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# RBI STAFF STUDIES

## INFRASTRUCTURE FINANCING – GLOBAL PATTERN AND THE INDIAN EXPERIENCE

Gunjeet Kaur  
L. Lakshmanan  
Raj Rajesh  
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DEPARTMENT OF ECONOMIC ANALYSIS & POLICY

JULY 2010

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## **INFRASTRUCTURE FINANCING – GLOBAL PATTERN AND THE INDIAN EXPERIENCE**

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**Gunjeet Kaur, L. Lakshmanan, Raj Rajesh and Naveen Kumar\***

*Empirical research validates that the economic advancement of a nation critically hinges on the adequacy of infrastructure availability. It is evident that phenomenal transformation of some of the South-East Asian nations was essentially preceded by and later reinforced by quantum investments in physical and social infrastructure. This paper presents an analytical perspective on the pattern of infrastructure investment in select countries and also reflects on the Indian experience. The paper details means of financing of infrastructure in India and in this context dwells on the proactive role played by the Reserve Bank of India in the arena of infrastructure financing. The paper also examines the available financing tools, while at the same time attempts to underline innovative ways of addressing the problems for expanding avenues for timely and uninterrupted financing at competitive costs in India. The commercial aspect is also kept in view while exploring various options. The paper concludes that infrastructure financing must necessarily be provided by both public and the private sectors and emphasises the role and scope for Public Private Partnership mode of financing to achieve the desired results.*

### **Introduction**

A major area of concern for sustaining the real gross domestic product (GDP) growth in India has been lack of adequate infrastructure, which can support the growth process. The deplorably low levels of public investment have rendered India's physical infrastructure incompatible with large increases

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\* Smt. Gunjeet Kaur is Director in Department of Economic Analysis and Policy; Shri L. Lakshmanan is Assistant Adviser in Internal Debt Management Department; Shri Raj Rajesh and Shri Naveen Kumar are Research Officers in Department of Economic Analysis and Policy. The authors are grateful to Shri K.U.B Rao, Officer-in-Charge for his encouragement to prepare this paper. The responsibility of the views expressed in the paper rests solely with the authors and the usual disclaimer applies.

in the national product and clearly, without improving the rate of infrastructure investment, the overall growth rate at best would remain modest. Distinct from other large emerging market economies which are typically demand constrained, India has been, and will remain in the foreseeable future, a supply constrained economy. The biggest supply constraint is of infrastructure - physical, social and urban. It is widely recognised that poor and inadequate infrastructure is adding to production costs, denting productivity of capital and eroding competitiveness of our productive sectors (Subbarao, 2009).

The Global Competitiveness Report (GCR)<sup>1</sup> 2009-10 has stated that India ranks an outstanding 28<sup>th</sup> in the most complex areas measured by the business sophistication and innovation sub index, ahead of several advanced economies. The country also boasts of bustling financial markets (rank 16), a sound banking sector (rank 25) and fairly well functioning institutions (rank 54). On the other hand, the country underperforms on some of the basic determinants of competitiveness namely health and primary education (rank 101), macroeconomic stability (rank 96) and infrastructure (rank 76). In view of criticality of the issue of infrastructure availability, the Government of India has taken an affirmative stance and has highlighted relevance of Public Private Partnerships (PPPs) in this context.

The decisive role of the intensity of infrastructure availability in facilitating growth is not only widely recognised but is amply substantiated in the existing literature on the cross-country experience on the subject. For instance, the miraculous transformation of the economies of the South-East Asian nations such as Japan, Hong Kong, the Republic of Korea, Singapore, Thailand, Malaysia, and the People's Republic of China and Taipei were preceded and reinforced by quantum investments in physical and social infrastructure. Access to infrastructure catalyses the development process and

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<sup>1</sup> The Global Competitiveness Report, 2009-10, World Economic Forum.

makes it more inclusive. Besides, it also lays the foundations for sustainable economic growth by promoting connectivity of producers and markets, lowering transactions costs, and providing people with access to important services such as education and health care. In a nutshell, adequate provision of infrastructure contributes to enhanced productivity of business, households and government services.

Infrastructure financing in India has critical dimensions and contributes to increased investment and productivity, which is vital for an economy like India in order to sustain the uptrend in the cycle of growth. The Union Budget 2010-11 has provided resources amounting to Rs.1,73,552 crore for upgrading rural and urban infrastructure. Several initiatives have been taken to accelerate the pace of project implementation. The policy framework, especially for the PPPs, has been modified by streamlining PPP approvals in the central sector through Public Private Partnership Appraisal Committee (PPPAC), introducing viability gap funding facility, providing finance through India Infrastructure Finance Company Ltd. (IIFCL), standardising contracts to regulate terminologies related to risk, liabilities and performance standards, etc.

In the above backdrop, the rest of the paper is organised into five sections. Section I takes a note of the available literature on the subject. Section II discusses the international experiences in infrastructure development and financing; and the PPP mode of financing infrastructure in the international context. Section III examines the infrastructure financing issues in India. It studies in detail Government of India's initiatives in this regard, the evolution of the PPP arrangements, the institutional structure in place for infrastructure financing, sources of funds and the role of multilateral institutions in infrastructure development in India. Section IV highlights the initiatives and policy guidelines of the Reserve Bank of India, which over the years have facilitated financing and development of infrastructure in India. Finally, Section V offers some concluding observations.

## Section I: Literature Survey

A number of studies have found empirical support for a positive impact of infrastructure on aggregate output, especially in the developing countries. Overall, the results suggest that returns to infrastructure investment are probably the highest during the early stages of development when infrastructure is scarce and basic networks have not been completed. Returns on infrastructure investment tend to fall, sometimes sharply, as economies reach maturity, so much so that some studies in the US have even found negative effects (Briceño-Garmendia, Estache, Shafik, 2004).

In a seminal paper, Aschauer (1989) found that the stock of public infrastructure capital is a significant determinant of aggregate total factor productivity. However, the economic significance of his results was deemed implausible and found not to be robust to the use of more sophisticated econometric techniques (Holtz-Eakin, 1994; Cashin, 1995; Baltagi and Pinnoi, 1995). The recent empirical literature, mostly in cross-country panel data context, confirms the significant contribution of enhanced infrastructure availability to increases in output. It relies on increasingly sophisticated econometric techniques to address reverse causation *viz.* infrastructure may cause growth, but growth also causes firms and people to demand more infrastructure - failure to take this into account would result in over estimation of contribution of infrastructure to growth.

Roller and Waverman (2001) using data for twenty one OECD countries for over twenty years found evidence of a significant positive causal link between telecommunications infrastructure and economic growth, especially when a critical mass of telecommunications infrastructure (a level that is near universal service) is present. Similar results for roads are reported by Fernald (1999) using industry data for the US. Calderón and Servén (2003) present a similar empirical analysis with a focus on Latin America. They find positive and significant output contributions of three types of infrastructure assets – telecommunications, transport and power.



Esfahani and Ramirez (2002) report significant growth effects of infrastructure in a large panel data set in which the contribution of infrastructure is affected by institutional factors. Calderón and Servén (2004) further find a robust impact of both infrastructure quantity as well as quality on economic growth and income distribution using a large panel data set encompassing over a hundred countries and spanning over the period 1960-2000. They use a variety of specification tests to ensure that these results capture the causal impact of the exogenous component of infrastructure quantity and quality on growth and inequality.

## **Section II: International Experience in Infrastructure Financing**

### *Magnitude of infrastructure deficit across economies*

Globally, there exist significant demand supply gaps in availability of infrastructure both in the developed and developing economies. While in the developing economies, higher growth aspirations and burgeoning population pressures require augmentation of infrastructural facilities, the developed economies are grappling with the problems of high cost of re-investment to replace or modernise the ageing infrastructure. The need for improving infrastructure services in some economies has also arisen from reinforcing one's competitive position in the wake of rapid technological changes and globalisation. In some of the Emerging Market Economies (EMEs) such as India, China and Brazil, rapid growth and urbanisation has necessitated strengthening and supplementing the infrastructure services. In the Western economies, a substantial part of existing infrastructures were built in the 1960s and 1970s and have now reached a point of their life cycle where renewal and replacement is imperative. In this backdrop, globally, the investments required for rebuilding the worn-out and developing newer infrastructural services are huge (Table 1).

**Table 1: Projected Infrastructure Needs Across the World:  
Select Regions and Countries**

Country/Region	Infrastructure Spending requirement	Other Remarks
India	Approximately \$ 250 billion by 2010.	India spends just 6 per cent of its GDP annually on infrastructure.
East Asia	\$ 165 billion per year over the next five years (developing economies).	Spending is required to be channeled into electricity, telecommunications, major inter-urban roads, rail routes, water and sanitation. This amounts to 6.2 per cent of the GDP for the region- 4 per cent for investment and 2.2 per cent for maintenance.
China	\$ 132 billion.	China spends 20 per cent of its GDP on infrastructure annually. China with its enormous electricity needs is expected to account for 80 per cent of all regional infrastructure expenditure.
Europe	Energy Sector \$1.2 trillion over the next 20 years.	
Germany	\$ 832 billion by 2010.	Approximately \$ 90 billion is needed for infrastructure investment in Germany alone each year.
South Pacific	Australia \$ 19 billion; New Zealand \$ 4 billion.	
United States	\$ 1.6 trillion by 2010.	\$ 40 billion a year in roads sector alone.
California	\$ 500 billion by 2026.	
Canada	\$ 125 billion.	Local governments in Canada face \$ 60 billion annual infrastructure deficit. Needs for urban roads and bridges are placed at \$ 66 billion over 10 years period.

**Source:** Closing the Infrastructure Gap: The Role of Public-Private Partnerships, Deloitte Research Study.

### *Select Country Experiences*

#### *Canada*

The infrastructure investment deficit has been growing in many sectors in Canada. This has resulted in deteriorating infrastructure availability and

cost escalations. The longer the roads and buildings remain in a state of despair, the higher are the costs to refurbish or replace the same. Canada's infrastructure gap is estimated at anywhere in the range of \$50 billion and \$125 billion, which is 6-10 times the level of the current annual infrastructure budget of the government. If the current level of infrastructure under-investment is allowed to continue in Canada, the deficit could enlarge to \$1 trillion in sixty years. The current cost estimate to rehabilitate Canada's civil infrastructure system at the municipal level is \$57 billion, covering only 70 per cent of Canada's total civil infrastructure.

Canada has a specialised institutional set up for fostering the PPPs to bridge infrastructural gaps in the country. The Canadian Council for Public-Private Partnerships was established in 1993 as a non-partisan, non-profit body funded by members. The Canadian Council for Public-Private Partnerships fosters innovative forms of cooperation between the public sector - at the municipal, regional, provincial and federal levels - and the private sector for the benefit of the country. As a proponent of the concept of PPPs, the Council conducts research, publishes findings, facilitates forum discussions and sponsors an Annual Conference on the topics related to the PPPs, both domestic and international. As a national voice on the issue of PPPs, the Council provides support to the officials and decision-makers in investigating and developing partnerships with the private sector. The Council also strives to create opportunities for the private sector to work with the government on PPP projects that cover a spectrum of ventures, from simple contracts to full privatisations.

Taking a step further in this area, the government established *Infrastructure Canada* in August 2002. This body is a part of the Transport, Infrastructure and Communities Portfolio<sup>2</sup> of the Government of Canada. The organisation's

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<sup>2</sup> It is a ministerial portfolio headed by a Member of Parliament. Transport Canada (i.e. the Department of Transport), which was created in 1936 by the *Department of Transport Act* by merging the Department of Railways and Canals, the Department of Marine and the Civil Aviation Branch of the Department of National Defence, is its important constituent.

goal is to improve the infrastructure in the country by working with other levels of government including provincial, territorial, municipal, first nations<sup>3</sup> and the private sector. In the budget 2007, Infrastructure Canada was entrusted with the task of developing a comprehensive \$33 billion infrastructure plan for the period 2007-2014. This plan covers infrastructure investments in water, waste-water, public transit, and other key government priorities through various targeted and funding-based programs (Table 2).

Further, building on the previous infrastructure commitments, budget 2009 expanded federal investments in more modern and greener infrastructure with almost \$12 billion in new infrastructure stimulus funding over two years. It made provisions for establishing a two-year, \$4 billion ‘infrastructure stimulus fund’ that will provide funding to renew infrastructure. It has also provided for \$1 billion over five years for ‘Green Infrastructure Fund’ to support projects such as sustainable energy.

### *Australia*

Private sector involvement in the provision of infrastructure facilities and services started in Australia in the late 1980s, when the State governments

**Table 2: Infrastructure Plan of Canada - 2007-2014**

Funding	\$ Billion
1	2
Municipal GST Rebate	5.8
Gas Tax Fund	11.8
Building Canada Fund	8.8
Public-Private Partnerships Fund	1.3
Gateways and Border Crossings Fund	2.1
Asia-Pacific Gateway and Corridor Initiative	1.0
Provincial-Territorial Base Funding	2.3
<b>Total</b>	<b>33.0</b>
<b>Source:</b> Building Canada Plan. <a href="http://www.buildingcanada-chantierscanada.gc.ca">http://www.buildingcanada-chantierscanada.gc.ca</a>	

<sup>3</sup> First Nations is a term of ethnicity that refers to the aboriginal peoples in Canada.

introduced formal procedures and controls in this context. The Federal government introduced tax benefits for private financing of infrastructure through bond issues in 1992, but in late 1995, their application to urban road financing was terminated. The market was concentrated in New South Wales until 1994, when a range of private infrastructure projects across a number of States (notably Victoria) were initiated. These new private sector projects were of a substantial size and a large body of expertise in the arena has been developed since then.

The private sector projects in Australia cover a broad spectrum of infrastructure, including social infrastructure such as hospitals, prisons, transport, power and communications. Build-own-operate-transfer arrangements are the standard contracts in vogue. The process of promoting private sector participation in infrastructure has, however, not been without difficulties. Not all planned private sector infrastructure projects were accomplished successfully and practical problems such as lack of clearly defined government objectives and extensive tendering processes that vary across the States emerged as the key impediments.

Private sector participation in infrastructure development, to the extent seen in Australia, however, would not have been possible in the absence of advisory skills of the banks. These were embodied in strategic analysis, evaluation and financial modelling of projects, as well as tariff design, tax planning and liaison with the authorities. This resulted in developing a dynamic and innovative approach to funding. Banks also raised debt through the bond market and took on some debt exposure themselves. Australian banks have invested substantial resources in the development of project finance teams that meet these criteria and have set high standards. This has paid dividends in terms of results achieved and the recognition accorded to the Australian expertise overseas. A national public-private partnership forum has been established with members from the Australian government, and each State and Territory governments in order to bring a coordinated approach to the PPP arrangements.

Recently, the Australian Government adopted a new approach to planning, funding and implementing nation's future infrastructure needs. Through the enactment of 'Infrastructure Australia Act 2008', the government established 'Infrastructure Australia' on April 09, 2008. The Infrastructure Australia<sup>4</sup> has been entrusted with the responsibility of developing a strategic blueprint for nation's future infrastructure needs. It advises the Australian governments about infrastructure gaps and bottlenecks, identifies investment priorities and specifies policy and regulatory reforms that are necessary to enable timely and coordinated delivery of national infrastructure investment. In the 2008-09 Budget, the government announced establishment of a 'Building Australia Fund'. Allocations from the fund will be guided by Infrastructure Australia's national audit and infrastructure priority list.

### *Malaysia*

In the past four decades, Malaysia has witnessed a sizeable amount of investment in physical infrastructure. The government has been instrumental in infrastructure build-up encompassing air and sea ports, highways, power, water and sewerage. Complementing the huge public efforts and expenditure has been the country's extensive privatisation programme that resulted in the private sector initiatives, especially in the construction projects and provision of infrastructure services. Bulk of the private sector financing in Malaysia comes from the domestic bond market. The purpose of the bond issues includes refinancing of existing borrowings, meeting working capital requirements and acquisition of companies. During the period 1990-2005, the total infrastructure spending in Malaysia averaged 5.4 per cent of the GDP (Table 3), which is close to the average observed for developing countries.

In order to facilitate implementation of privatisation programme, the Malaysian government amended a number of laws such as the Pension Act

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<sup>4</sup> Infrastructure Australia is supported by an Infrastructure Coordinator, who leads a small professional Office of Infrastructure Coordination within the Infrastructure, Transport, Regional Development and Local Government portfolio.

**Table 3: Total Public and Private Investment in Infrastructure in Malaysia**

(RM million)						
Year	Energy	Telecom	Transport	Water & sewerage	Total	per cent of GDP
1	2	3	4	5	6	7
1990	184	2,511	1,365	533	4,593	3.9
1991	166	14	2,454	687	3,320	2.5
1992	3,605	14	2,862	1,410	7,890	5.2
1993	3,589	14	3,993	7,271	14,868	8.6
1994	8,513	1,976	7,729	2,759	20,976	10.7
1995	3,176	2,552	7,192	712	13,631	6.1
1996	509	2,608	12,110	600	15,827	6.2
1997	1,114	1,903	10,304	600	13,920	4.9
1998	509	696	6,488	600	8,292	2.9
1999	1,250	1,134	5,358	600	8,342	2.8
2000	509	1,058	8,319	15,667	25,552	7.4
2001	7,701	1,704	8,863	1,551	19,818	5.9
2002	1,039	1,925	6,264	1,611	10,839	3.0
2003	8,784	1,769	12,230	1,551	24,333	6.2
2004	5,592	4,626	7,563	11,130	28,912	6.4
2005	7,053	1,926	8,487	1,551	19,016	3.8
<b>Total</b>	<b>53,290</b>	<b>26,431</b>	<b>111,579</b>	<b>48,831</b>	<b>240,131</b>	<b>5.4</b>
<b>Private</b> (per cent)	84	97	41	70	63	63
<b>Public</b> (per cent)	16	3	59	30	37	37

**Source:** World Bank PPI Database.

(Taken from 'Report on Infrastructure Financing and Bond Issuance in Malaysia' (2007), JBICI Research Paper No. 34, April.)

1980, the Telecommunication Act 1950, the Port Act 1963, and the Electricity Act 1949. Various sectoral regulations were also introduced to facilitate privatisation and deregulation.

An important instrument of infrastructure financing in Malaysia in the last decade or so has been the project financing bonds (Table 4). On an average, infrastructure bonds accounted for 36 per cent of the total bond issuance during the period 1993 to 2006. The South East Asian Crisis of 1997-98 saw a sharp dip in the domestic bond issuances in 1998 and 1999. The bond issuance picked up sharply subsequently due partly to the corporate debt restructuring with

**Table 4: Issuance of Bonds by Infrastructure Companies and Special Purpose Vehicles (SPV)**

(RM million)							
Year	Infrastructure sector					Total	All issues in the bond market
	Power	Transport	Water	Telco			
1	2	3	4	5	6	7	
1993	1,650	0	0	0	1,650	3,364	
1994	2,261	0	0	0	2,261	5,506	
1995	0	3,065	0	0	3,065	9,201	
1996	250	2,200	0	0	2,450	12,384	
1997	2,230	0	0	0	2,230	14,623	
1998	529	0	0	0	529	10,832	
1999	0	0	0	0	0	23,350	
2000	1,619	1,505	3,542	0	6,666	21,992	
2001	9,420	3,495	547	700	14,162	31,502	
2002	945	8,913	300	1,100	11,258	26,660	
2003	10,995	5,950	350	8,029	25,324	42,790	
2004	4,427	1,170	3,943	100	9,640	28,050	
2005	8,289	7,253	3,195	460	19,197	35,656	
2006	2,401	5,435	1,808	292	9,936	31,737	
<b>Total</b>	<b>45,016</b>	<b>38,986</b>	<b>13,685</b>	<b>10,681</b>	<b>108,368</b>	<b>297,648</b>	

**Source:** Compiled from Bondweb Malaysia and RAM Bond Market databases.  
(Taken from 'Report on Infrastructure Financing and Bond Issuance in Malaysia' (2007), JBICI Research Paper No. 34, April.)

substitution of short-term bank borrowings and bond facilities with long tenured bonds to address the funding and maturity mismatches that caused financial distress to infrastructure companies during the crisis period. The power sector was the largest issuer with the total value issued amounting to 41.5 per cent of the total amount issued during 1993 to 2005. Transport remained the second largest with 36.0 per cent of the total issue value, while water and telecommunications accounted for the remaining 12.6 per cent and 9.9 per cent, respectively.

Apart from the bond market, other sources of finance available to infrastructure projects in Malaysia range from internal funds, equity and debt



financing to bank loans, grants, government budgets and development financial institutions (DFIs). Further, multilateral agencies such as the World Bank and the Asian Development Bank have been actively involved in infrastructure development in Malaysia. The Japan Bank for International Cooperation (JBIC) has also made significant contributions towards infrastructure financing.

### *China*

Since the year 1998 China has invested heavily in the economic infrastructure. Infrastructure investment initially took place in the Special Economic Zones (SEZs) and was concentrated heavily on the build-up of port capacity and road transport links in a few select harbour cities. The significant improvement of economic infrastructure in the coastal urban areas in the 1980s and the policy to allow rural labour to enter urban labour markets made these areas highly competitive in attracting manufacturing FDI, setting the precedence for the subsequent waves of infrastructure investment. In sharp contrast to other East Asian countries where infrastructure investment dropped dramatically as a result of the Asian financial crisis, the annual capital expenditure on transport, electricity, piped gas, telecommunications, urban water supply and sanitation increased steadily in China from US\$39 billion in 1994 to US\$88 billion in 1998, and further to US\$123 billion (about 8.7 per cent of the GDP) in 2003.

Various sources of finance for Chinese infrastructure projects included provincial and local governments, state development banks, Chinese international corporations, multilateral agencies and Australian bilateral aid. In the mid 1990s, the overseas entities played a vital role in infrastructure financing, though in recent years, the contribution of foreign investment in funding infrastructure projects is again on a decline. Infrastructure projects in China are funded predominantly from the domestic sources but the state budget allocations to infrastructure projects have declined substantially over the last two decades or so (Table 5).

**Table 5: Sources of Funds of Total Investment in Fixed Assets in China**

(Per cent of total)						
Year	1981	1985	1990	1995	2000	2006
1	2	3	4	5	6	7
State budget allocations	28.1	16.0	8.7	3.0	6.4	3.9
Domestic loans	12.7	20.1	19.6	20.5	20.3	16.5
Foreign Investment <sup>1</sup>	3.8	3.6	6.3	11.2	5.1	3.6
Self-raising funds <sup>2</sup> and others	55.4	60.3	65.4	65.3	68.2	76.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

**Notes:** 1. Foreign funds include borrowings, foreign aid receipts and foreign direct investment.  
2. Self-raised funds are retained earnings and other funds raised directly by enterprises.

**Source:** National Bureau of Statistics of China.

Provincial and local governments in China can raise funds for infrastructure development through borrowings; user charges, surcharges and *quasi* taxes; and retained earnings apart from other self-generated funds. Retained earnings and other self-generated funds account for a large proportion of infrastructure funding at the provincial and local government levels. However, the ability of different sectors to generate funds for investment varies considerably. China's 1994 Budget Law forbids the provincial and local governments from borrowing directly from the market in view of its negative consequences for macroeconomic management. However, the local governments borrow through the enterprises under their control, thereby incurring contingent liabilities.

The Chinese government changed the structure of the banking system in 1994 and separated 'policy' lending (for key projects, mostly infrastructure) from commercial lending. The government established three development banks reporting to the State Council namely the State Development Bank, the Export-Import Bank and the Agriculture Development Bank. The State Development Bank's responsibilities include intermediating foreign loans issuing bonds for hard loans and making budget allocations for soft loans. It lends mainly to the large and medium sized projects. The Ministry of Finance disburses funds to the State Development Bank in line with the project implementation progress. The State Development Bank places bonds with other banks and Urban Credit

Cooperatives to tap into their deposits, in effect extracting resources through the route of ‘reserve requirement’. The bonds are placed with specialised and provincial commercial banks on the basis of their excess reserves.

Further, various Ministries, Councils, banks, and regulatory bodies are engaged in a host of activities relating to coordination, planning, consultation, organisation, and implementation of infrastructure projects. Also a number of Chinese corporations have established affiliates in various countries to raise funds from the international capital markets, mainly in Hong Kong and New York. These entities play an increasingly important role in China’s infrastructure project financing.

The World Bank and the Asian Development Bank contribute substantially towards development of infrastructure in China. Their objectives are to support economic adjustment and social development, which would otherwise go unfunded. The World Bank funds activities in many sectors, including environment and infrastructure, and the Asian Development Bank focuses primarily on large infrastructure projects.

## **II.2 Public-Private Partnership Mode of Financing Infrastructure**

Historically, in many countries, such as the US, private companies built and operated infrastructures. Gradually, governments became the main provider of infrastructure facilities on account of following considerations. First, infrastructures are usually subject to economies of scale and thus are best produced and delivered by monopolies. Since private monopolies may not produce socially optimal output, governments need to regulate the private monopolies, and the regulation cost may be too high. Second, some infrastructures may have external effects (spillover benefits to the parties who do not pay for the projects), and thus, the private rate of return is smaller than the social rate of return. In this case, infrastructure provision may be unprofitable and private enterprises may not be willing to provide the infrastructures. Third, environmental consequences and safety issues of infrastructure provision are unlikely to be fully anticipated and incorporated in the market allocations.

Fourth, infrastructure projects usually involve large investments that would be difficult for private firms to raise. Fifth, private provisions may deprive the poor from getting needed infrastructure services. Governments often redistribute income through the provision of infrastructures. Sixth, it would be difficult for private firms to have a nationwide and long-run planning on infrastructure constructions. All these factors justify the argument that the governments should be infrastructure providers. In the last decade or so, however, private sector financing for infrastructure projects has gained sanction and picked up momentum. In general, however, three principal forms of finance for infrastructure service delivery can be identified: a) public finance; b) corporate finance; and c) project finance (Box 1).

### Box 1: Forms of Infrastructure Finance

There are three principal forms of finance for infrastructure service delivery: 1) public finance; 2) corporate finance; and 3) project finance. In industrialised countries public finance consists of government providing equity financing (seed capital, in China's terms) through general budget reserves, earmarked reserves, self-raised funds (*e.g.* licensing fee, and sale, rental or leasing of government assets), and inter-governmental grants and fiscal transfers. Debt financing in the public finance 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. In some cases, public debt financing is guaranteed by governments either explicitly or implicitly.

Corporate finance consists of corporations providing equity financing through retained earnings and shareholders' equity. Debt financing takes the form of commercial bank borrowing, subordinated debt (including convertible debentures and preferred stocks), privately-placed borrowing, and issuance of fixed income securities. These securities can be short-term in the form of commercial paper, or of longer durations in the form of corporate bonds. Debt is secured through collateralisation of corporate assets and assignments of receivables. Much of the infrastructure-related debt incurred in recent years by State Owned Corporations in China has been through commercial bank borrowings. However, unlike in industrialised countries, much of this debt is implicitly guaranteed by governments, and is not fully collateralised from corporations' own assets.

Project finance consists of government, corporations and PPP financing investments solely through the revenue stream of the infrastructure projects without taking recourse to government guarantees. Most project finance is made available by project-specific companies (often called the 'project company') with equity held by sponsors. Equity takes the form of sponsor investment in share capital of the project company. Debt is fully secured through the revenue stream of the infrastructure project; this stream is assigned to lenders through security agreements with trustees and does not appear on sponsor companies' balance sheets. Debt financing usually takes the form of a combination of bank loans (usually syndicated for large projects), sponsor loans, subordinated loans, suppliers' credits, and bonds of the project company. Corporate and project finance is clearly applicable only to private and club goods type of infrastructure for which there is sufficient revenue stream that can be legally collateralised to lenders.

<b>Box 2: Potential Sources of Efficiencies from PPPs</b>		
Type	Definition	Examples
Resource Allocation Efficiencies	Efficiencies are gained from the private sector's ability to allocate resources more effectively.	The private sector's motivation is on the completion of the project to a set of performance standards. Conversely, the public sector will have competing interests for operating resources, which may reduce the performance of the project over its life-cycle.
Production Efficiencies	Resources for a specific application can also be used more effectively; The ability to be more productive is developed during the private sector organization's years of practice delivering similar projects.	The construction and operation of infrastructure may be completed in less time and/or lower overall cost by using market-tested techniques and incentives for innovation.
Economic and Social Efficiencies	Access to more capital allows more projects to be funded on a fixed capital budget; Social benefits of infrastructure accrue faster as infrastructure is built sooner.	More efficient movement of goods and people; Improved quality of life resulting from increased access to infrastructure.

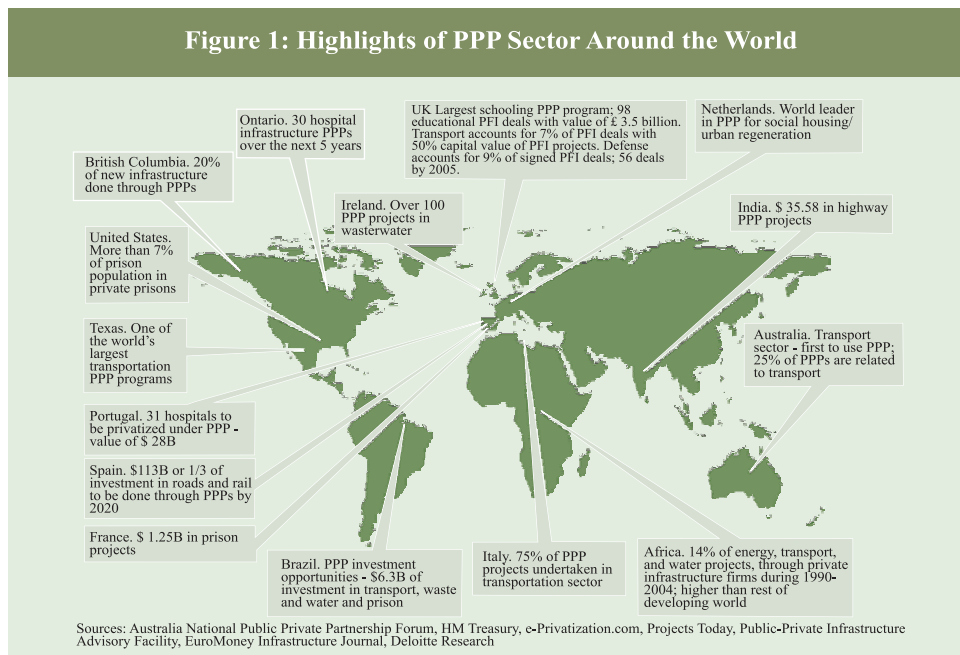
A PPP refers to a contractual arrangement between a government agency and a private sector entity that allows for greater private sector participation in the delivery of public infrastructure projects through concession agreements which lay down the performance obligations to be discharged by the concessionaire<sup>5</sup>. In comparison with the traditional models, the private sector in the PPP model assumes a greater role in planning, financing, design, construction, operation and maintenance of public facilities. Project risk is transferred to the party best positioned to manage the same. PPP projects have been found to be sources of various efficiencies such as resource allocation efficiency, production efficiency, and economic and social efficiency (Box 2).

### **International Experience in the PPPs**

In recent years, PPP has emerged as a preferred mode of funding infrastructure (Figure 1). Factors which facilitate development of PPPs include local geography, political climate, the sophistication of the capital market, forces

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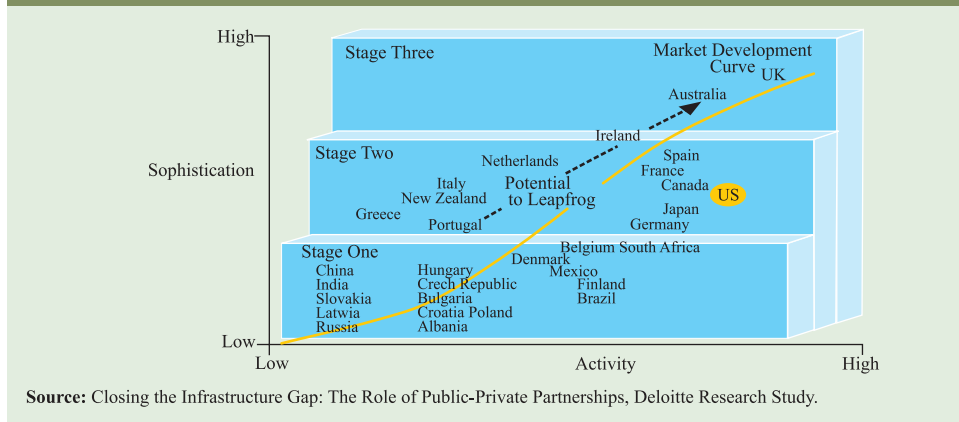
<sup>5</sup> Compendium of PPP projects in Infrastructure (March, 2010), Planning Commission.



driving formation of partnerships and factors enabling their creation. Nevertheless, countries remain at vastly different stages of understanding and sophistication in using innovative partnership models. Each country and individual states take their own path in developing infrastructure PPPs. Nonetheless, three distinct stages of PPP maturity can be observed across the world (Figure 2).

Most of the EMEs such as Brazil, China, South Africa, India, and Russia are at stage I of the PPP market maturity curve. In this initial stage, the countries establish policy and legislative framework along with an institutional set-up to guide the implementation of projects. Even in the US, many states and localities are still at the first stage of PPP development, *i.e.*, designing the partnership policy and legislative framework, getting the procurements and contracts right and building the market place by encouraging the private sector to bid on these kinds of contracts. The governments at early stages of PPP maturity curve could benefit from the opportunity to learn from the trailblazers

**Figure 2: PPP Market Maturity Curve in the Global Economy**



who have moved to more advanced stages, *e.g.*, the United Kingdom for schools, hospitals and defence facilities; Australia and Ireland for roads, *etc.* States and localities can avoid some of the mistakes often made in earlier stages of maturity, such as the tendency to apply a one-size-fits-all model to all infrastructure projects and they can adopt some of the more flexible, creative and tailored PPP approaches now being used in pioneer countries (Box 3).

Countries in stage II establish dedicated PPP units in agencies and begin developing new hybrid delivery models. In this stage, the PPP market gains depth and its use is expanded to multiple projects and sectors. Countries also leverage new sources of funds from capital markets. Countries such as Australia and the UK are in the stage III of PPP market maturity curve. In this stage, countries refine innovative models, use more sophisticated risk models with a greater focus on total lifecycle of the projects and develop advanced infrastructure market with the participation of pension funds and private equity funds.

### *Benefits of PPP model*

Globally, PPPs have shown significant promise in assisting governments to address infrastructure shortages. First, they provide new sources of capital

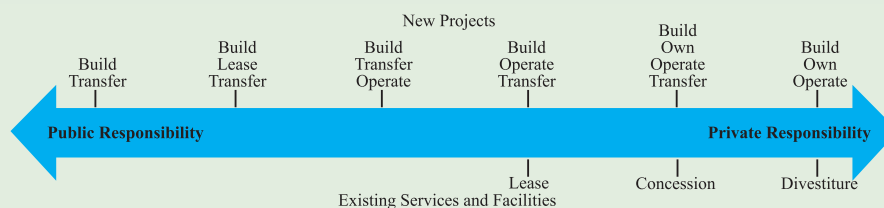
### Box 3: Some Common Models of PPP

- (i) **Build-Transfer (BT):** Under this model, the government contracts with a private partner to design and build a facility in accordance with the requirements set by the government. Upon completion, the government assumes responsibility for operating and maintaining the facility. This method of procurement is sometimes called Design-Build (DB).
- (ii) **Build-Lease-Transfer (BLT):** This model is similar to Build-Transfer, except that after the facility is completed it is leased to the public sector until the lease is fully paid, at which time the asset is transferred to the public sector at no additional cost. The public sector retains responsibility for operations during the lease period.
- (iii) **Build-Transfer-Operate (BTO):** Under this model, the private sector designs and builds a facility. Once the facility is completed, the title for the new facility is transferred to the public sector, while the private sector operates the facility for a specified period. This procurement model is also known as Design-Build-Operate (DBO).
- (iv) **Build-Operate-Transfer (BOT):** This model combines the responsibilities of Build-Transfer with those of facility operations and maintenance by a private sector partner for a specified period. At the end of the period, the public sector assumes operating responsibility. This method of procurement is also referred to as Design-Build-Operate-Maintain (DBOM).
- (v) **Build-Own-Operate-Transfer (BOOT):** Here the government grants a private partner a franchise to finance, design, build and operate a facility for a specific period of time. Ownership of the facility goes back to the public sector at the end of that period.
- (vi) **Build-Own-Operate (BOO):** In this model, the government grants a private entity the right to finance, design, build, operate and maintain a project. This entity retains ownership of the project.
- (vii) **Design-Build-Finance-Operate/Maintain (DBFO, DBFM or DBFO/M):** Under this model, the private sector designs, builds, finances, operates and/or maintains a new facility under a long-term lease. At the end of the lease term, the facility is transferred to the public sector.

*In addition to being used for new projects, PPPs can also be used for existing services and facilities. Some of these models are described below.*

- a) **Lease:** The government grants a private entity a leasehold interest in an asset. The private partner operates and maintains the asset in accordance with the terms of the lease.
- b) **Concession:** The government grants private entity exclusive rights to provide, operate and maintain an asset over a long period in accordance with performance requirements set out by the government. The public sector retains ownership of the asset, but the private operator retains ownership over any improvements made during the concession period.
- c) **Divestiture:** The government transfers all or part of an asset to the private sector. Generally, the government includes certain conditions on the sale to require that the asset be improved and services be continued.

**Figure : Public and Private Sector Responsibilities in New Projects**



**Source:** Closing the Infrastructure Gap: The Role of Public-Private Partnerships, Deloitte Research Study.



for public infrastructure projects. Second, such projects progress on schedule and within the budget, since the payments in PPP projects are better aligned to meet the project objectives. For instance, in Canada, Terminal 3 at the Toronto Pearson Airport was completed 18 months ahead of schedule under a PPP contract. Third, PPP projects often lead to cost savings in several forms such as lower construction costs, reduced life-cycle maintenance costs, and lower costs of associated risks. The savings typically result from innovation in design and better defined asset requirements. Fourth, PPP projects result in better customer service. This is because of the fact that private sector infrastructure providers, often relying on user charges from customers for revenue have strong incentives to focus on providing superior customer service.

Currently, a number of countries both from developed and developing world are employing PPP mode of infrastructure development in a number of sectors such as transport, water resources, defence, education, and hospitals. Some of the challenges faced by these economies in various infrastructure segments range from uncertainty on demand side, supply side constraints, escalating costs and political sensitivity (Table 6).

Table 6: PPP Models and Lead Practitioners in various Infrastructure Sectors ( <i>Contd.</i> )			
Sector	Leading Practitioners	Main PPP Models Employed	Challenges
Transport	Australia, Canada, France, Greece, Ireland, Italy, New Zealand, Spain, UK, US	DBOM, BOOT, Divestiture	<ul style="list-style-type: none"> <li>✓ Demand uncertainty;</li> <li>✓ Supply market constraints;</li> <li>✓ Opposition to tolls transportation network impacts competing facilities.</li> </ul>
Water, wastewater, and waste	Australia, France, Ireland, UK, US, Canada	DB, DBO, BOOT, Divestiture	<ul style="list-style-type: none"> <li>✓ Upgrading costs and flexibility;</li> <li>✓ Uncertainty about technology and need for innovation;</li> <li>✓ High procurement costs for small-scale projects;</li> <li>✓ Political sensitivity around privatization concerns.</li> </ul>

**Table 6: PPP Models and Lead Practitioners in various Infrastructure Sectors (Concl.)**

Sector	Leading Practitioners	Main PPP Models Employed	Challenges
Education	Australia, Netherlands, UK, Ireland	DB, DBO, DBOM, BOOT, DBFO/M, integrator	<ul style="list-style-type: none"> <li>✓ High cost due to uncertainty about alternative revenue streams</li> <li>✓ High procurement costs for small projects</li> <li>✓ Uncertainty about future demographic or policy changes.</li> </ul>
Housing/urban regeneration	Netherlands, UK, Ireland	DBFM, joint venture	<ul style="list-style-type: none"> <li>✓ Refurbishment costs and flexibility</li> <li>✓ Uncertainty about future demand and revenue streams</li> <li>✓ Joint delivery.</li> </ul>
Hospitals	Australia, Canada, Portugal, South Africa, UK	BOO, BOOT, integrator	<ul style="list-style-type: none"> <li>✓ Uncertainty about future public health care needs</li> <li>✓ High transaction costs in small-scale projects</li> <li>✓ Political sensitivity around privatization concerns.</li> </ul>
Defense	Australia, Germany, UK, US	DBOM, BOO, BOOT, alliance, joint venture	<ul style="list-style-type: none"> <li>✓ Uncertainty about future defense needs;</li> <li>✓ Rate of technological change;</li> <li>✓ High upfront costs in small-scale projects;</li> <li>✓ Securing value for money in non-competitive situations?</li> </ul>
Prisons	Australia, France, Germany, UK, US	DB, DBO, BOO, management contract	<ul style="list-style-type: none"> <li>✓ Political sensitivity;</li> <li>✓ Public purpose issues;</li> <li>✓ Specifying outcomes</li> </ul>

**Source:** Closing the Infrastructure Gap: The Role of Public-Private Partnerships, Deloitte Research Study.

### Section III: Infrastructure Financing in India: Institutional Structure, Issues and Policy Perspectives

Infrastructure financing in India has emerged as a much debated theme in the context of aspiration of policy makers to achieve sustained high economic growth, an objective which hinges entirely on the success or failure

of the authorities to provide adequate infrastructure. The prime constraint in accomplishing rapid growth in the years ahead is likely to be the lack of vital physical infrastructure and its inferior quality as compared with the competitor nations. The need to address the constraints to infrastructure development has, therefore, become stronger than ever before. The deficit in road-networks, ports, railways, airports, non-availability of uninterrupted supply of electricity and deficiencies in various types of urban infrastructure must be overcome in the medium-term to maintain the desired growth momentum. The key issue is, however, that while the need exists, how would infrastructure projects get financed?

### **III.1 Eleventh Five Year Plan: The Agenda**

The Eleventh Five Year Plan (2007-08 to 2011-12) aims at sustaining the real GDP growth rate at 9 per cent, while advocating a broad-based and inclusive approach that would improve the quality of life and reduce disparities across regions and communities. Towards this end, an ambitious programme of infrastructure investment, involving both public and private sector, has been sketched out for the Plan period. The programme endeavours to strengthen and consolidate recent infrastructure related initiatives, such as Bharat Nirman for building rural infrastructure; the sectoral initiatives such as National Highways Development Programme (NHDP), Airport Financing Plan, National Maritime Development Programme and Jawaharlal Nehru National Urban Renewal Mission (JNNURM). The investment requirement for infrastructure is estimated at US\$ 514.04 billion for the Plan period (the Rupee equivalents are reflected in Table 7). The Eleventh Plan document has also outlined the infrastructure deficits in specific sectors which are to be bridged during the plan period (Box 4). Further, Planning Commission has recently set quarterly monitorable targets for investment in infrastructure.

**Table 7: Infrastructure Investment in the Eleventh Plan based on sectoral analysis (Bottom-up)**

(Rs. crore at 2006-07 prices)		
Sectors	Rs. crore	Sectoral shares (%)
1	2	3
Electricity (incl. NCE)	666,525	32.4
Roads and bridges	314,152	15.3
Telecom	258,439	12.6
Railways (incl. MRTS)	261,808	12.7
Irrigation (incl. Watershed)	253,301	12.3
Water Supply and Sanitation	143,730	7.0
Ports	87,995	4.3
Airports	30,968	1.5
Storage	22,378	1.1
Gas	16,855	0.8
<b>Total</b>	<b>2,056,151</b>	<b>100.0</b>

**Source:** Planning Commission.

### III.2 Public and Private Sector share in infrastructure

The private sector has exhibited increasing interest in infrastructure investment in India. Resultantly, the relative shares of public and private investment in total infrastructure investment during the Eleventh Plan are projected to be about 70 per cent and 30 per cent, respectively (Table 8) as compared with 80 per cent and 20 per cent, respectively during the Tenth Plan. It is interesting to note that private sector is anticipated to take up projects in telecommunications, ports and airports and private investment is envisaged to constitute more than 60 per cent of total investment in these sectors during the Eleventh Plan. For the power sector, the investment is expected to rise to 28 per cent and for the road sector to 34 per cent.

The prominent role of private sector in infrastructure financing is based on the following considerations:

- i. **Cost Efficiency:** Privately managed projects are likely to have a better delivery network for services, which are cheaper and of superior quality.

#### Box 4: Infrastructure Deficit and Eleventh Plan Physical Targets

Sector	Deficit	Eleventh Plan Targets
Roads/Highways	65590 km of NH comprise only 2 per cent of network; carry 40 per cent of traffic; 12 per cent 4-laned; 50 per cent 2-laned; and 38 per cent single-laned	6-lane 6500 km in GQ; 4-lane 6736 km NS-EW; 4-lane 20000 km; 2-lane 20000 km; 1000 km Expressway
Ports	Inadequate berths and rail/road connectivity	New capacity: 485 m MT in major ports; 345 m MT in minor ports
Airports	Inadequate runways, aircraft handling capacity, parking space and terminal building	Modernize 4 metro and 35 non-metro airports; 3 greenfield in NER; 7 other greenfield airports
Railways	Old technology; saturated routes; slow speeds (freight: 22 kmph; passengers: 50 kmph); low payload to tare ratio (2.5)	8132 km new rail; 7148 km gauge conversion; modernize 22 stations; dedicated freight corridors
Power	13.8 per cent peaking deficit; 9.6 per cent energy shortage; 40 per cent transmission and distribution losses; absence of competition	Add 78577 MW; access to all rural households
Irrigation	1123 BCM utilizable water resources; yet near crisis in per capita availability and storage; only 43 per cent of net sown area irrigated	Develop 16 mha major and minor works; 10.25 mha CAD; 2.18 mha flodd control
Telecom/IT	Only 18 per cent of market accessed; obsolete hardware; acute human resources' shortages	Reach 600 m subscribers- 200 m in rural areas; 20 m broadband; 40 m Internet
<b>Source:</b> Eleventh Five Year Plan Document, Planning Commission.		

- ii. **User Charges:** The infrastructure project benefits do not percolate uniformly among the masses in the country. It is, therefore, appropriate to impose user charges in order to recover the cost of providing these services directly from the users rather than from the country as a whole (the latter is the effect if the government builds the project from its own pool of resources). If users are charged a fair price, the project acquires a purely commercial character with the government playing the role only of a facilitator.

**Table 8: Projected Investment in Infrastructure during Eleventh Five Year Plan**

(Rs. crore at 2006-07 prices)

Sector	Tenth Plan (Anticipated Expenditure)	Eleventh Plan					Total 11 <sup>th</sup> Plan	Share (%)
		2007-08	2008-09	2009-10	2010-11	2011-12		
		(Projected)						
<b>Electricity</b>								
<b>(incl. NCE)</b>	<b>291850</b>	<b>81954</b>	<b>101553</b>	<b>126380</b>	<b>158027</b>	<b>198611</b>	<b>666525</b>	
Centre	102463	37808	43469	49989	57631	66420	255316	38.3
States	97553	20978	29729	41357	56670	76963	225697	33.9
Private	91834	23168	28355	35034	43726	55228	185512	27.8
<b>Roads and Bridges</b>	<b>144892</b>	<b>51822</b>	<b>54789</b>	<b>59200</b>	<b>68370</b>	<b>79971</b>	<b>314152</b>	
Centre	71534	18318	19446	20673	22618	26304	107359	34.2
States	66354	17534	18150	18889	20613	24815	100000	31.8
Private	7004	15970	17193	19638	25140	28852	106792	34.0
<b>Telecom</b>	<b>103365</b>	<b>31375</b>	<b>38134</b>	<b>48593</b>	<b>61646</b>	<b>78690</b>	<b>258434</b>	
Centre	49013	13525	14037	16061	17728	19401	80753	31.2
Private	54352	17850	24098	32532	43918	59289	177686	68.7
<b>Railways</b>								
<b>(incl. MRTS)</b>	<b>119658</b>	<b>34225</b>	<b>40964</b>	<b>49525</b>	<b>60393</b>	<b>76701</b>	<b>261808</b>	
Centre	108950	25925	31176	37974	46685	59693	201453	76.9
States (MRTS)	10402	1575	1788	1979	2170	2489	10000	3.8
Private	307	6725	8000	9572	11537	14519	50354	19.2
<b>Irrigation</b>								
<b>(incl. Watershed)</b>	<b>111503</b>	<b>27497</b>	<b>35916</b>	<b>47189</b>	<b>62266</b>	<b>80433</b>	<b>253301</b>	
Centre	13617	3367	4006	4782	5726	6879	24759	9.8
States	97886	24130	31911	42407	56540	73554	228543	90.2
<b>Water Supply and Sanitation</b>	<b>64803</b>	<b>19298</b>	<b>22781</b>	<b>27323</b>	<b>33266</b>	<b>41063</b>	<b>143730</b>	
Centre	42316	5152	6411	7991	9976	12474	42003	29.2
States	21465	13500	15558	18308	21995	26945	96306	67.0
Private	1022	646	812	1024	1295	1645	5421	3.8
<b>Ports</b>	<b>14071</b>	<b>12409</b>	<b>14822</b>	<b>17374</b>	<b>19980</b>	<b>23410</b>	<b>87995</b>	
Centre	2185	4898	5698	6243	6350	6700	29889	34.0
States	1530	598	658	724	796	850	3627	4.1
Private	10356	6913	8466	10407	12833	15860	54479	61.9
<b>Airports</b>	<b>6771</b>	<b>5208</b>	<b>5520</b>	<b>5904</b>	<b>6646</b>	<b>7690</b>	<b>30968</b>	
Centre	3823	1146	1369	1894	2205	2674	9288	30.0
States	12	50	-	-	-	-	50	0.2
Private	2936	4012	4151	4010	4441	5016	21630	69.8
<b>Storage</b>	<b>4819</b>	<b>3777</b>	<b>4098</b>	<b>4446</b>	<b>4824</b>	<b>5234</b>	<b>22378</b>	
Centre	577	755	820	889	965	1047	4476	20.0
States	866	1133	1229	1334	1447	1570	6713	30.0
Private	3377	1888	2049	2223	2412	2617	11189	50.0
<b>Gas</b>	<b>9713</b>	<b>2708</b>	<b>3003</b>	<b>3332</b>	<b>3700</b>	<b>4111</b>	<b>16855</b>	
Centre	8713	1714	1874	2049	2240	2450	10327	61.3
Private	1000	995	1129	1283	1460	1661	6528	38.7
<b>Total</b>	<b>871445</b>	<b>270273</b>	<b>321579</b>	<b>389266</b>	<b>479117</b>	<b>595913</b>	<b>2056150</b>	
Centre	403189	112608	128305	148545	172123	204041	765622	37.2
States	296068	79499	99022	124998	160232	207186	670937	32.6
Private	172188	78166	94252	115724	146762	184687	619591	30.1

Source: Eleventh Five Year Plan Document, Planning Commission.

- iii. **Allocative Efficiency:** Since users are likely to pay for the services that they need most, private participation and risk-return management has the added benefit since the scarce resources are automatically directed towards the areas where the need is greatest.
- iv. **Fiscal Prudence:** Both at the centre and state levels, for a variety of reasons, there is a growing concern that the absolute and relative (to GDP and GSDP, respectively) levels of fiscal deficit are high and that incurring higher levels of deficit to finance infrastructure projects is not feasible.

On the strength of these arguments, the government has endeavoured to create a facilitating environment for large scale involvement of private sector in development of infrastructure. The private sector category includes PPP projects as well as pure private sector projects. While the former must be based on a Model Concession Agreement (MCA) with the government such as for toll roads, ports, and airports; the latter are market-based such as in telephony and merchant power stations.

### **III.3 Public-Private Partnership in Infrastructure Development**

In the face of budgetary and other constraints, government has recognised private sector as a means of meeting the financing requirements for infrastructure development (Box 5). The conditions for participation of private sector are, in most cases, different from those of the traditional financiers. PPPs offer significant advantages in terms of attracting private capital to create public infrastructure and enhance efficiency in the provision of services to users. The PPP course encompasses a range of alternatives such as BOT, BOOT, *etc.* (Box 3). They enable governments to transfer construction and commercial risks to the private sector, which is best equipped to manage the same. The success of such a route, however, rests on the ability of the public authorities to provide enabling arrangements to not only attract private investment but also to be able to ensure safeguarding public interest.

### Box 5: Characteristics of Infrastructure Finance

Infrastructure projects differ in significant ways from manufacturing projects and expansion and modernisation projects undertaken by companies. Essentially, infrastructure financing has following characteristics.

**Longer Maturity:** Infrastructure finance tends to have maturities between 5 years to 40 years. This reflects both the length of the construction period and the life-span of the underlying asset that is created. A hydro-electric power project, for example, may take as long as 5 years to construct but once constructed could have a much longer life-span.

**Large Investments:** While there could be several exceptions to this rule, a meaningful sized infrastructure project could cost a great deal of money. For example a kilometer of road or a mega-watt of power could cost as much as US\$ 1.0 million and consequently amounts of US\$ 200.0 to US\$ 250.0 million (Rs.9.00 billion to Rs.12.00 billion) could be required per project.

**Higher Risk:** Since large amounts are typically invested for long periods of time, it is not surprising that the underlying risks are also quite high. The risks arise from a variety of factors including demand uncertainty, environmental transformations, technological obsolescence (in some industries such as telecommunications) and very importantly, political and policy related uncertainties.

**Fixed and Low (but positive) Real Returns:** Given the importance of these investments, higher pricing here could have a cascading effect on the rest of the economy. The annual returns here are often near zero in real terms. However, once again as in the case of demand, while real returns could be near zero, they are unlikely to be negative for extended periods of time (which need not be the case for manufactured goods). Returns here need to be measured in real terms because often the revenue streams of the project are a function of the underlying rate of inflation.

The recourse to the PPP model will go a long way to bridge the infrastructure gap in India. For projects which are financially viable, PPPs are increasingly becoming the preferred mode of project implementation, especially in sectors such as highways, airports, ports, railways and urban transit systems<sup>6</sup>. So far, 65 central sector projects in road & transport, ports and civil aviation have been completed with a total investment of Rs.25,343 crore. Another 83 projects in the aforementioned categories and railways with an estimated project cost of Rs.75,914 crore are under implementation in the central sector. Further, 160 projects in these segments are in the pipeline with an estimated project cost of Rs.1,84,807 crore.

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<sup>6</sup> Compendium of PPP projects in Infrastructure, Planning Commission, March, 2010.



In the state sector (including the Union Territories) primarily in the roads, urban infrastructure and ports (in the coastal states) segment, 176 projects have been completed with the total investment of Rs.41,284 crore; 209 projects at an estimated project cost of Rs.1,65,197 crore are under implementation and 252 projects with an estimated investment of Rs.1,91,754 crore are in the pipeline.

The success of PPP arrangements has been distinctly noteworthy in recent years in the cellular segment of telecommunications sector and to some extent in the power and road sectors. This could be credited to a host of factors such as sector specific policies, government commitment, increased private interest in these sectors, evolving competitive market processes, greater availability of information, size of the projects, acceptable price and encouraging developer returns, *etc.* In this context, in terms of policy support, development of credible regulatory mechanisms and presence of effective regulatory bodies would go a long way in enhancing the public confidence.

#### **III.4 Sources of Funds**

The states governments are likely to depend mainly upon budgetary support (66.3 per cent) to fund their infrastructure projects during the Eleventh FYP, while the central government and private sector would fund 51.7 per cent and 70.0 per cent, respectively, through borrowings from the market (Table 9). The central government is likely to generate 22.2 per cent of resources through internal means, while for the state governments this would constitute only 10.1 per cent of total resources. Overall, the debt and non-debt components of the total resources likely to be raised would almost be equal.

##### **(i) Budgetary Support**

Financing of the proposed investment of Rs. 20,56,150 crore over the Eleventh FYP relies only to the extent of Rs. 6,44,671 crore (31 per cent) on budgetary support. In the case of states, about Rs. 4,44,671 crore is expected from budgetary resources. The budgetary support is limited because of large

**Table 9: Projected Investment : Source-wise**

(Rs. crore at 2006-07 prices)

	Eleventh Plan					Total XI <sup>th</sup> Plan	Share (%) of total investment
	2007-08	2008-09	2009-10	2010-11	2011-12		
1	2	3	4	5	6	7	8
<b>1 Centre</b>	112608	128305	148545	172123	204041	765622	37.2
Central Budget	29416	33517	38804	44963	53301	200000	9.7
Internal Generation(IEBR)	24958	28437	32922	38148	45222	169687	8.3
Borrowings (IEBR)	58234	66352	76819	89012	105518	395936	19.3
<b>2 States</b>	79499	99022	124998	160232	207186	670937	32.6
States Budgets	52689	65628	82844	106195	137315	444671	21.6
Internal Generation(IEBR)	8043	10018	12646	16211	20961	67880	3.3
Borrowings (IEBR)	18767	23376	29508	37826	48910	158386	7.7
<b>3 Private</b>	78166	94252	115724	146762	184687	619591	30.1
Internal Accruals/Equity	23450	28726	34717	44029	55406	185877	9.0
Borrowings	54716	65976	81006	102733	129281	433713	21.1
<b>4 Total Projected Investment</b>	<b>270273</b>	<b>321579</b>	<b>389266</b>	<b>479117</b>	<b>595913</b>	<b>2056150</b>	
Non-Debt	138555	165875	201933	249546	312205	1068114	51.9
Debt	131718	155704	188333	229571	283709	988035	48.1

**Note :** IEBR refers to Internal and Extra Budgetary Resources.**Source:** Eleventh Five Year Plan Document, Planning Commission.

financing requirements of other sectors such as agriculture, health and education. Of the available resources for infrastructure, large sums are likely to be directed towards rural infrastructure and development in the North-East (Box 6).

### (ii) Internal Generation

The internal resources which would constitute 20.6 per cent of the total investment during the Eleventh Plan comprise internal accruals and equity of the private sector. In the public sector, it is essential to bring in efficiency improvements for economising on costs and enforce rational user charges for improving the revenue streams. Inadequate attention to these aspects would seriously restrict the ability of public sector to raise resources for such investments, thereby adversely affecting infrastructure investment with its consequential negative impact on GDP growth.

### Box 6: Investment in Rural Infrastructure

Improvement in rural infrastructure is one of the key indicators for the development of the economy and the Government has launched a special programme, Bharat Nirman, for upgradation of rural infrastructure, which aims to provide electricity to the remaining 1,25,000 villages and to 23 million households, to connect the remaining 66,802 habitations with all weather roads, and construct 1,46,185 km of new rural

**Projected Investment in Rural Infrastructure**  
(Rs. crore at 2006-07 prices)

Sector	Projected Investment
Electricity	34,000
Rural Roads	41,347
Telecommunications	16,000
Irrigation (incl. Watershed)	2,53,301
Water Supply and Sanitation	90,701
<b>Total</b>	<b>4,35,349</b>

roads network, to provide drinking water to 55,067 uncovered habitations, and to provide irrigation to an additional 10 million hectares, besides connecting the remaining 66,822 villages with telephones. It is estimated that out of the total projected investment of Rs. 14,25,210 crore to be incurred by the Centre and the States in the Eleventh Plan, Rs. 4,05,360 crore would be spent exclusively towards improvement of rural infrastructure in accordance with the distribution across sector.

Source: Planning Commission.

### (iii) Viability gap funding for Infrastructure

Infrastructure projects have a long gestation period and, in most cases, have valuable social but unacceptable commercial rate of return. In order to overcome the resource constraints and promote techno-managerial efficiencies, the government is encouraging PPPs in infrastructure development through a special facility *i.e.* 'viability gap funding'. This facility, announced in 2004 and operationalised in 2005, is meant to reduce the capital cost of the projects by credit enhancement, and to make them viable and attractive for private investors through supplementary grants. Budgetary provisions for this facility are made on a year to year basis. Department of Economic Affairs in the Ministry of Finance examines the project 'eligibility for consideration'. The lead financial institution monitors and evaluates project compliance.

Viability gap funding can take various forms, including but not limited to capital grant (one time or deferred), subordinated loans, operations and management support grants or interest subsidy. A mix of capital and revenue support may also be considered. The funding is disbursed contingent on agreed

milestones, preferably physical, and performance levels being achieved, as detailed in funding agreements. The funding is provided in installments, preferably in the form of annuities, and with at least 15 per cent of the funding disbursed only after the project is fully functional.

#### (iv) Debt/Borrowings

The debt component of the total investment during the Eleventh Plan period would be around Rs. 9,88,035 crore (48.1 per cent). The private sector would need to fund almost 70.0 per cent of their resource requirements through borrowings, while for central government and state government; such requirements would be 52.0 per cent and 23.6 per cent, respectively. The main sources for raising the debt would be commercial banks, non-banking financial companies, pension/insurance companies and external commercial borrowings (Table 10).

As may be seen, with all sources of debt taken together, the total availability of funds for financing infrastructure in the Eleventh Plan is estimated at

<b>Table 10: Likely Sources of Debt</b>						
(Rs. crore at 2006-07 prices)						
Item	Eleventh Plan					Total XI <sup>th</sup> Plan
	2007-08	2008-09	2009-10	2010-11	2011-12	
1 Domestic Bank Credit	49,848	63,207	80,1471	101,626	128,862	423,691
2 Non-Bank Finance Companies	23,852	31,485	41,560	54,859	72,415	224,171
3 Pension/Insurance Companies	9,077	9,984	10,983	12,081	13,289	55,414
4 External Commercial Borrowings	19,593	21,768	24,184	26,868	29,851	122,263
<b>5 Likely Total Debt Resources</b>	<b>102,370</b>	<b>126,444</b>	<b>156,874</b>	<b>195,435</b>	<b>244,416</b>	<b>825,539</b>
<b>6 Estimated Requirement of Debt</b>	<b>131,718</b>	<b>155,704</b>	<b>187,333</b>	<b>229,571</b>	<b>283,709</b>	<b>988,035</b>
US \$ Billion	32.93	38.93	46.83	57.39	70.93	247.01
<b>7 Gap between Estimated Requirement and Likely Debt Resources (6 - 5)</b>	<b>29,348</b>	<b>29,260</b>	<b>30,460</b>	<b>34,136</b>	<b>39,292</b>	<b>162,496</b>
US \$ Billion	7.34	7.31	7.61	8.53	9.82	40.62

**Source:** Eleventh Five Year Plan Document, Planning Commission.

Rs.8,25,539 crore. The funding gap for the debt component is accordingly, Rs.1,62,496 crore (or US\$ 40.6 billion). To bridge this gap, it may be necessary to enhance availability of bank credit; relaxation in norms for raising external commercial borrowings; and tap pension, insurance and other funds to finance infrastructure projects.

**(v) Specialised Institutions**

Providing long-term finance to infrastructure projects from the banking sector has become a challenge with the extinction of Development Finance Institutions (DFIs). The extant banks find it difficult to bridge the gap created due to asset liability mismatches on account of such financing. In recent years, initiatives have been taken by the government to provide for long-term infrastructure finance through creation of Infrastructure Development Finance Corporation (IDFC) and India Infrastructure Finance Company Limited (IIFCL). The IIFCL was incorporated on January 5, 2006 with an authorised capital of Rs.2,000 crore and paid-up capital of Rs.1000 crore. The IIFCL would lend funds, especially debt of longer-term maturity, both directly to the eligible projects and by extending refinance to banks and financial institutions to supplement their resources for infrastructure financing. The IDFC is an infrastructure arm to provide long-term finance for this sector. The IDFC in partnership with Feedback Ventures has created India Infrastructure Initiative (Box 7) that would identify infrastructure development projects across the country and promote PPP for building infrastructure. Though the IDFC and the IIFCL provide long-term and viability gap funding for the infrastructure development, they are not deemed sufficient to meet the growing financing needs of the sector.

**(vi) Other Sources**

The data on bank credit to infrastructure substantiate that commercial banks have proactively freed resources to meet the credit needs of infrastructure sector. The deployment of gross bank credit to infrastructure

### Box 7: India Infrastructure Initiative

The India infrastructure initiative (III) is jointly promoted by IDFC and Feedback Ventures. The IDFC, established by the Government of India in 1997 specialises in providing capital to commercially viable infrastructure projects, promotes public-private partnerships, and provides policy advice to encourage private financing in infrastructure. Feedback ventures is India's leading infrastructure development company with a 16-year-old track record of putting together infrastructure projects in core, social, and urban infrastructure. Feedback works with the leading Indian states to manage the process of creating PPP projects. The III starts with the corpus jointly contributed by IDFC and Feedback Ventures.

With the private capital and entrepreneurship waiting, there is a genuine concern about the absence of a sufficiently large number of tangible projects that will act as the vehicles to absorb private funding in infrastructure. While the government recognises the gap in infrastructure development and could play a key role as project sponsors, it is sometimes limited by inadequate availability of finances and experienced resources in development and implementation of projects. Therefore the government and its agencies often require appropriate guidance and implementation assistance to:

- design projects for PPP;
- appreciate technical and engineering challenges;
- master complicated capital-structuring issues;
- meet the challenges of India's political economy, especially those relating to user charges, entrenched operators, and independent regulators, wherever they exist;
- attract enough bidders;
- transparently evaluate bids; and
- supervise the implementation and maintenance of projects created under PPP formats. Sometimes, government sponsor entities may not have the resources or budgetary and institutional clearances to pay for pre-operative expenses. Private investors are unwilling to spend the money upfront for all the work needed before the project takes off. In an era of transparent competitive bidding, they are not sure whether they will ultimately have the right to implement the project.

III seeks to provide critical project structuring solutions that address all these intricate issues and be a neutral facilitator. III looks to work with the central, the state, the municipal governments and panchayati raj institutions and their related entities like urban development authorities, road development corporations, water boards, etc. wherever there is scope for rational PPP initiatives. The III enables the concerned authorities and players in conceptualising, detailing, i.e. assessing the technical and engineering viability, costing revenue and profitability, etc; feasibility, do-ability, i.e., checking for clearances, regulatory issues, concessions etc.; acceptability and implementability of the projects.

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**Source:** India Infrastructure Initiative website.

has steadily gone up from 13 per cent in the year 2000 to over 33 per cent in 2009 (Table 11).

**Table 11: Deployment of Gross Bank Credit to Infrastructure**

(Rs. Crore)									
Outstanding as on Last Reporting Friday of March	Industry (Small, Medium and Large)	Petroleum	Power	Tele - communications	Roads and Ports	Coal & Mining	Electricity	Total Infrastructure	Share of Infrastructure in Industrial credit (%)
2000	200133	8969	3289	1992	1962	2366	7438	26016	13.0
2001	218839	11572	5246	3644	2459	2337	8590	33848	15.5
2002	229523	11320	7373	3972	3464	3002	9343	38474	16.8
2003	295562	14743	15042	5779	5476	3103	11173	55316	18.7
2004	313065	12266	19655	8408	9161	2800	14090	66380	21.2
2005	423136	15261	38235	15705	14500	2139	10559	96399	22.8
2006	550444	25150	60157	18455	19695	4146	14546	142149	25.8
2007	697339	35886	73158	19446	24984	7704	25787	186965	26.8
2008	866875	41601	95067	38043	34530	12262	37480	258983	29.9
2009	1054390	68147	124447	50326	47060	14241	48139	352360	33.4

**Notes :** Data include the impact of mergers since May 3, 2002.

**Source:** Compiled from Hand Book of Statistics on Indian Economy, RBI

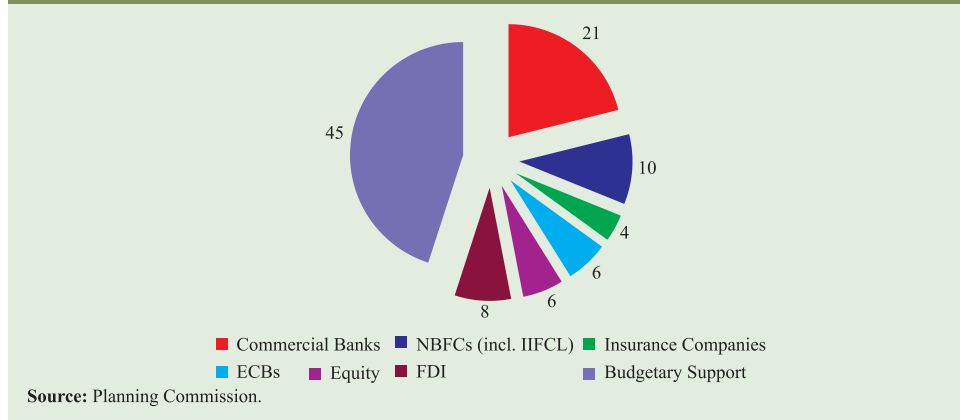
Major issues in debt finance relate to asset-liability mismatch of banks and this constrains the ability of banks to extend finance to long-gestation infra projects. Development of efficient and liquid corporate bond market, in this context, can provide a viable alternative in meeting the financing requirements of infrastructure.

The other than budgetary support resources are estimated to be at 55 per cent during the first three years of the Eleventh FYP. The total debt would account for approximately 41 per cent of the resources and equity (including FDI) is estimated to contribute 14 per cent of the funds (Figure 3).

### Regulatory Issues in Borrowing from Banks and Financial Institutions

Financing of infrastructure by banks and financial institutions poses three different kinds of regulatory issues. First, many infrastructure projects require long-term financing. When banks provide such funding, they are exposed to a maturity mismatch, as most of their funding is through short-term deposits. The maturity mismatch poses in part liquidity risk and partly an interest rate

Figure 3 : Financing the 11th FYP (first three years)



risk. Lending on a floating rate basis can mitigate the interest rate risk for the bank but at the cost of putting the project promoter at a disadvantage. Capital-intensive infrastructure projects are not well positioned to handle this risk. Further, banks and the financial institutions have limited appraisal skills necessary for credit appraisal of such projects. The issue is that the banks cannot be the sole or even the dominant providers of funds for these projects. However, a project that is able to tap a diverse range of funding options could benefit greatly from timely bank finance. For this to happen, it is necessary to strengthen and reform the banking system (Ferreira and Khatami 1996).

The world over, long-term liabilities have been used to finance long-term assets, underlining the relative importance of insurance companies in infrastructure development *vis-à-vis* banks. The Indian insurance companies, however, have not played a significant role in financing infrastructure projects, particularly those sponsored by private companies.

### Refinancing through ECBs

The existing guidelines do not permit domestic financial intermediaries to refinance existing rupee loans from external sources, although a potential



market for the same exists. The refinancing of existing rupee loans through ECB, if permitted for infrastructure, could offer the following benefits:

- Some foreign financiers, who are not keen to participate in projects in early risky stage, may show interest in the post-construction period when the risks subside.
- Indian lenders to infrastructure projects would like to have some of their loans refinanced in order to enhance their assets portfolio, and at times, to limit their risks.
- Local promoters will benefit from greater diversity of funding sources as well as better price discovery. Refinancing from external sources would be particularly attractive in the situations when domestic interest rates are relatively high and the rupee is tending to appreciate.

The current ceiling of LIBOR+350 basis points for ECBs makes it difficult for the issuers to raise senior debt, subordinated debt, mezzanine financing or *quasi* equity as the maximum permissible return is not considered enough to match the perceived risk. Keeping in view the long-term nature of infrastructure projects and the need for risk capital (in the form of *quasi* equity), this all-in-price ceiling on ECBs, if removed for senior, subordinated and mezzanine foreign debt for infrastructure projects, will ensure inflow of liquidity for longer tenors, and in many cases, protect promoters of infra projects from illiquidity in domestic loan markets arising due to seasonal factors.

### **Foreign Direct Investment (FDI)**

The FDI policy has been liberalised since the initiation of economic reforms in India. FDI is permitted up to 100 per cent in greenfield projects under the automatic route. In the case of existing projects, however, FDI under automatic route is permitted upto 74 per cent and beyond 74 per cent the FIPB approval is required. Further, 100 per cent FDI is allowed under automatic route for coal and lignite mining, construction development projects, mining of diamonds, precious stones, gold, silver and minerals, petroleum and natural

gas sector, power generation, transmission, distribution, power trading and manufacture of telecom equipments. Telecommunication services attract 74 per cent FDI ceiling subject to certain conditions. In the case of air transport services, upto 49 per cent FDI is allowed. Due to gradual liberalisation of FDI norms, the actual inflows into the infrastructure sector constitute a major share in the total inflows into the country.

### **III.5 Role of International and Multilateral Institutions:**

Globally, infrastructure financing is the forte of a wide range of international institutions, which include export credit agencies, international commercial banks, international bond markets, multilateral institutions and bilateral agencies. The international commercial banks are the largest source of private finance for infrastructure development in developing countries. The export credit agencies provide direct finance and guarantee commercial bank credit.

#### *International bond markets*

Bond financing is in many ways the ideal source of finance for infrastructure. Costs are higher than for syndicated loans, but maturities of ten to thirty years are typical, and even longer maturities are available for creditworthy borrowers. Globally, the modest scale of bond financing of infrastructure is on account of limited access to international bond markets. The pricing of private corporate securities issued in the international bond markets depends partly on corporate financial characteristics and partly on the country characteristics. The efficiency of bond pricing can be enhanced by issuing and actively trading the sovereign debt in the market. This increases country visibility, and the appetite for corporate securities. It further provides a benchmark against which corporate debt can be efficiently priced. Issuing sovereign debt, however, implies that countries must be willing to accept continuous scrutiny of macroeconomic performance and economic policies by international credit rating agencies.

### *Multilateral Institutions*

The presence of a multilateral institution in the investment profile of an infrastructure project provides an additional attraction to long-term investors and extends comfort to the private investors. One, such institutions play the role of a catalyst in financing infrastructure projects by facilitating convergence of resources into private sector projects which deliver development impact. Two, they add value to private sector projects for sustaining the development process in the economy. The following paragraphs reflect on individual multilaterals pursuing these objectives in India.

#### *The World Bank*

The World Bank aligns its country strategies to the country's specific development priorities. The Country Strategy for India (2009-2012) is mapped out in sync with the Eleventh FYP. One of the focus areas of the strategy is to assist India to fast-track the development of infrastructure.

India is one of the founder members of the World Bank. The World Bank and IFC are collaborating to enable India to deal with the challenges of successful execution of the PPPs, especially in power transmission, roads, irrigation, rural infrastructure and urban development. This will now be extended to agri business, health & education, and renewable energy. The Bank and IFC are also working on long term finance; through the proposed IIFCL project. The country strategy for India envisages total proposed lending of US\$ 14 bn for 2009-2012. As private sector financing dries up post the financial crisis, the Bank will provide US \$ 3 bn additionally as part of total financing envelop of US \$ 14 bn. Infrastructure focus is a crucial component of the country strategy for India.

India was the largest IDA and second largest IBRD borrower from the Bank in the fiscal 2008. The Bank's US \$ 15.1 billion portfolio in the country covers 61 active investment projects. During the FY 2008, the Bank's board

approved US \$ 2.7 billion for new projects for India covering a range of sectors including infrastructure, education, health & rural development.

The World Bank has traditionally funded public sector infrastructure projects. In South Asia, the World Bank has played a major role in funding infrastructure development and approved nearly US\$5.65 billion for South Asia by 2010.

#### *The International Finance Corporation (IFC)*

The private sector arm of the World Bank Group, the IFC plays an important role in financing private sector infrastructure, but its scale of operation is relatively modest. The IFC is the world's largest multilateral source of equity and loan financing for private enterprises in developing economies. IFC has made infrastructure financing a priority since it impacts the living standards and plays a significant role in development of all other sectors. An important feature of IFC syndication in financing private sector infrastructure is that it has brought in non-bank financial institutions, including international insurance companies, to finance infrastructure projects in developing countries.

Since 1956, the IFC has invested in 151 projects in India, providing nearly \$2.5 billion as loans and \$875 million as equity participation. IFC's portfolio of \$3.4 billion for the financial year 2009 to India makes India its largest country of operations with 9.8 per cent share, followed by Brazil and Russian Federation. IFC has supported the establishment of first PPP in India's power transmission sector through Powerlinks, a joint venture between Tata Power Company and Power Grid Corporation of India. IFC is also an existing shareholder in IDFC with an equity stake of around 6 per cent.

#### *Asian Development Bank*

India is the founder member of the Asian Development Bank (ADB) and is its fourth largest shareholder. The ADB offers direct assistance to the private sector in an array of segments. It assists private enterprises to undertake

financially viable projects with significant economic and social merit and thereby achieve positive development impact. ADB's total financial support for a project, including loan, equity investment, partial credit guarantee, and underwriting commitment is limited at 25 per cent of the total project cost or US\$50 million, whichever is lower. ADB also provides political risk guarantee coverage without the host government's counter-guarantee of up to 50 per cent of the total project cost or US\$100 million, whichever is less. Further the ADB also guarantees loans.

Infrastructure financing has been the traditional forte of the ADB. Since inception, the ADB has approved 144 loans for India amounting to \$22,228 million. As at the end of 2009, the ADB's portfolio included 53 ongoing loans for \$8.4 billion, with \$2.8 billion to transport, \$1.5 billion to urban infrastructure, \$2 billion to the energy sector, and \$1.5 billion to the financial sector. Three MFF tranches for \$1.1 billion have been approved in 2009.

ADB has drawn a programme - India assistance strategy - over the period 2008–2010. The program includes provision of loans to help improve water resource management in Orissa (\$200 million, 2008); North Eastern States Integrated Flood Control and River Erosion Mitigation project (\$200 million, 2009); and Sustainable Coastal Zone Protection and Management project (\$200 million, 2010).

#### **Section IV: Reserve Bank of India's Role in Development of Infrastructure**

The RBI on its part has accorded top priority to infrastructure financing by banks even though there are issues related to asset-liability mis-match. Owing to the very nature of infrastructure projects, which are of longer-term, banks find themselves constrained since they have short-term liabilities in the form of deposits. In this regard, Subbarao (2009) contends,

*“This huge and growing demand of infrastructure finance will have to be met even as banks wrestle with expanding their traditional banking devices. Apart from findings the resources, banks will also need to ... their skills in appraisal and management of risks interest in the infrastructure financing”.*

In 2003, the RBI provided a definition of ‘infrastructure lending’ by banks, FIs or NBFCs so as to clearly lay down the sectors, which were eligible for bank financing under the ‘infrastructure lending’. In terms of this, a credit facility provided to a borrower company engaged in either developing; or operating and maintaining; or developing, operating, and maintaining any infrastructure facility that is a project in any of the following sectors (i) a road, including toll road, a bridge or a rail system; (ii) a highway project including other activities being an integral part of the highway project; (iii) a port, airport, inland waterway or inland port; (iv) a water supply project, irrigation project, water treatment system, sanitation and sewerage system or solid waste management system; (v) telecommunication services whether basic or cellular, including radio paging, domestic satellite service (*i.e.*, a satellite owned and operated by an Indian company for providing telecommunication service); network of trunking, broadband network and internet services; (vi) an industrial park or a special economic zone; (vii) generation or generation and distribution of power; (viii) transmission or distribution of power by laying a network of new transmission or distribution lines; and (ix) any other infrastructure facility of similar nature.

The scope of the definition was extended in the Annual Policy Statement for 2004-05 to also include construction relating to projects involving agro-processing and supply of inputs to agriculture; construction for preservation and storage of processed agro-products, perishable goods such as fruits, vegetables and flowers including testing facilities for quality; and construction of educational institutions and hospitals. In addition, the periphery of the definition has further been enlarged to include credit facilities sanctioned by the banks and the select AIFIs for projects involving laying down and / or maintenance of gas / crude oil / petroleum pipelines, in view of the importance of pipelines in the industrial development of the country.

Nevertheless, while infrastructure is recognised as a crucial input for economic development, the usage of the term ‘infrastructure’ in India varies across different agencies as different agencies have laid down different definitions of infrastructure (Table 12).

**Table 12: Comparative Table on definition of Infrastructure sector in India**

Sector	Ranga- rajan Committee (2001)	Rakesh Mohan Report/ CSO (1996)	RBI (2003)	Income Tax	IRDA (2008)	Ministry of Finance Economic Survey	World Bank	Decision of the Empowered Sub-Committee of Col (2008)
Electricity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (incl. R&M of power station)
Water Supply	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sewerage	Yes		Yes	Yes	Yes	Yes	Yes	Yes (incl. SWM and street lighting)
Telecommunications	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Roads & Bridges	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ports	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (incl. Inland waterway)
Airports	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rail (rolling Stock)	Yes	Yes				Yes	Yes	Yes
Railways	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes (incl. MTS)
Wind Energy		Yes (CSO)						Yes (incl. Solar Energy)
Irrigation Development	Yes	Yes	Yes	Yes	Yes			Yes (incl. watershed)
Storage		Yes	Yes	Yes (at ports)	Yes			Yes
Housing		Yes	Yes		Yes (SWM)			Yes
Urban services; as Street lighting, Solid Waste Management (SWM)		(Rakesh Mohan) - No (CSO)						
Oil production & pipe lines	Yes						Yes	Yes (oil pipelines only)
Mining							Yes	
Gas distribution		Yes					Yes	Yes (gas pipelines only)
Aircrafts	Yes	Yes						
Vehicles, trucks, buses etc. (Road Transport System)	Yes	Yes						
Industrial Part/SEZ		Yes (RM), No (CSO)	Yes	Yes	Yes			
Educational Institutions			Yes		Yes			
Hospitals			Yes		Yes			
Posts						Yes		

Source : Planning Commission, Secretariat for Infrastructure.

In order to provide conducive environment for infrastructure funding and sustaining the growth momentum, the Reserve Bank has put in place mechanisms to steer the fund flow from banking sector towards infrastructure and accordingly issued specific guidelines from time to time. The first major initiative in this direction was taken when as supplement to the Reserve Bank's policy in post-April 1997 period, banks were given operational freedom in the matter of credit dispensation. Further, in view of the criticality of infrastructure development in India, provisions for participation of the private sector have been introduced. RBI has extended a number of regulatory concessions to banks to prop up their infrastructure financing. First, it has allowed banks to enter into take out financing arrangements. Second, it has relaxed the single and group borrower limit for additional credit exposure in the infrastructure sector. Third, it has permitted banks to extend finance for funding promoter's equity where the proposal involves acquisition of share in an existing company engaged in implementing or operating an infrastructure project in India. Fourth, banks have been given freedom to issue long-term bonds for financing infrastructure. Fifth, banks have been given flexibility to invest in unrated bonds of companies engaged in infrastructure activities within some ceiling rate. Sixth, it has also allowed exclusion of the promoters' shares in the SPV of an infrastructure project to be pledged to the lending bank from the banks' capital market exposure. Seventh, interest rate futures have been reintroduced in Indian financial markets, which would enable the banks to manage their interest risk more efficiently, especially in the wake of asset-liability mismatch created in the case of financing infrastructure projects. Eighth, it has been decided to allow repos in the corporate bonds in the second quarter review of Monetary Policy of 2009-10, which is an endeavour towards deepening of the corporate market. Ninth, the Reserve Bank has introduced plain vanilla OTC (over-the-counter) single -name credit default swaps for resident entities. Tenth, infrastructure NBFCs are being introduced as separate entities especially for financing infrastructure projects. Eleventh, banks are being permitted to build up capital for 'take-out' exposures in a phased manner. Twelfth, refinancing



through the SPV (IIFCL) has been allowed to leverage bank financing for the PPP projects.

Further, the Annual Policy Statement of the RBI in April 2010 announced a number of measures, which seek to facilitate adequate flow of bank credit to infrastructure sector. First, in respect of road/highway projects, which are being built-operate-transfer (BOT) model, it has allowed the treatment of annuities and toll collection rights as tangible securities subject to the condition that banks' possess legal right to receive annuities and toll collection. Second, for banks, which have in place an appropriate mechanism to escrow the cash flows and also have a clear and legal first claim on such cash flows, the minimum provisioning requirement for unsecured sub-standard infrastructure loans has been reduced to 15 per cent from 20 per cent. Third, with a view to incentivising banks to invest in long-term bonds issued by companies engaged in infrastructure activities, banks have been allowed to classify their investments in non-SLR bonds issued by such companies and having a minimum residual maturity of seven years under the held to maturity (HTM) category. This is a major departure as earlier such investments of the banks used to get classified either under held for trading (HFT) or available for sale (AFS) category and were subjected to 'mark to market' (MTM) requirements.

Further, to stimulate public investment in infrastructure, a special purpose vehicle - India Infrastructure Finance Company Limited (IIFCL) was set up in 2006 for providing long-term financial assistance to infrastructure projects. IIFCL was allowed to use a small part of India's foreign exchange reserves for infrastructure development (Box 8). Nearly a year after its incorporation, the UK subsidiary of IIFCL received the first imbursement of \$250 million from the Reserve Bank of India from its foreign exchange reserves. This is the first time that the RBI has subscribed to the bond issue of an infrastructure lending company. The borrowing will enable IIFCL (UK arm) to give infrastructure loans to Indian companies at competitive costs compared to

### Box 8: Foreign Exchange Reserves for Infrastructure Development in India

In the last decade or so, some of the Asian countries (China, Korea, Singapore, *etc.*), on account of their large current account surpluses and huge capital inflows, had managed to accumulate huge foreign exchange reserves (FER). In some of these countries, the amount of reserves accumulation was far in excess than what was needed for 'liquidity' purposes and for providing 'cushion' against external shocks. This led these countries to deploy a part of their foreign exchange reserves to 'aggressively managed portfolios' maintained by the Sovereign Wealth Funds (SWFs).

In India, the accelerated growth of foreign exchange reserves during the decade of 2000, coupled with escalating infrastructure constraints and the related financing deficit led to a debate on possibility of using foreign exchange reserves for investment in infrastructure sector. Such a practice had, however, not been seen in any other country in the world. It was argued that these reserves, while providing a buffer against adverse external developments, do not contribute directly to the real sector, as they are invested in foreign currency assets such as government bonds of developed countries, which yield low returns. In fact, it is well known that the cost of sterilization that the reserve accumulation entails exceeds the returns on these investments. The opponents of the idea of use of the reserves for infrastructure development raised serious concerns which are validated on account of the following reasons. First, it would be very difficult to reckon in the Indian context – as is the case with many other countries – the 'reserve adequacy' in a dynamic setting and on that basis divert a part of 'excess' reserves for higher return riskier assets. Second, India's reserves are the result of the Reserve Bank of India's foreign exchange market interventions and, as such, are not sovereign wealth, and hence are not fiscal resources. Third, underlying much of India's reserves build-up are potentially volatile short-term portfolio capital inflows, which call for setting aside more reserves. Fourth, infrastructure projects in India yield low or negative returns due to political and economic risks associated with adjusting the tariff structure pricing the infrastructure services not on a cost plus basis, delay in introducing labour reforms and up-gradation of technology. A more direct and effective policy approach to financing infrastructure is to create a more favorable business environment for private sector investment. Fifth, using reserves to finance infrastructure will soften the government's budget constraints and weaken fiscal discipline, a major risk in the light of government's overall unhealthy fiscal position. Sixth, much of the infrastructure investments are likely to revolve around domestic spending, so it makes more sense for the government to issue rupee denominated infrastructure bonds directly.

In India, initiatives in respect of using FER for infrastructure financing are to be seen in the context of balancing the objectives of the RBI for reserve management (safety, liquidity and return) against the needs of the infrastructure sector. The Report of the Committee on Infrastructure Financing (May 2007) had suggested for creating an externally focused investment arm and mono-line credit insurance company backed by foreign exchange reserves as an operating structure for channeling foreign exchange funds to infrastructure sector while at the same time addressing the concerns of domestic monetary expansion and proposing only a small fraction of total reserves to be used for the purpose in view of the real risks of disruptive reversals of capital flows. A beginning was made in this direction when the Finance Minister announced in the budget speech 2007-2008 to "use a small part of the foreign exchange reserves without the risk of monetary expansion" for the purpose of financing infrastructure projects. Accordingly a scheme has been finalized which envisaged RBI investing, in tranches, up to an aggregate amount of USD 5 billion in fully government guaranteed foreign currency denominated bonds issued by an overseas SPV of the India Infrastructure Finance Company Ltd. (IIFCL), a wholly owned company of Government of India. The funds, thus raised, are to be utilized by the company for on-lending to the Indian

*(Contd.)*

#### **Box 8: Foreign Exchange Reserves for Infrastructure Development in India (Concl.)**

companies implementing infrastructure projects in India and/or to co-finance the ECBs of such projects for capital expenditure outside India without creating any monetary impact. The lending by the SPV under the arrangement would be treated as ECBs and would be subject to the prescribed reporting and disclosure requirements. The bonds will carry a floating rate of interest. The investment by the RBI in the foreign currency denominated bonds issued by the SPV will not be reckoned as a part of the foreign exchange reserves, but will be a foreign currency asset on the RBI balance sheet.

After due approval of the Government of India, IIFC (UK) Ltd. was incorporated in London and was set up in April 2008. It is noteworthy that this arrangement is distinct in the sense that India is both a home and a host for the IIFCL's subsidiary, as it is basically the SPV for channelizing foreign exchange funds for meeting the requirements of the Indian private sector for infrastructure projects in India by drawing upon the foreign exchange reserves of the country available with the Reserve Bank. The scheme has been ring-fenced such that IIFC (UK) directly pays the overseas seller, and the Indian importer gets the equipment, in such a way that the forex reserves never enter the country. In addition, IIFC (UK) works with a consortium of bankers for various infrastructure proposals, and limits its exposure in any one project.

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international debt market rates. The Union Budget for 2009-10 announced that IIFCL in consultation with banks will evolve 'take out financing' scheme to facilitate lending to the infrastructure sector. To ease the financing constraints for infrastructure projects under the PPP mode, the government has decided that IIFCL would refinance 60 per cent of commercial bank loans for PPP projects in critical areas over the next fifteen to eighteen months. The IIFCL was authorised to raise Rs.10,000 crore through government guaranteed tax free bonds by the end of 2008-09 and an additional Rs.30,000 crore on the same basis as per the requirement in 2009-10. As per budget 2010-11, it has been asked to more than double its disbursements in 2010-11. IIFCL will also double the amount of refinance it provides to Indian banks from Rs 3,000 crore in 2010-11, while last year's take-out financing scheme will provide around Rs 25,000 crore in the next three years. According to IIFCL's website, as on March 25, 2010, it had outstanding sanctioned loans to the tune of Rs.21,302 crore to finance 98 infrastructure projects

across the country. So far, bulk of IIFCL's loans have been extended to power and roads – power and road projects accounted for 45.2 per cent (Rs 9629 crore) and 40.8 per cent (Rs 8689 crore), respectively.

## **V. Concluding Observations**

In view of the discussions above, the paper has the following conclusions to offer:

- Development of basic infrastructure is a critical necessity to meet the growth requirements of a country. Infrastructure financing needs cannot be met by the government alone, and hence the case for private sector participation is strong for meeting the challenge.
- Even though the Indian financial system is adequately equipped to meet this challenge, the risk aversion of Indian investors, relatively small capitalisation (compared to the large quantum and long duration funding needs of infrastructure finance) of various financial intermediaries requires adoption of innovative financial structures and revisiting some of the regulations governing infrastructure financing in India. An implication of the strategy outlined in this paper is that infrastructure services would have to be provided on commercial principles, essentially pointing to the necessity of serious consideration of the issue of user charges, which lend viability to such projects. Various studies and reports have time and again emphasised this.
- The long-term financing of infrastructure projects may lead to asset-liability mismatches, particularly when such financing is not in conformity with the maturity profile of bank's liabilities. While extending finance for infrastructure, due vigil has to be kept in order to avoid asset-liability mismatches on account of such funding. Banks must put in place an effective ALM system within the stipulated timeframe in line with the directives of the Reserve Bank of India.

- Timely and adequate availability of credit is a prerequisite for successful implementation of infrastructure projects. The banks/FIs need to delineate clear procedure for approval of loan proposals and institute suitable monitoring mechanisms for review of applications pending beyond a specified period and follow up the project implementation in order to ensure appropriate utilisation of disbursed credit. In this connection, multiplicity of appraisals by various institutions involved in financing has to be avoided.
- While there are many issues surrounding the availability of suitable intermediaries with an adequate amount of risk capital for infrastructure financing, there does not appear to be shortage of funds *per se* within the economy. Indians have shown a great deal of willingness to save and hold those savings in very long-term assets either as deep-discount bonds, savings linked insurance policies, post-office savings and pension funds. Indian investors appear to be highly risk averse and are prepared to accept lower returns in lieu of safety of the invested funds rather than supplying risk capital that will earn short run and higher returns. This augurs well for infrastructure funding and there is a need to innovate ways to facilitate channelising such resources into infra projects.
- In this context, therefore, there is an urgent need to address the issue of innovations in order that the intermediaries, instruments and markets can perform the functions of risk, maturity and duration transformation to suit the needs of the investors. While FDI has the potential to provide some of the equity capital, it appears very likely, as traditionally is the practice, that the government itself would have to emerge as the provider of the bulk of this risk capital with banks and capital markets offering the debt finance. In the past the government has assumed the role of provider of risk capital and debt funds through development banks but for a variety of reasons, this approach has not met with much success. It is, therefore, imperative to examine the evidence at hand and attempt to discover new

ways of addressing the problems that appear to be retarding the pace at which infrastructure investment is progressing.

- The PPP model of infrastructure building has gained momentum in recent years the world over. The implementation strategies of the model are, however, at a nascent stage in the EMEs including India. The private sector participation in investment in the infrastructure building in India has been envisaged at 30 per cent during the Eleventh Plan period. However, going by the experience gained during the Tenth Plan, this objective appears to be rather elusive. Although there is a robust growth in the PPP investments in the road sector, the forthcoming investments in other sectors such as power, irrigation and ports are relatively meager. The flow of private investments into the infrastructure sector depend on a host of factors such as investors' interest in these sectors, bureaucratic efficiency, evolving market processes, greater availability of information, size of the projects and developers' returns. The issues outlined need urgent policy consideration and committed response so that the desired results can be achieved.
- Finally, it is necessary to even out land issues and push for land reforms if infrastructure in India has to match the world standards in coming years (Raghuram Rajan, 2010).

To sum up, The PPP mode of infrastructure financing comes out as the most viable and desirable model, while keeping in view the commercial considerations and application of appropriate user charges. The model is likely to be a success provided a transparent risk and revenue sharing approach is followed. The Reserve Bank on its part has liberalised the lending norms significantly so as to facilitate building the world-class infrastructure in India.

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