		**6852**	**602**	
Total		**9206**	**890**	

APPENDIX 7 LIST OF PUBLIC-PRIVATE CONTRACTS - INDIAN HIGHWAYS AND ROADS (NEXT PAGE ONWARDS)

(http://ppi.worldbank.org/explore/Report.aspx accessed December 23rd 2009)

Financial Closure Year	Project Name	Related Names	Type Of PPI	Subtype Of PPI	Project Status	Segment	Location	Contract Period	Termination Year	Govt Granting Contract	Type Of Govt Support	Investment Year	Percent Private	Govt Payment Commitments	Physical Assets	Total Investment	Gov Cash Assist	Capacity	Capacity Year	Bid Criteria	Award Method	Number Of Bids	Sponsors
1990	Rao-Pithanpur Toll Road	Rao Pithampur Link Road	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Indore City, Madhya Pradesh			..		1990	100	0	1.9	1.9		11.5	1990				Infrastructure Leasing & Financial Services (.. / India), Madhya Pradesh Audyogik Kendra Vikas Nigam (Indore) Ltd (.. / ..)
1996	Karaunti Bridge		Greenfield project	Build, operate, and transfer	Concluded	Bridge	Sirohi	5	2001	..		1996	100	0	0.8	0.8		0.09	1996				TCI Infrastructure Finance Ltd. (.. / United Kingdom)
1996	Thane Bhiwandi Bypass Road	Thane Bhiwandi Bypass	Concession	Rehabilitate, operate, and transfer	Operational	Highway	Bombay, Maharastra	18	2023	..		1996	100	0	4.7	4.7		23.6	1996				Ideal Road Builders Ltd (.. / India)
1996	Udaipur Bypass		Concession	Rehabilitate, operate, and transfer	Concluded	Highway	Rajasthan State	11	2008	..		1996	100	0	6.7	6.7		11	1996				Atlanta Limited (100% / India)
1997	Chalthan ROB		Greenfield project	Build, operate, and transfer	Concluded	Bridge	Intersection of NH-8 and Surat - Bhusaval BG line, Gujarat State	3	2000	..		1997	100	0	2.8	2.8			1997				Ashvika Construction (.. / ..)
1997	Pali Bypass		Greenfield project	Build, operate, and transfer	Operational	Highway	Pali (Rajasthan state)	20	2017	..	Revenue Guarantee	1997	100	0	2.1	2.1		103	1997				Larsen & Toubro Limited (.. / India)
1997	Patalganga Bridge		Concession	Rehabilitate, operate, and transfer	Operational	Bridge	Maharastra State	15	2012	..		1997	100	0	8.4	8.4		1	1997				Ideal Road Builders Ltd (.. / India)
1997	Six Bridges in Andhra Pradesh		Concession	Rehabilitate, operate, and transfer	Operational	Bridge	Andhra Pradesh State	14	2011	..		1997	100	0	13	13			1997				P.S. Raj Industries (.. / ..)
1998	Amaravathi River Bridge	Karur Bridge	Greenfield project	Build, operate, and transfer	Operational	Bridge	Karur	14	2012	Local	Revenue Guarantee	1998	100	0	3.8	3.8		0.3	1998				East Coast Construction and Industries Pvt. Ltd. (100% / India)
1998	Coimbatore Bypass		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Tamil Nadu State	30	2028	..		1998	100	0	24	24		33	1998				Larsen & Toubro Limited (100% / India)
1998	Dahej Bridge	ROB near GNFC Bharuch	Greenfield project	Build, operate, and transfer	Concluded	Bridge	Bharuch, Gujarat State	5	2003	..		1998	100	0	1.4	1.4			1998				Vijay M. Mistry Construction Ltd. (78% / India), Rajkamal Builders (23% / India)
1998	Delhi-Noida Bridge Project	Noida Toll Bridge Company	Greenfield project	Build, operate, and transfer	Operational	Bridge and highway	Delhi, Noida	30	2027	..		1998	70	0	94	94		10.8	1998				Infrastructure Leasing & Financial Services (54% / India)
1998	Durg Bypass		Concession	Rehabilitate, operate, and transfer	Operational	Highway	Madhya Pradesh State	30	2028	..	Revenue Guarantee	1998	100	0	20	20		18.4	1998				Shakti kumar M.Sancheti Ltd (100% / India)
1998	Hubli-Dharwar Bypass		Concession	Rehabilitate, operate, and transfer	Operational	Highway	Kamataka State	24	2021	State/Provincial	Revenue Guarantee	1998	100	0	17	17		30	1998				Bharat Forge Ltd (100% / India)
1998	Nardhana ROB		Concession	Rehabilitate, operate, and transfer	Operational	Highway	Maharashtra State	13	2010	..		1998	100	0	8.6	8.6		13	1998				Ajush Ajay Construction Pvt. Ltd (.. / India)
1999	Ahmedabad - Mehsana Road		Greenfield project	Build, operate, and transfer	Operational	Highway	Ahmedabad - Mhesana (Gujarat)	30	2029	..		1999		0	77.2	77.2		53	1999				Larsen & Toubro Limited (.. / India)
1999	Khambatki Ghat Tunnel & Road		Greenfield project	Build, operate, and transfer	Operational	Highway and tunnel	NH-4, Maharashtra State	10	2009	..		1999	100	0	8.9	8.9		8	1999				Ideal Road Builders Ltd (100% / India)
1999	Kishangarh Bypass ROB		Greenfield project	Build, operate, and transfer	Concluded	Bridge	Kishangarh, Rajasthan State	4	2003	..		1999	100	0	3.8	3.8			1999				MSK Projects (India) Ltd (.. / India)
1999	Korttailaiyar River Bridges	Karanodai Bridge	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge	Chennai (Tamil Nadu)	10	2009	..		1999	100	0	5.7	5.7		0.69	1999				Zoom Developers (100% / India)
1999	Mahi River Bridge		Greenfield project	Build, operate, and transfer	Concluded	Bridge	Vadodara, Gujarat State	5	2006	..		1999	100	0	9.9	9.9		2	1999				Rajkamal Builders (50% / India), Vijay M. Mistry Construction Ltd. (50% / India)
1999	Narmada Infrastructure Construction Enterprise Limited	Second Narmada Bridge	Greenfield project	Build, operate, and transfer	Operational	Bridge	State of Gujarat	15	2012	Federal		1999	80	0	31.1	31.1		6	1999				Larsen & Toubro Limited (80% / India)
1999	Nasirabad ROB		Greenfield project	Build, operate, and transfer	Operational	Bridge	Maharashtra State	12	2010	..		1999	100	0	2.5	2.5		0.03	1999				Ashoka Vastushilp Pvt. Ltd. (100% / India)
1999	Vadodara - Halol Toll Road		Greenfield project	Build, operate, and transfer	Operational	Highway	Vadodara - Halol (Gujarat)	30	2029	..		1999	67	0	35.5	35.5		32	1999				Infrastructure Leasing & Financial Services (34% / India)
1999	Wainganga Bridge		Greenfield project	Build, operate, and transfer	Operational	Bridge	Waiganga River, Maharashtra	19	2018	..		1999	100	0	7.7	7.7		0.53	1999				Jaiswal-Ashoka Infrastructure Pvt. Ltd. (.. / India)
1999	Watrak River Bridge Project		Greenfield project	Build, operate, and transfer	Operational	Bridge	Wartak River (Gujarat)	11	2009	..		1999	100	0	7	7		9	1999				Larsen & Toubro Limited (100% / India)
2000	Mumbra Bypass Project		Greenfield project	Build, operate, and transfer	Operational	Highway	Maharashtra State	16	2016	State/Provincial		2000	100	0	29.6	29.6		5	2000				Atlanta Limited (100% / India)
2001	North Karantaka Expressway Limited	Belgaum Maharashtra Highway	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Karnataka State	18	2020	Federal	Fixed government payments	2001	42	0	123	123	318	77	2001	Other	Competitive bidding		Punj Lloyd Limited (42% / India)
2002	Chayapuri ROB	ROB Chhayapuri Vadodra	Greenfield project	Build, operate, and transfer	Operational	Bridge	Vadodara City	15		..		2002	100	0	5.5	5.5			2002				Ranjit Construction Private Limited (100% / India)
2002	GMR Ankapalli-Tuni Expressways Private Limited		Greenfield project	Build, operate, and transfer	Operational	Highway	Tuni to Ankapalli, Andhra Pradesh			..		2002	100	0	152.2	152.2		60	2002				United Engineers (Malaysia) Berhad (26% / Malaysia), GMR Group (74% / India)
2002	GMR Tambaram-Tindivanam Expressways Private Limited		Greenfield project	Build, operate, and transfer	Operational	Highway	Tambaram to Tindivanam, Tamil Nadu			..		2002	100	0	0	0		90	2002				United Engineers (Malaysia) Berhad (26% / Malaysia), GMR Group (74% / India)
2002	Neelmangla Tumkur Road Project	Jas Toll Road Company Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Karnataka State	20	2023	Federal	Fixed government payments	2002	100	0	49.2	49.2	5.1	33	2002	Lowest subsidy required	Competitive bidding		Abhijeet Group (100% / India)
2002	Nellore Bypass	NYSE Infrastructure Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Nellore, Andhra Pradesh State	17	2016	Federal	Fixed government payments	2002	100	0	34	34	84.3	17	2002		Competitive bidding		Navayuga Group (51% / India), Soma Enterprise Ltd (49% / India)

2002	Tada Nellore & Vijaywada Nadigama Highway		Greenfield project	Build, operate, and transfer	Operational	Highway	Andra Pradesh	30	2033	..		2002	100	0	181.6	181.6		158	2002				Others (100% / ..)
2003	Delhi-Gurgaon Expressway	Delhi-Gurgaon Super Connectivity Limited	Greenfield project	Build, operate, and transfer	Operational	Highway	Delhi, Gurgaon	17	2023	..		2003	100	0	126	126		28	2003				DS Constructions Ltd (99% / India)
2003	Dewas-Ujjain-Badnagar-Badnawar Road	RV Infrastructure Engineers Pvt. Ltd.	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State of Madhya Pradesh	15	2018	State/Provincial	Fixed government payments	2003	100	0	10.6	10.6	5.2	98.3	2003	Lowest subsidy required	Competitive bidding		RV Infrastructure Engineers Pvt. Ltd. (100% / India)
2003	Hoshangabad-Khandwa Road		Greenfield project	Build, operate, and transfer	Operational	Bridge and highway	Hoshangabad-Harda-Khandwa	15	2018	State/Provincial	Fixed government payments	2003	100	0	18.5	18.5	11.5	185	2003	Lowest subsidy required	Competitive bidding		MSK Projects (India) Ltd (50% / India)
2003	Hoshangabad-Piparia-Panchmarhi Road	Chetak Enterprises Pvt. Ltd.	Greenfield project	Build, operate, and transfer	Operational	Highway	State of Madhya Pradesh	15	2018	State/Provincial	Fixed government payments	2003	100	0	12.86	12.86	7.62	126.7	2003	Lowest subsidy required	Competitive bidding		Chetak Enterprises Pvt Ltd (100% / India)
2003	Indore-Edelabad Road		Greenfield project	Build, operate, and transfer	Operational	Bridge and highway	Indore-Sanawad-Burhanpur-Edlabad	15	2018	State/Provincial	Fixed government payments	2003	100	0	28	28	10	203	2003	Lowest subsidy required	Competitive bidding		VIVA Highways Private Ltd. (100% / India)
2003	Jabalpur-Narsinghpur-Piparia Road	JNP Road Infrastructure Project	Greenfield project	Build, operate, and transfer	Construction	Highway	State of Madhya Pradesh	15	2018	State/Provincial	Fixed government payments	2003	100	0	17.32	17.32	9.8	140	2003	Lowest subsidy required	Competitive bidding		Kotecha Group (100% / India)
2003	Jaipur-Kishangarh Highway Project		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Rajasthan	20	2023	Federal	Fixed government payments	2003	100	0	151.56	151.56	45.3	90.4	2003	Lowest subsidy required	Competitive bidding		GVK Group (100% / India)
2003	Raipur Durg Highway Project	DSC Vicon Ventures Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Chhattisgarh State	12	2015	Federal		2003	100	0	24.5	24.5		27	2003				DS Constructions Ltd (100% / India)
2003	Raisen-Rahatgarh Road	MSK Highways Limited, Raisen-Rahatgadh Highway	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State of Madhya Pradesh	15	2018	State/Provincial	Fixed government payments	2003	100	0	12.4	12.4	7.04	101	2003	Lowest subsidy required	Competitive bidding		MSK Projects (India) Ltd (100% / India)
2003	Rewa-Amarkantak Road		Greenfield project	Build, operate, and transfer	Construction	Bridge and highway	Rewa-Jaisinghnagar-Shahdol-Amarkantak	15	2018	..	Fixed government payments	2003	100	0	25	25	12.5	247	2003	Lowest subsidy required	Competitive bidding		IJM Corporation Berhad (100% / Malaysia)
2003	Sagar-Damoh-Jabalpur Road	Jabalpur Corridor (I) Pvt. Ltd	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State of Madhya Pradesh	15	2018	State/Provincial	Fixed government payments	2003	100	0	19.26	19.26	10.24	176	2003	Lowest subsidy required	Competitive bidding		Jabalpur Corridor (I) Pvt. Ltd (100% / India)
2003	Satna-Umaria Road		Greenfield project	Build, operate, and transfer	Construction	Bridge and highway	Satna-Maihar-Tala-Umaria	15	2018	..	Fixed government payments	2003	100	0	12.5	12.5	6.5	141	2003	Lowest subsidy required	Competitive bidding		IJM Corporation Berhad (100% / Malaysia)
2003	Seoni-Balaghat-Gondia Road	AAP Infrastructure Ltd.	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State of Madhya Pradesh	15	2018	State/Provincial	Fixed government payments	2003	100	0	12.84	12.84	7.5	114	2003	Lowest subsidy required	Competitive bidding		AAP Infrastructure Ltd. (100% / India)
2003	Ujjain-Jhalawad Road		Greenfield project	Build, operate, and transfer	Operational	Bridge and highway	Ujjain-Agar-Susner-Jhalawad	15	2018	..	Fixed government payments	2003	100	0	15	15	5	134	2003	Lowest subsidy required	Competitive bidding		Agroh Infrastructure Developers Private Ltd (100% / India)
2004	Bangalore Mysore Infrastructure Corridor	Mysore Infrastructure Corridor, Nandi Infrastructure Corridor Enterprises LTD. (NICE), Bangalore-Mysore expressway	Greenfield project	Build, operate, and transfer	Construction	Highway	Karnataka State	30	2034	State/Provincial		2004	100	0	185.3	185.3		62	2004				Kalyani Group (.. / India), SAB International Ltd. (.. / United States), Vanasse Hangen Brustlin Inc. (.. / United States)
2004	Brindavan Infrastructure Co. Pvt. Ltd.	Bangalore – Mysore State Highway, State Highway 17, SH-17	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Between the city of Bangalore and Maddur, State of Karnataka	8	2012	State/Provincial	Fixed government payments	2004	100	0	61.8	61.8	105.6	62	2004	Other	Competitive bidding		KMC Constructions Ltd (.. / India), Nagarjuna Construction Company (.. / India), Maytas Infrastructure Pvt Ltd (.. / India)
2004	Mumbai-Pune Expressway and Mumbai-Pune section of National Highway 4		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Maharashtra	15	2019	State/Provincial		2004		202.56	252.29	454.85		205	2004	Highest price paid to government	Competitive bidding		Ideal Road Builders Ltd (100% / India)
2004	Second Vivekananda Bridge Tollway Company Limited	Second Vivekananda Bridge	Greenfield project	Build, operate, and transfer	Construction	Bridge and highway	City of Kolkata, State of West Bengal	30	2034	Federal	Fixed government payments	2004	100	0	144	144	27	6	2004		Competitive bidding		IJM Corporation Berhad (33% / Malaysia), Larsen & Toubro Limited (33% / India)
2004	Thiruvananthapuram Road Development Company Limited		Concession	Build, rehabilitate, operate, and transfer	Construction	Highway	City of Thiruvananthapuram, Kerala State	18	2022	State/Provincial	Fixed government payments	2004	50	0	50.5	50.5	120	42	2004	Other	Competitive bidding	3	Punj Lloyd Limited (50% / India)
2005	Himatnagar Bypass SH-9		Concession	Rehabilitate, operate, and transfer	Operational	Highway	State - Gujarat	15	2020	State/Provincial		2005	100	0	1.75	1.75	0	9	2005		Competitive bidding		MSK Projects (India) Ltd (100% / India)

2005	Nasirabad Kekri Deoli Road SH - 26		Concession	Rehabilitate, operate, and transfer	Operational	Highway	State - Rajasthan	7	2012	State/Provincial		2005	100	0	4.86	4.86	0	32	2005	Other	Competitive bidding		Murari Lal Agarwal Construction Pvt Ltd (100% / India)
2005	Panipat Elevated Express Highway	Panipat Highway, L&T Panipat Elevated Corridor P Ltd	Concession	Build, rehabilitate, operate, and transfer	Construction	Highway	Panipat district, State of Haryana	20	2025	Federal		2005	100	21.86	95.58	117.44		10	2005	Lowest subsidy required	Competitive bidding		Larsen & Toubro Limited (100% / India)
2005	Sahol - Kim - Mandvi SH-65	Kim Mandvi Road	Concession	Rehabilitate, operate, and transfer	Operational	Highway	State - Gujarat	20	2025	State/Provincial		2005	100	0	5.25	5.25		38	2005		Competitive bidding		MSK Projects (India) Ltd (100% / India)
2005	Thane Ghodabunder Road SH - 42		Concession	Rehabilitate, operate, and transfer	Operational	Highway	State - Maharashtra	15	2020	State/Provincial		2005	100	0	5.25	5.25	0	15	2005		Competitive bidding		Ideal Road Builders Ltd (100% / India)
2006	Agra Bharatpur Road Project	Oriental Pathways (Agra) Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Rajasthan State, Uttar Pradesh State	20	2026	Federal		2006	100	0.66	45	45.66		45	2006	Lowest subsidy required	Competitive bidding		Oriental Structural Engineers Private Ltd. (50% / India)
2006	Balachaur-Dasuya Road Project	Rohan Rajdeep Tollways Limited	Concession	Rehabilitate, operate, and transfer	Operational	Highway	State of Punjab	17	2023	State/Provincial		2006	100	0	27.3	27.3		105	2006				Rohan Builders Private Limited (100% / India)
2006	Bangalore Elevated Tollway Limited	BETL, Silk Board Junction to Electronics City Elevated Expressway Project	Concession	Build, rehabilitate, operate, and transfer	Construction	Highway	Karnataka State	20	2026	Federal		2006	100	3.5	165.3	168.8		10	2006	Lowest subsidy required	Competitive bidding	5	Maytas Infrastructure Pvt Ltd (34% / India), Nagarjuna Construction Company (34% / India), Soma Enterprise Ltd (34% / India)
2006	Bharatpur Mahua Road Project	Madhucon Agra-Jaipur Expressways Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Rajasthan State	25	2030	Federal	Fixed government payments	2006	100	0	66	66	13.7	57	2006	Lowest subsidy required	Competitive bidding		Madhucon Projects Ltd (.. / India), SREI Infrastructure Finance Ltd (.. / India)
2006	Bhiwandi - Kalyan - Shil Phata SH - 40		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Maharashtra	15	2021	Federal		2006	100	0	57	57	0	22	2006		Competitive bidding	3	PLUS Expressways Berhad (PEB) (100% / Malaysia)
2006	Bhuj Nakhtrana SH - 42		Concession	Rehabilitate, operate, and transfer	Operational	Highway	State - Gujarat	13	2019	State/Provincial		2006	100	0	9	9	0	45	2006		Competitive bidding		MSK Projects (India) Ltd (100% / India)
2006	Chattisgarh / Maharashtra Border - Wainganga Bridge NH - 6		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Maharashtra	20	2026	Federal	Fixed government payments	2006	100	0	106	106	2.5	80	2006	Lowest subsidy required	Competitive bidding	2	Infrastructure Development Finance Company Ltd (IDFC) (.. / India)
2006	DS Toll Road Limited	Dindigul Samyanallur Road Project, Salem Karur Road Project	Concession	Rehabilitate, operate, and transfer	Operational	Bridge and highway	Tamil Nadu State	20	2026	Federal	Fixed government payments	2006	100	0	62.6	62.6	6.8	53	2006	Lowest subsidy required	Competitive bidding		Reliance ADA Group (100% / India)
2006	GMR Ambala Chandigarh Expressway Pvt. Ltd.	Ambala - Zirakpur Road Project, Ambala Chandigarh Road Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Punjab State, Haryana State	20	2026	Federal		2006	100	23.37	63.15	86.52		35.1	2006	Lowest subsidy required	Competitive bidding		GMR Group (100% / India)
2006	GMR Jadcherla Expressways Private Limited	Farukhnagar Jadcherla Highway Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Andhra Pradesh State	20	2026	Federal		2006	100	18.25	85.76	104.01		58	2006	Lowest subsidy required	Competitive bidding		GMR Group (100% / India)
2006	GMR Pochanpalli Expressways Private Limited	Adloor Gundla Pochanpalli Road Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Andhra Pradesh State	20	2026	Federal	Fixed government payments	2006	100	0	152	152		103	2006	Lowest subsidy required	Competitive bidding		GMR Group (100% / India)
2006	GMR Ulundurpet Expressways Private Limited	Tindivanam Ulundurpet Road Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Tamil Nadu State	20	2026	Federal		2006	100	33.6	175.5	209.1		71	2006	Lowest subsidy required	Competitive bidding		GMR Group (100% / India)
2006	Guna Bypass	Guna Infrastructure Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Madhya Pradesh			Federal		2006	100	4.2	10.2	14.4		14	2006	Lowest subsidy required	Competitive bidding		IVRCL Infrastructures & Projects Ltd. (100% / India)
2006	IDAA Infrastructure Private Ltd	Bharuch Surat Highway Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Gujarat State	15	2021	Federal		2006	100	111	108.6	219.6		65	2006	Lowest subsidy required	Competitive bidding		Ideal Road Builders Ltd (.. / India), DVJ Leasing and Finance Pvt Ltd (.. / India), ATR Infrastructure (.. / India)
2006	Indore Kalghat Road Project	Oriental Pathways (Indore) Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Madhya Pradesh State	20	2026	Federal		2006	100	1.3	119.36	120.66		80	2006	Lowest subsidy required	Competitive bidding		Oriental Structural Engineers Private Ltd. (50% / India)
2006	Ircon – Soma Tollway Private Limited	Dhule-Pimpalgaon Road Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Maharashtra State	20	2026	Federal		2006	100	13	120.7	133.7		118	2006	Lowest subsidy required	Competitive bidding		Ircon International Limited (50% / India), Soma Enterprise Ltd (50% / India)
2006	Jadcherla Kothakota Road Project	Jadcherla Kothakota Road Project, L&T Western Andhra Tollways Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Andhra Pradesh State	20	2026	Federal	Fixed government payments	2006	100	0	82	82		56	2006	Lowest subsidy required	Competitive bidding		Larsen & Toubro Limited (100% / India)
2006	Jalandhar Amritsar Tollways Limited	Jalandhar Amritsar Road Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Punjab State	20	2026	Federal	Fixed government payments	2006	100	0	52.5	52.5	8.7	49	2006	Lowest subsidy required	Competitive bidding		IVRCL Infrastructures & Projects Ltd. (100% / India)
2006	Kadtal-Armur NH-7		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Andhra Pradesh	20	2026	Federal	Fixed government payments	2006	100	0	79.5	79.5	0	31	2006		Competitive bidding		Hindustan Construction Company Ltd (HCC) (100% / India)

2006	Kondhali Telegaon Road Project	Oriental Pathways (Nagpur) Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Maharashtra State	20	2026	Federal		2006	100	0	60.75	60.75		50	2006	Lowest subsidy required	Competitive bidding		Oriental Structural Engineers Private Ltd. (50% / India)
2006	Kosi Bridge NH - 57		Greenfield project	Build, operate, and transfer	Construction	Bridge and highway	State - Bihar	20	2026	Federal	Fixed government payments	2006	100	0	109.89	109.89	0	11	2006		Competitive bidding	5	Gammon India Ltd (.. / India)
2006	Kotakatta Kurnool Road Project	Andhra Pradesh Expressway Limited, APEL	Concession	Build, rehabilitate, operate, and transfer	Construction	Highway	Andhra Pradesh State	20	2026	Federal	Fixed government payments	2006	100	0	164.4	164.4		74	2006	Other	Competitive bidding		Infrastructure Leasing & Financial Services (100% / India)
2006	Krishnagiri Thopurghat Toll Road Project	L&T Krishnagiri Thopurghat Toll Road Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Tamil Nadu State	20	2026	Federal		2006	100	31	82	113		62	2006	Lowest subsidy required	Competitive bidding		Larsen & Toubro Limited (100% / India)
2006	Kumarapalayam Tollways Limited	Kumarpalayam Chengapalli Road Project, KTL	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Tamil Nadu State	20	2026	Federal	Fixed government payments	2006	100	0	93	93	3.9	49	2006	Lowest subsidy required	Competitive bidding		IVRCL Infrastructures & Projects Ltd. (100% / India)
2006	Kundli Manesar Palwal Expressway	KMP Expressway, Western Peripheral Expressway, KMP Expressways Limited	Greenfield project	Build, operate, and transfer	Construction	Bridge and highway	Haryana State	24	2029	State/Provincial		2006	100	0	422.6	422.6		135	2006	Other	Competitive bidding	5	Apollo Enterprises Limited (33% / United Kingdom), DS Constructions Ltd (67% / India)
2006	Kurali-Kiratpur NH-21		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Punjab	20	2026	Federal	Fixed government payments	2006	100	0	77	77	11	44	2006	Lowest subsidy required	Competitive bidding		B Seenaiah & Company (Projects) Ltd (51% / India), C&C Constructions Ltd (49% / India)
2006	L&T Inter-State Road Corridor Limited	Palanpur Swaroopgunj Road Project, L&T-IRCL	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Gujarat State, Rajasthan State	18	2024	Federal		2006	100	0	121	121		76	2006		Competitive bidding		Larsen & Toubro Limited (100% / India)
2006	L&T Vadodara-Bharuch Tollway Limited	L&T-VBTL, Vadodara Bharuch Highway Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Gujarat State	15	2022	Federal		2006	100	104	145.6	249.6		83	2006	Lowest subsidy required	Competitive bidding		Larsen & Toubro Limited (100% / India)
2006	Lucknow Sitapur Expressway Project	Lucknow Sitapur Expressways Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Uttar Pradesh State	20	2026	Federal	Fixed government payments	2006	100	0	99.3	99.3		75	2006	Lowest subsidy required	Competitive bidding		DS Constructions Ltd (.. / India)
2006	Meerut Muzaffarnagar Road Project	Western UP Tollway Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Uttar Pradesh State	20	2026	Federal	Fixed government payments	2006	100	0	79.5	79.5	28.2	78.3	2006	Lowest subsidy required	Competitive bidding		Gayatri Projects Ltd (40% / India), Maytas Infrastructure Pvt Ltd (30% / India), Nagarjuna Construction Company (30% / India)
2006	Mumbai Nasik Expressway Limited	Vadape Gonde Highway Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Maharashtra State	20	2026	Federal	Fixed government payments	2006	100	0	128	128	17.7	100	2006	Lowest subsidy required	Competitive bidding		B.E. Billimoria & Company Limited (.. / India), Gammon India Ltd (.. / India), Sadbhav Engineering Ltd (20% / India)
2006	Nagpur Kondhali Highway Project	Balaji Tollways Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Maharashtra State	20		Federal	Fixed government payments	2006	100	0	50	50	12.6	41	2006	Lowest subsidy required	Competitive bidding		Atlanta Limited (74% / India), SREI Infrastructure Finance Ltd (26% / India)
2006	NK Toll Road Limited	Namakkal Karur Road Project, Karur Madurai Road Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Tamil Nadu State	20	2026	Federal	Fixed government payments	2006	100	0	45.4	45.4	5.3	34	2006	Lowest subsidy required	Competitive bidding		Reliance ADA Group (100% / India)
2006	Orai Barah Highway Project	OB Infrastructure Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Uttar Pradesh State	17	2024	Federal	Fixed government payments	2006	100	0	117.3	117.3	0	63	2006	Lowest subsidy required	Competitive bidding		KMC Constructions Ltd (36% / India), Nagarjuna Construction Company (64% / India)
2006	Padalur Trichy Highway Project	Indu Navayuga Infrastructure Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Tamil Nadu State	25	2031	Federal	Fixed government payments	2006	100	0	88.3	88.3		40	2006	Lowest subsidy required	Competitive bidding		Indu Group (.. / India), Navayuga Group (.. / India)
2006	Palaspanga Bamebari Road		Concession	Rehabilitate, operate, and transfer	Operational	Highway	State - Orissa	10	2016	State/Provincial		2006	100	0	9	9	0	28	2006		Direct negotiation		Keonjhar Infrastructure Development Company Ltd (100% / India)
2006	Patiala-Malerkotla Road Project		Concession	Rehabilitate, operate, and transfer	Construction	Highway	Punjab State	17	2023	State/Provincial	Fixed government payments	2006	100	0	11.3	11.3	5.7	56	2006				IDEB Projects Private Limited (100% / India)
2006	Raipur Expressways Limited	Raipur Aurang Road Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Chhattisgarh State	25	2031	Federal	Fixed government payments	2006	100	0	63.1	63.1	1.7	45	2006	Lowest subsidy required	Competitive bidding		DS Constructions Ltd (59% / India), Apollo Enterprises Limited (40% / United Kingdom)
2006	Salem Tollways Limited	Salem Kumarapalayam Road Project, STL	Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	Tamil Nadu State	20	2026	Federal	Fixed government payments	2006	100	0	110.6	110.6	28.5	54	2006	Lowest subsidy required	Competitive bidding		IVRCL Infrastructures & Projects Ltd. (100% / India)
2006	Sandur By-Pass Road Project	Sandur Bypass Project Limited	Greenfield project	Build, operate, and transfer	Construction	Highway	Karnataka State	20	2026	State/Provincial		2006	100	0	8.8	8.8		17	2006				DS Constructions Ltd (100% / India)
2006	Thrissur Angamali Highway Project	Guruvayoor Infrastructure Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Kerala State	20	2026	Federal		2006	100	47.5	121.4	168.9		65	2006	Lowest subsidy required	Competitive bidding		SREI Infrastructure Finance Ltd (49% / India), KMC Constructions Ltd (51% / India)
		Dindigul Karur																					

2006	Ulundurpet Padalur Highway Project	Trichy Tollway Private Limited	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Tamil Nadu State	20	2026	Federal	Fixed government payments	2006	100	0	125	125	8.83	92.75	2006	Lowest subsidy required	Competitive bidding	7	IJM Corporation Berhad (50% / Malaysia), Shroopji Pallonji Group (50% / India)
2007	Aurangabad-Jalna-Jintur Project on MSH-6		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Maharashtra	20	2027	State/Provincial		2007	100	0	74	74		66	2007		Competitive bidding		PBA Infrastructure Ltd (49% / India), Sadbhav Engineering Ltd (51% / India)
2007	Bangalore Mudbagal NH – 4		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Karnataka	20	2028	Federal		2007	100		173	173	44	81	2007	Lowest subsidy required	Competitive bidding		Lanco Group (100% / India)
2007	Bhopal - Dewas road project		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Dewas, Madhya Pradesh	25	2032	Federal	Fixed government payments	2007	100	0	107	107	20	143	2007	Lowest subsidy required	Competitive bidding		BSBK Pvt Ltd (.. / India), MSK Projects (India) Ltd (.. / India), Chetak Enterprises Pvt Ltd (.. / India)
2007	Bongulur to Tukkuguda - Outer Ring Road	Hyderabad Expressways	Greenfield project	Build, operate, and transfer	Construction	Highway	Hyderabad, Andhra Pradesh	15	2022	State/Provincial	Fixed government payments	2007	100	0	73	73	18	13	2007	Lowest subsidy required	Competitive bidding		Maytas Infrastructure Pvt Ltd (50% / India), Gayatri Projects Ltd (50% / India)
2007	Chandpur - Alirajpur Kukshi Badwani Road		Concession	Rehabilitate, operate, and transfer	Operational	Highway	State - Madhya Pradesh	25	2032	State/Provincial	Fixed government payments	2007	100	0	16	16	6	100	2007	Lowest subsidy required	Competitive bidding		Keti Infrastructure Pvt Ltd (100% / India)
2007	Delhi - Ramgarh - Alwar		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Rajasthan	11	2018	State/Provincial		2007	100	0	6.32	6.32		35	2007		Competitive bidding	2	Vishesh Infrastructure Pvt Ltd (100% / India)
2007	Expressway from Narsingi to Kollur		Greenfield project	Build, operate, and transfer	Construction	Highway	State - Andhra Pradesh	15	2022	State/Provincial	Fixed government payments	2007	100	0	75	75		12	2007		Competitive bidding		Induni & Cie SA (.. / Switzerland), Era Group (.. / India)
2007	Expressway from Pedda Amberpet to Bongulur		Greenfield project	Build, operate, and transfer	Construction	Highway	State - Andhra Pradesh	15	2022	State/Provincial	Fixed government payments	2007	100	0	107	107		13	2007		Competitive bidding		KMC Constructions Ltd (.. / India), Infrastructure Leasing & Financial Services (.. / India)
2007	Gwalior Bypass on NH-3 and NH-75		Greenfield project	Build, operate, and transfer	Construction	Highway	State - Madhya Pradesh	20	2027	Federal	Fixed government payments	2007	100	0	75	75		42	2007		Competitive bidding		Era Group (.. / India), Shriram Group (.. / India), Ramky Group (51% / India)
2007	Gwalior-Jhansi NH-75		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Madhya Pradesh & Uttar Pradesh	20	2027	Federal	Fixed government payments	2007	100	0	151	151		80	2007		Competitive bidding		DS Constructions Ltd (.. / India), Apollo Infrastructure Projects Finance Company (.. / India)
2007	Islam Nagar-Kadtal NH-7		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Andhra Pradesh	20	2027	Federal	Fixed government payments	2007	100	0	137	137		48	2007		Competitive bidding		Patel Engineering Ltd (.. / India), KNR Constructions Ltd (.. / India)
2007	Jaora Nayagaon Road Project		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Madhya Pradesh	25	2032	State/Provincial	Fixed government payments	2007	100	49.92	135	184.92		126	2007	Highest price paid to government	Competitive bidding		VIVA Highways Private Ltd. (49% / India), SREI Infrastructure Finance Ltd (28% / India)
2007	Jhansi to Lalitpur (Km 0 to km 49.79) NH-26	Gayatri Jhansi Roadways	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Madhya Pradesh & Uttar Pradesh	20	2027	Federal	Fixed government payments	2007	100	0	106	106		50	2007		Competitive bidding		Gayatri Projects Ltd (51% / India), Infrastructure Development Finance Company Ltd (IDFC) (49% / India)
2007	Jhansi to Lalitpur (Km 49.79 to km 99) NH-26	Gayatri Lalitpur Roadways	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Madhya Pradesh & Uttar Pradesh	20	2027	Federal	Fixed government payments	2007	100	0	77.5	77.5		49	2007		Competitive bidding		Infrastructure Development Finance Company Ltd (IDFC) (49% / India), Gayatri Projects Ltd (51% / India)
2007	Kollur to Patancheru - Outer Ring Road	Cyberabad Expressways	Greenfield project	Build, operate, and transfer	Construction	Highway	Hyderabad, Andhra Pradesh	15	2022	State/Provincial	Fixed government payments	2007	100	0	125	125	20.25	12	2007	Lowest subsidy required	Competitive bidding		Gayatri Projects Ltd (50% / India), Maytas Infrastructure Pvt Ltd (50% / India)
2007	Lakhnadon-MP/MH Border NH-7	Four laning of Lakhnadon - Seoni on NH-7	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Madhya Pradesh	20	2027	Federal	Fixed government payments	2007	100	0	102	102		56	2007		Competitive bidding		Sadbhav Engineering Ltd (51% / India), SREI Infrastructure Finance Ltd (49% / India)
2007	Lebad Jaora Road Project		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Madhya Pradesh	25	2032	State/Provincial	Fixed government payments	2007	100	0	105	105	0	125	2007	Not Applicable	Competitive bidding		Essel Group (100% / India)
2007	Madurai - Tuticorin section - NH-45B		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Tamil Nadu	20	2027	Federal		2007	100	0	157	157	36	128	2007	Lowest subsidy required	Competitive bidding	2	SREI Infrastructure Finance Ltd (49% / India), Madhucon Projects Ltd (51% / India)
2007	Mandsaur-Sitamau Road	Road upto Rajasthan border	Concession	Rehabilitate, operate, and transfer	Operational	Highway	State - Madhya Pradesh	25	2032	State/Provincial	Fixed government payments	2007	100	0	6.3	6.3	2.5	44	2007	Lowest subsidy required	Competitive bidding	6	Suryavanshi Infrastructure Pvt Ltd (100% / India)
2007	Matkuli-Tamia-Chhindwara Road Project		Concession	Rehabilitate, operate, and transfer	Operational	Highway	State - Madhya Pradesh	25	2032	State/Provincial	Fixed government payments	2007	100	0	23.52	23.52	9.68	108	2007	Lowest subsidy required	Competitive bidding		Keti Infrastructure Pvt Ltd (100% / India)
2007	MH/AP Border to Islam Nagar NH-7		Concession	Build, rehabilitate, operate, and transfer	Operational	Bridge and highway	State - Andhra Pradesh	20	2027	Federal	Fixed government payments	2007	100	0	90.1	90.1		55	2007		Competitive bidding	13	Avinash (.. / India), Soma Enterprise Ltd (.. / India)
2007	Neelmangla-Devihalli NH-4 & NH-48		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Karnataka	25	2032	Federal		2007	100		143	143		81.8	2007	Lowest subsidy required	Competitive bidding		Lanco Group (100% / India)
2007	Nelamangala-Bangalore NH-4		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Karnataka	20	2027	Federal		2007	100	35.51	110	145.51	0	20	2007	Lowest subsidy required	Competitive bidding		Navayuga Group (100% / India)
2007	Pondicherry - Tindivanam NH-66		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Tamil Nadu	30	2037	Federal	Fixed government payments	2007	100	0	71.25	71.25	11.25	39	2007	Lowest subsidy required	Competitive bidding	3	Maytas Infrastructure Pvt Ltd (50% / India), Navayuga Group (50% / India)
2007	Salem to Karur (NH-7)		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Tamil Nadu	20	2027	Federal		2007	100	12	63	75		42	2007	Highest price paid to government	Competitive bidding		MRK Prasad Rao (.. / India), JTEC (.. / India), M Venkat Rao (.. / India)
2007	Salem-Ulundurpet NH-68		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Tamil Nadu	25	2032	Federal	Fixed government payments	2007	100	0	235.25	235.25	91.51	136	2007	Lowest subsidy required	Competitive bidding	1	Reliance ADA Group (100% / India)
2007	Second Adityapur Toll Bridge over River Kharkali	Bridge (Jamshedpur-Adityapur) Project	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Jharkhand	30	2037	State/Provincial	Fixed government payments	2007	100	0	13.75	13.75	2	3	2007	Lowest subsidy required	Competitive bidding		Infrastructure Leasing & Financial Services (100% / India)

2007	Thrissur Edapalli Project on NH-47		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Kerala	20	2027	Federal	Fixed government payments	2007	100	21.1	78.13	99.23	0	40	2007	Lowest subsidy required	Competitive bidding		KMC Constructions Ltd (51% / India), SREI Infrastructure Finance Ltd (49% / India)
2007	Trichy - Karur on NH-67		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Tamil Nadu	30	2037	Federal	Fixed government payments	2007	100	0	129	129	37	80	2007	Lowest subsidy required	Competitive bidding	2	Reliance ADA Group (100% / India)
2007	Trichy Dindigul on NH-45		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Tamil Nadu	30	2037	Federal	Fixed government payments	2007	100	0	144	144	56.58	88	2007	Lowest subsidy required	Competitive bidding	1	Reliance ADA Group (100% / India)
2007	Zirakpur-Parwanoo NH-22		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	State - Punjab, Himachal Pradesh & Haryana	20	2027	Federal	Fixed government payments	2007	100	0	73.75	73.75	29.25	29	2007	Lowest subsidy required	Competitive bidding		Jaiprakash Associates Ltd (100% / India)
2008	Ashok Highways – Bhandara Road Project (NH-6)		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Maharashtra	20	2028	Federal	Fixed government payments	2008	100		176	176		86	2008		Competitive bidding		Infrastructure Development Finance Company Ltd (IDFC) (.. / India), Ashoka Buildcon Ltd (.. / India)
2008	Chilkaluripet – Vijayawada NH - 5		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Andhra Pradesh, India	15	2023	Federal		2008	100		197	197		82.5	2008	Not Applicable	Competitive bidding		IJM Corporation Berhad (.. / Malaysia), Infrastructure Development Finance Company Ltd (IDFC) (.. / India)
2008	Gurgaon Kotputli Jaipur NH-8		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Haryana and Rajasthan	12	2020	Federal		2008	100		704	704		225.6	2008	Not Applicable	Competitive bidding		KMC Constructions Ltd (49% / India), Emirates Trading Agency LLC (51% / United Arab Emirates)
2008	Halol-Godhra-Shamlaji, Ahmedabad-Viramgam-Maliya, Rajkot-Jamnagar-Vadinar	Three four lane highways in Gujarat	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Gujarat	20	2028	State/Provincial		2008	100	682	1009	1691		493	2008	Highest price paid to government	Competitive bidding		Larsen & Toubro Limited (100% / India)
2008	Katni Bypass NH - 7		Greenfield project	Build, operate, and transfer	Operational	Highway		12	2019	State/Provincial	Fixed government payments	2008	100		14.52	14.52		35.2	2008	Lowest subsidy required	Competitive bidding		Ashoka Buildcon Ltd (99% / India)
2008	Khalghat-Borghat Highway	Khalghat-MP/Maharashtra Border	Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Madhya Pradesh	18	2026	Federal		2008	100		185	185		82.5	2008	Not Applicable	Competitive bidding		SEW Infrastructure (49% / India), Navayuga Group (51% / India)
2008	Panipat Jalandhar of NH-1		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Haryan and Punjab	15	2023	Federal		2008	100		1000	1000		291	2008	Not Applicable	Competitive bidding		Isolux (51% / Spain), Soma Enterprise Ltd (39% / India)
2008	Surat Dahisar NH-8		Concession	Build, rehabilitate, operate, and transfer	Operational	Highway	Gujarat	12	2020	Federal		2008	100		664	664		239	2008	Not Applicable	Competitive bidding		IRB Infrastructure Developers Ltd (90% / India)

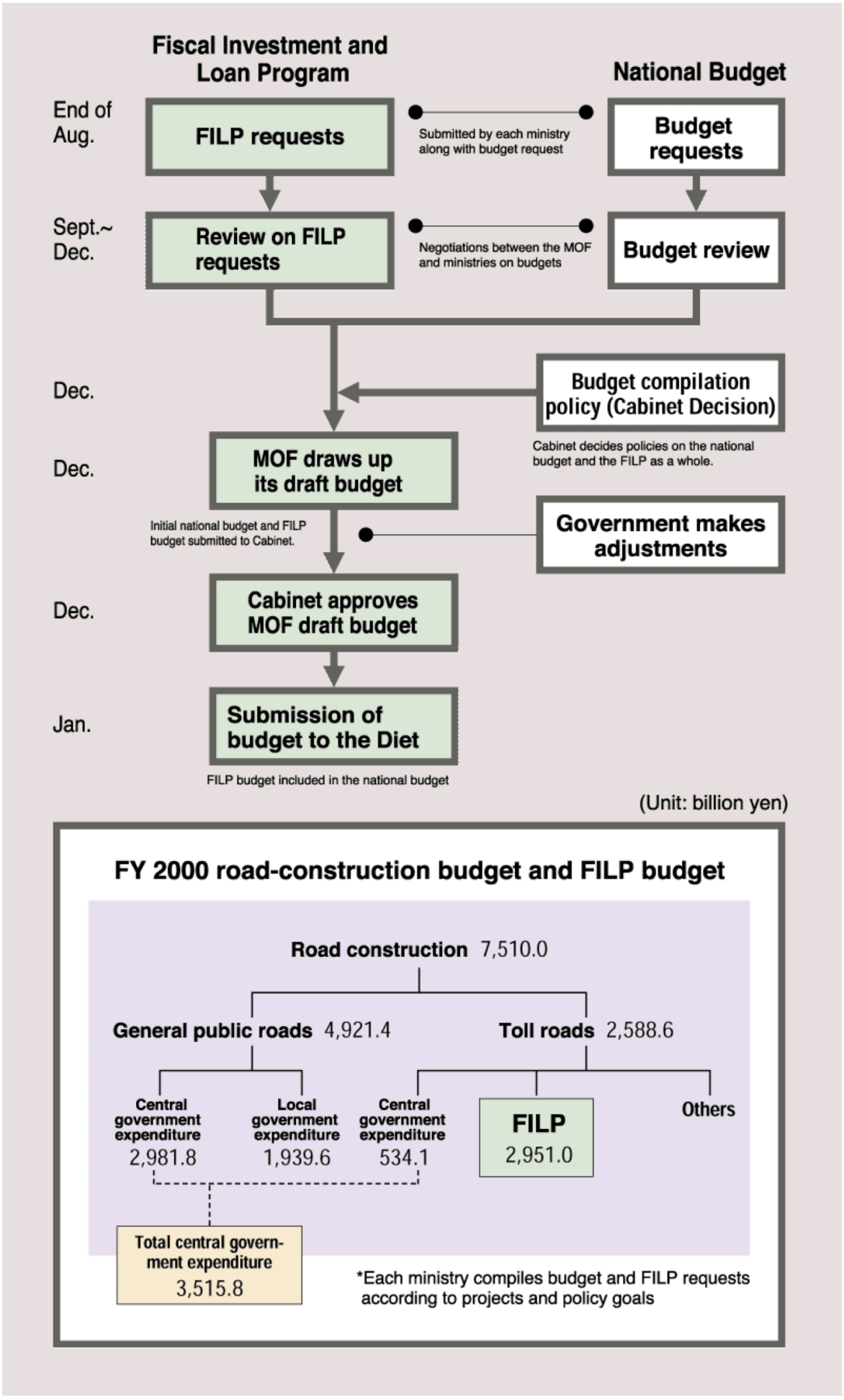
APPENDIX 8 INVESTMENT ROUTES FOR INVESTING IN INDIA, ENTRY STRATEGIES FOR FOREIGN INVESTORS

Investment Routes for Investing in India, Entry Strategies for Foreign Investors

Automatic route (does not require any prior approval either by the Government or RBI. The investors are only required to notify the Regional office concerned of RBI within 30 days of receipt of inward remittances) for specified activities subject to Sectoral cap and conditions: e.g.	
Sector	Cap
Airports • Existing • Greenfie	 74% 100%
Banking (Private Sector)	74%
Power generation, transmission, distribution	100%
Telecommunication • Basic and cellular services • ISP with gateways, radio paging, end-end bandwith • ISP without gateway (specified) • Manufacture of telecom equipment	 49% 49% 49% 100%
Prior Approval from FIPB, DEA where new investment is above Sectoral caps for activities listed below	
Sector	Cap
Existing Airports	74% to 100%
Asset reconstruction companies	49%
Investment companies in infrastructure / service sector (except telecom)	49 %
Telecommunication Basic and unified access services ISP with gateways, radio paging, end to end bandwidth ISP with gateway (specified)	 49 % to 74 % 49 % to 74 % 49 % to 100 %

List of activities or items for which automatic route for foreign investment is not available	Industries reserved for the Public Sector (GOI 1991)
• Banking • NBFC's Activities in Financial Services Sector • Civil Aviation • Petroleum Including Exploration/Refinery/Marketing • Housing & Real Estate Development Sector for Investment from Persons other than NRIs/OCBs. • Venture Capital Fund and Venture Capital Company • Investing Companies in Infrastructure & Service Sector • Atomic Energy & Related Projects • Defense and Strategic Industries • Agriculture (Including Plantation) • Print Media • Broadcasting • Postal Services	• Arms and ammunition and allied items of defence equipment, Defence aircraft and warships. • Atomic Energy. • Coal and lignite. • Mineral oils. • Mining if iron ore, manganese ore, chrome ore, gypsum, sulphur, gold and diamond. • Mining of copper, lead, zinc, tin, molybdenum and wolfram. • Minerals specified in the Schedule to the Atomic Energy (Control of Production and Use) Order, 1953. • Railway transport.
Source: http://madaan.com/fdiapprovals.html	

APPENDIX 9 FLOW CHART OF JAPANESE FISCAL INVESTMENT LOAN PROGRAM



APPENDIX 10 BUILDING BLOCKS: PRESENT & FUTURE

The construction industry is facing a shortage of skilled manpower which is expected to grow

- 70-80% of the existing workforce is untrained, which impacts the pace and quality of project implementation
- The situation is expected to worsen with infrastructure investments driving high growth in demand for skilled manpower

Most of the workforce is untrained.

Overall workforce (in million)

Annual addition to workforce	12.8
Annual vocational training capacity	3.1 (75%)

Welders

Current stock	0.9
Certified	0.25 (72%)

Several contractors have cited project hold-ups due to low availability of welders

Source: Planning Commission; World Bank report 2005; Ficci; expert interviews; McKinsey analysis

Indian providers are poor at risk assessment

Aggregate performance on risk assessment.

	Variance between estimated and actual margins (in %)	Bid-win ratio (in %)
Best-in-class global companies	2-3	40-60
India companies	6-8	20-30

- High variance between estimated and actual margins indicates inadequate/poor risk pricing and mitigation by Indian companies
- Low bid-win ratio indicates suboptimal prioritization of projects for bidding, and lack of bidding and estimation accuracy

Source: Expert interviews

The prevalence of design and engineering best practices at Indian providers is low

(average score on a scale of 4)

1. Never
2. Sometimes
3. Often
4. Always

Suboptimal (<2.7)

Define and document clear parameters which help define and measure efficiency of design	2.6
Use strong knowledge management to ensure that feedback/issues raised in previous projects are resolved in future designs	2.0
Leverage technology extensively to manage complicated designs	2.7
Have a clear design review process, which provides checks and balances to ensure accurate and efficient design	2.8
Develop a formal system of mentorship of new designers/engineers to enable "tacit" knowledge transfer	2.5

Average: 2.5

Impact on performance (average score on a scale of 4)

Continually improve designs to save cost and execution time	3.1
Clearly understand the time and cost trade-offs for any deviations made on the standard design	2.5
Designs do not require many changes after start of construction	2.2

Source: McKinsey EPC 360 survey

The prevalence of procurement best practices at Indian providers is low

(average score on a scale of 4)

1. Never
2. Sometimes
3. Often
4. Always

Suboptimal (<2.7)

Use robust forecasting mechanism to predict commodity-wise demands	2.2
Consolidate demand across BUs and geographies to negotiate and get bulk discount from suppliers	2.7
Employ sophisticated risk management techniques (e.g., forward buys)	1.9
Review and fine-tune delivery schedules based on the project status	2.9
Resolve supplier complaints in a timely and fair manner	2.4
Incentivize managers to develop long- term and mutually beneficial relationships with suppliers	2.4
Have an efficient system of supplier ratings to help maintain performance records of suppliers	2.2
Proactively look out and introduce new vendors to help induce completion	2.7
Clearly demarcate the sourcing organization between strategic sourcing and fulfilment role	2.2
Use ERP/IT-based system to create transparency and generate sourcing MIS	2.5

Average: 2.4

Impact on performance (average score on a scale of 4)

Long-term, mutually beneficial relationships with suppliers	3.0
Suppliers provide preferential rates and assured supplies all the time, e.g., even during supply constraints	2.4
Sourcing department is able to save substantial amounts year on year	2.4

Source: McKinsey EPC 360 survey

The prevalence of construction best practices at Indian providers is low

(average score on a scale of 4)

1. Never
2. Sometimes
3. Often
4. Always

Suboptimal (<2.7)

Project planning	Employ sophisticated tools, e.g., Primavera, for complete project tracking up to L4 level	2.4
	Start a project only after assigning a dedicated planning manager	2.9
	Regularly update "standard plans" for specific projects and use them as starting points to develop execution plan for similar new projects	2.2
Project execution	Conduct multi-level periodic reviews that track performance of various projects	2.6
	Use data generated by the ERP system/ Primavera, with minimal human intervention, in the project reviews	2.1
	Hold the project manager (with overall account leadership) accountable for project profitability	3.5
	Use well-defined standard operating procedures that focus on value-add and reduce process overhead	2.7
	Provide all project financials to the project manager	3.1
	Use productivity norms to continually reassess the time and resources (manpower and machinery) required for on-time completion of project	2.7

Average: 2.7

Impact on performance (average score on a scale of 4)

Our projects are completed within time	2.5
MIS system is robust enough to highlight potential time or cost overruns well before project completion	2.6
All project managers are aware of company's best practices and apply them across projects	2.5

Source: McKinsey EPC 360 survey

Construction-related cases can benefit significantly from dedicated fast-track courts

Many countries have fast-track courts for infrastructure-related cases...

- Dedicated courts for resolving infrastructure- and construction-related disputes
- The jury includes qualified judges and industry experts
- Have powers equivalent to other civil courts

... and Indian fast-track courts for other issues have done well

	Reduction in time taken to issue summons for debt recovery cases (No. of months)	Reduction in time taken to solve the motor accident claims cases (No. of months)
Australia[1] / UK[2]	Mumbai high court: 15 → Mumbai debt recovery tribunals: 4.5 (-70%)	Civil courts: 36 → Motor accident claims tribunals: 1 (-97%)

[1]Dedicated court for land acquisition cases; [2]Technology and Construction Court

Source: Expert interviews; press search

Delivery mode should be decided before tendering, on a project-by-project basis

Key levers to ensure uptake	Suggested process	Examples of countries/agencies following this approach
Pre-select the delivery mode	• Determine the delivery mode for each project prior to tendering • Take the cash vs concession decision on the basis of size—the project should be large enough to justify the transactional costs (e.g., litigation) of PPP model • Subsequently, assess the revenue potential and project's costs to decide between toll and annuity modes (where applicable), with the agency's funding constraints and VGF limits in perspective	UK, Ireland, South Korea
Optimize project scope	• Optimize the scope of the project to maximize revenue potential (e.g., include high-traffic stretches) and minimize costs (e.g., reduce number of structures)	UK
Collect and incorporate bidders' feedback	• For PPP projects, conduct one-on-one consultations with the prospective bidders, to understand their comfort with the risks involved, and their other concerns • Project scope may be changed in light of the feedback received, thus increasing the chances of a good response to the tender	Canada (Infrastructure Ontario), US (FHWA[1])

The entire process takes 1-1.5 years, and is generally done in parallel with the approvals process

[1]Federal Highways Administration

Source: International best practices; Federal Highways Administration website; expert interviews; McKinsey analysis

The quality-cum-cost-based approach should be used to select consultants, in line with global norms

Criteria for quality assessment		Cost overruns
• Performance rating (50% weightage), based on appraisals over the last three years • Technical rating (40% weightage), based on cash position; project portfolio • Bid price[1] (10% weightage)	Canada (Ontario Ministry of Transportation)	6-8%
• Technical rating includes – Performance on previous projects – Health rating, based on: sector experience of the firm; quality of staff; education and experience of personnel • Ratio of technical score-to-price quote is used to determine the winner	US (FHWA, state DOTs[2])	9%
• Technical rating includes – Experience of similar work – Approach and methodology suggested – Staffing, resume of key personnel	India	24%

- Technical rating, wherever used at final tendering stage, delivers better results
- Factoring the consultant's past performance in his technical rating makes the prequalification very robust

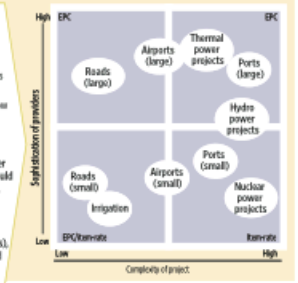
[1]10% weightage at RFP stage. Increases to 50% at RFQ stage; [2]Departments of transport

Source: Press search; expert interviews; McKinsey analysis

Sophistication of providers and complexity of projects will determine the choice between EPC and item-rate contracts

Key principles

- To capture private sector design efficiencies, design and engineering should be outsourced to provider if
  - Potential for value engineering is high (driven by complexity)
  - Probability of project failure is low (driven by provider sophistication)
  - Sufficient time is given for bid assessment
- Even in sectors where provider sophistication is low, design should be outsourced in select projects, to test and develop capabilities of providers
- In projects with high cost of failure (e.g., nuclear power, dams), design should not be outsourced to providers



Source: Expert interviews; McKinsey analysis

In the price escalation clause, the key commodities can be linked to indices that reflect the movement in their prices

Suggested index		Comments
Average of the district level prices published by Cement Manufacturers' Association (CMA)	Cement	CMA data is published on a monthly basis, draws on the prevailing market prices in each district, for several brands
Average of zonal monthly steel prices published by joint plant committee (JPC)	Steel	JPC tracks and publishes prices for all kinds of steel products (pig iron, HRC, steel wires, etc.) on a monthly basis across four major cities (New Delhi, Mumbai, Chennai, Kolkata)
Average of zonal bitumen prices published by Bharat Petroleum Corp. Ltd (BPCL) and Indian Oil Corp. Ltd (IOC)	Bitumen	BPCL and IOC publish prices for bitumen on their websites across four major cities (New Delhi, Mumbai, Chennai, Kolkata)

Source: Expert interviews; McKinsey analysis

The key objectives of a nodal agency should determine its performance metrics

US STATE DOT EXAMPLE

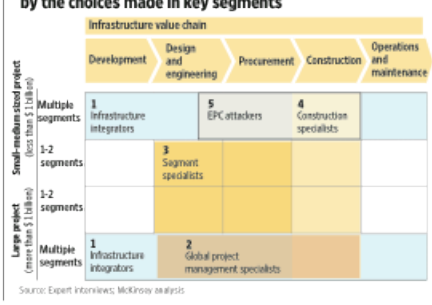
Vision: Connecting people and places—safely and efficiently, with accountability and environmental sensitivity

Objectives	Metrics	Definition of measure
Make our transportation network safer	Fatal accident (incident) rates on DOT transportation network	Number of fatal accidents on the DOT transportation system per miles travelled
Make our transportation network move people & goods more efficiently	Travel time	Average speed limit per mile, frequency of service for buses, ferries, etc.
	Congestion (level of service)	Numerical indicator of level of service experienced at peak travel times
Make our infrastructure last longer	Existing system conditions ● Road ● Bridge ● Other	Numerical indicator of quality of construction and maintenance
	Book value of transportation network	Dollar value of assets in the DOT transportation network
Make our organization a place that works well	Delivery on schedule	Percentage of projects constructed on schedule in a given year
	Delivery on budget	Percentage of projects completed on budget in a given year
Make our organization a great place to work	Employee satisfaction index	Numerical index of employee satisfaction, as determined by survey results
	Employee safety incidents	Number of safety incidents involving DOT staff while on duty

DOT: department of transport

Source: McKinsey experience in performance transformation at a state Department of Transportation in US; McKinsey analysis

The business model of providers will be defined by the choices made in key segments



Source: Expert interviews; McKinsey analysis

The capabilities to focus upon will depend on the business model adopted

Infrastructure value chain		Source of competitive advantage	Business models for construction players: Infrastructure integrators	Global project management specialists	Segment specialists	Construction specialists	EPC attackers
Development	1	Robust risk assessment	✓	✓			✓
	2	Creative project financing	✓				
Design and engineering	3	Design & engineering for complex projects	✓		✓		
	4	Value engineering		✓	✓		✓
Procurement	5	Best-practice procurement		✓	✓		✓
	6	Mega-project management		✓			
	7	Contract management	✓	✓			✓
Construction	8	High construction productivity				✓	✓
	9	Regulatory management	✓				
Operations and maintenance	10	Operational and commercial excellence	✓				

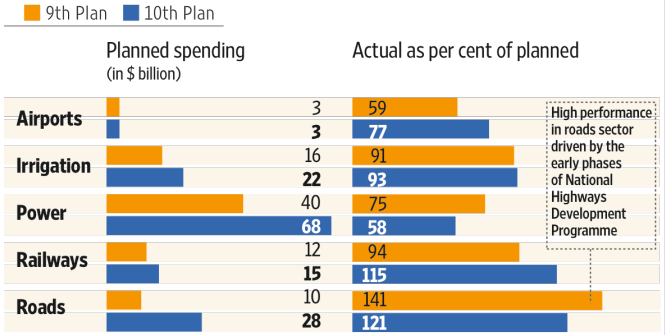
Source: Expert interviews; McKinsey analysis

Source: McKinsey & Co. report 'Building India: Accelerating Infrastructure Projects'

BUILDING BLOCKS: PRESENT & FUTURE

Infrastructure delivery has not kept pace with India's five-year Plans over the last 10 years

Planned and actual spending across sectors in 9th and 10th Plans



Source: Planning Commission; McKinsey analysis

Underperformance in infrastructure during 2008-17 will result in GDP loss of around $200 billion in FY17

This translates into 10% reduction in India's GDP[1] in FY17

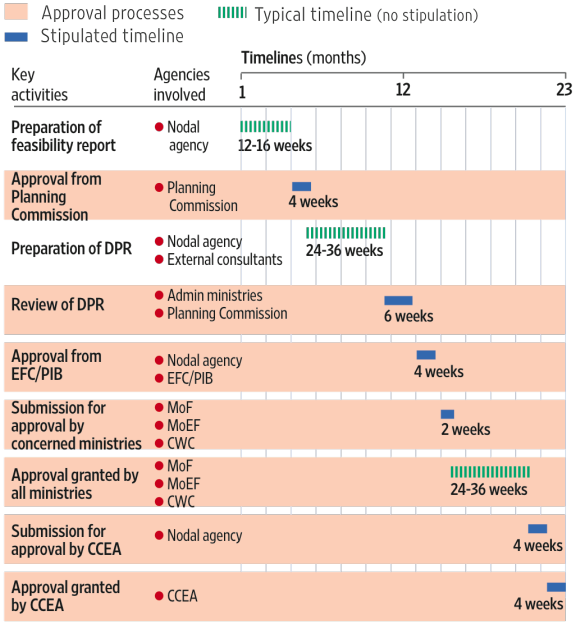
GDP loss will be equivalent to opportunity cost of...

- Around $150 in per capita income
- 30-35 million jobs in infrastructure and other dependent sectors, e.g., steel, cement
- 5-6% reduction in unemployment rate
- 3-4% of the population not being lifted above the poverty line

[1]Assumption: Gross domestic product (GDP) growth rate of 7.5% over FY08-17

Source: Global insight; Planning Commission; McKinsey analysis, 'Building India: Financing and Investing in Infrastructure, 2009'

A multitude of approvals including the required preparation adds 1-1.5 years to the pre-tendering process



EFC: external finance committee; PIB: Public Investment Board; MoF: ministry of finance; MoEF: ministry of environment and forests; CWC: cabinet working committee; CCEA: cabinet committee for economic affairs; DPR: detailed project report

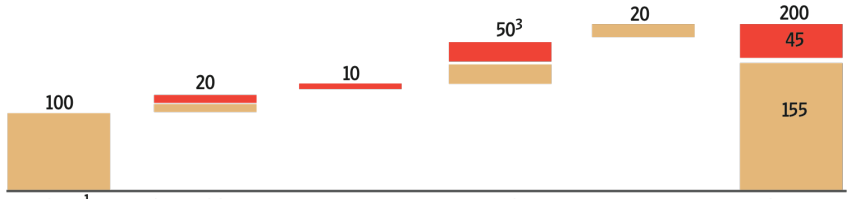
Source: Guidelines for formulation, appraisal and approval of government-funded plans: expert interviews

The causes of GDP loss spread across awarding projects, execution and securing financial closure

Break-up of total opportunity cost to GDP in FY17

(in $ billion)

- Providers
- Government, policymakers and nodal agencies



Key assumptions

- Only 70% of planned capacity is awarded
- 5% time and cost overruns due to scope changes
- 5% cost saving in case of value engineering[5]
- Optimization opportunity of 10% in procurement cost[4,5]
- 15% time and cost overrun
- 10% time and 5% cost optimization opportunity by lean construction[5]
- Only 65% of planned capacity gets financial closure

[1]Assumes that actual tendering underperformance in 2007-09, which was 30%, will continue from 2009-17. [2]As per McKinsey Building India: Financing and Investing in Infrastructure, 2009, even if there was sufficient capital, still 30% of projects would not get executed because of underperformance in tendering. Therefore, real impact due to capital constraints is 5%, not 35%. [3]Cost and time overruns on account of customer include delays in land acquisition, approvals, clearances etc; overruns due to scope changes have been included in the sub-optimal design and engineering bucket. [4]Procurement costs have been assumed to be 50% of the total project cost. [5]Assumes that savings from optimization of design, procurement and construction are reinvested in infrastructure.

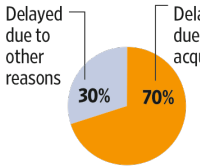
Note: All the numbers are in 2006-07 prices

Source: Global insight; industry interviews; Planning Commission; McKinsey analysis

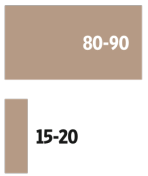
Most road projects suffer from land acquisition delays after tendering

Both the government and the industry acknowledge that land acquisition delay are rampant.

Ministry of planning study results[1]—projects delayed due to land acquisition



Construction industry survey results[2]



Start of construction without the requisite land in place leads to

- Time overruns
- Under-utilization of equipment and manpower
- Revenue loss for the developers, in case of private-public partnership projects

[1]Study commissioned by ministry of planning, Union government

[2]Survey for delays in road sector cash projects, average scores of all respondents

Source: Interviews; Web search