Risk management in Financing Infrastructure Projects

Chapter 1

Financing Infrastructure Projects – Basics

1.0. Introduction

Inadequate infrastructure is considered to be the biggest stumbling block in any country's growth. The economic plans and strategies would reach a dead end on this point alone. The general disillusionment with the public sector's performance, its inefficient and insensitive approach to consumer needs and government's poor fiscal position has triggered the breaking up of the government monopoly over infrastructure. As governments shift their position from being infrastructure providers to facilitators, private entrepreneurs, banks and financial institutions (FIs) assume a more direct role. Concerted actions for bringing in more private participation in economic infrastructure have already been initiated by governments and other authorities. The whole gamut of issues centre on the strategy to commercialise infrastructure. While, there are several dimensions to the issue of private participation in infrastructure projects, the financing of such projects requires special attention.

1.1. Role of Infrastructure and its links with Economic Growth

Infrastructure facilities are often referred to as the ‘wheels of growth’. More often it can also turn out to be the ‘engine of growth’. The adequacy of infrastructure can determine one country’s success and another’s failure. Poor infrastructure is in fact proving to be a major bottleneck to achieving high and sustainable rates of growth in most developing countries. That infrastructure is inexplicably intertwined with economic growth, is amply manifest from an input-output matrix of an economy, which would show telecommunications, electricity and water being used in the production process of nearly every sector, and transport as an input in every commodity. Empirical studies that seek to quantify the link between infrastructure and economic growth abound. Some evidence is quoted here:
• Studies linking aggregate infrastructure spending to the growth of GDP show very high returns in both time series and cross-national analysis with implied rates of returns computed at 60% for the USA, 77% for Taiwan and China, 63% for a cross-section of developing countries.\(^1\)

• Studies estimating the impact of infrastructure on production costs in some OECD countries find that infrastructure significantly reduces production costs in the manufacturing sector.\(^2\)

• In the context of rural infrastructure, time series analysis for eighty-five districts and thirteen Indian states reveal that lower transport costs increased farmers' access to markets and led to considerable agricultural expansion. Modern irrigation methods brought higher yields. Improved communications through roads lowered banks' cost of doing business, expanded lending to farmers for fertilizers further increasing yields.\(^3\)

### 1.2 Distinctive Features of the Infrastructure sector

Broadly, infrastructure projects have the following features:

• **On the financing side**—large capital costs relative to maintenance and operating costs. Sunk costs are substantial; a large proportion of the cost has to be irrevocably committed upfront before the project becomes operational. The gestation period is long; revenue streams are slow to pour in.

• **High costs of entry and exit** reduce competitiveness and hence “contestability”\(^4\) of infrastructure services.

• The services produced are non-tradables. Consequently excess demands cannot be met by importing. Likewise excess supplies cannot be exported. The non-exportability of services also implies that investments generate only...

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\(^1\) Munnell (1990), Uchimura and Gao (1993), Easterly and Rebelo (1993) as quoted in the world development report (1994). These figures are contested in some other studies. It would be interesting to explore whether the differences in rates of returns are a result of inclusion of externalities from such investment in some of the studies. Further, there is raging debate on whether infrastructure investment causes growth or growth causes infrastructure investment, is not fully established.


\(^3\) Ahmed and Hossain (1990) and Binswanger et al (1989) as quoted in the world development report (1994)

\(^4\) Baumol's “theory of contestable markets” suggests that the threat of entry coupled with the possibility of exit is sufficient to restrain even a single incumbent producer in the market from reaping monopoly profits. It is the threat of entry that acts as a regulator. However the theory is based on a number of rather strong assumptions. Baumol, W J (1982) American economic review 72.
local currency revenues. This makes the availability of foreign exchange for repayments of external obligations, in the absence of capital account convertibility, subject to government intervention.

- The sector is vulnerable to regulatory and policy changes. What is specific in the case of infrastructure is the existence, in most cases, of politically sensitive tariffs. For instance, most states supply electricity at virtually no charge to agricultural users.

1.3. Uniqueness of Infrastructure Financing

At the outset, it may be underscored that infrastructure financing is different from the traditional asset-based financing in a number of ways, with the former being more complex and risky, as the funding structure mostly relies on future cash flows from a specific infrastructure asset as the primary source of repayment. These peculiarities indicate that clearly infrastructure provision need to be differentiated from those of non-infrastructure. The characteristics specific to infrastructure investments make them vulnerable to certain risks. In the traditional forms of infrastructure provision by the public sector, it was the government that bore all of the risks. However, private provision calls for a much more careful assessment and allocation of the risks. Risks must be allocated to and thus borne by those who are best suited to mitigate them. Only then can an infrastructure project become viable. To illustrate the issues of risk analysis and mitigation it is worth considering Project finance as a mechanism/model for private financing of infrastructure. It has been explained and analysed exhaustively in the subsequent chapters. What must be borne in mind is that no one model can be expected to fit in as a universal elixir for the problem of infrastructure financing. That is probably the reason why global banks call this sphere of financing as 'Structured Finance' and create groups by pooling expertise, synergy and homogeneity to functions.

Projects are not homogenous. Neither are solutions. Characteristics differ between different sectors and within each sector between different phases of the project. The nature of private/public participation varies as do the financing requirements. The finance has to be disaggregated by origin (foreign and domestic), sectors (public, private and joint), by techniques and instruments of finance and by the type of finance, i.e., new investment, maintenance and working capital. Infrastructure financing is, therefore, really a portmanteau concept embodying different elements and
characteristics requiring different approaches and tools which is what makes it unique. For a researcher/modeller, it is a veritable minefield which would call for understanding and analysing of these myriad issues to even attempt a solution. The increased acceptance of private financing in infrastructure has begun to shift the focus of the debate from the 'why' to 'how'. This has fuelled the demand for lessons on best practices in reform strategies, regulatory frameworks, institutional and financing arrangements and risk mitigation. For policy makers, private investors, banks and FIs and consumers alike, the key challenge is to use the positive and negative lessons learnt from the experiences of other countries and sectors. This will help in devising arrangements for private participation that are fair, predictable and sustainable and above all, that deliver better services with greater efficiency.

In the changed Indian economic environment, it is imperative that all the participants concerned, including the regulators, co-ordinating agencies and other authorities in infrastructure financing equip themselves with the necessary expertise in dealing with the aspects related to bank and institutional financing to infrastructure. In the Indian context, as the government’s capacity to raise finance is increasingly constrained by fiscal considerations, coupled with poor performance and pricing of publicly owned infrastructure facilities, the importance of private finance has become crucial. The role of money and capital markets in channelling the private savings into economic activities hardly needs emphasis. Given the present status of the Indian money and capital markets in channelling the private savings into economic activities, which are known for their shallowness and imperfection (particularly the debt markets), it would be very difficult to expect these segments of the financial market to cater to the financing needs of private infrastructure companies in a big way.

In this scenario, Indian banks and FIs with their huge resource base would naturally become the primary source of infrastructure finance. While Indian banks and FIs do finance private infrastructure projects, they have long way to go. Clearly, the path to be trodden by Indian banks and FIs is bumpy and subject to a number of risks. The success of Indian banks and FIs in insulating themselves against the potential losses in pursuing the uncharted path lies in developing expertise to understand the complexities of infrastructure finance. As they say, the secret of success lies in learning from others' mistakes and experiences.

Before venturing in to financing issues of infrastructure projects, it is necessary to understand certain basic facts about infrastructure projects. More importantly, the
lender should look at the infrastructure sector from different dimensions so as to take a holistic view. Better understanding of the sectoral dynamics from different perspectives would help the lender greatly in his efforts to quantify and manage the risk arising out of various factors. Further, the infrastructure sector has its own unique features which are not found in the other sectors of the economy. The lender’s views on a project should be based on a wider canvas and therefore, he should appreciate the inter-linkages of the sector with socio-cultural, political and economic factors. The lender should also keep in mind the historical development, evolution of the sector, key-drivers of commercialisation of infrastructure, contemporary scenario at local, state, national and international levels.

1.4 Traditional ways of provisioning and financing infrastructure

Traditionally, infrastructure has been provided by the government, with the government bearing the investment risk. Government’s budgetary support for the infrastructure sector through tax revenue and government borrowing has been the predominant source of finance. Developing countries have also received finance (concessional and non-concessional) from bilateral and multilateral sources.

The reason for this traditional model of infrastructure provision have hinged on the:

- natural monopoly features of many of these services;
- public good characteristics which make revenue collection to recoup the investment very difficult;
- spill-overs /externalities both negative (emissions from fossil fuels) and positive (promotion of social equity through investments in rural infrastructure) that possibly lead to a divergence between social and private costs (and benefits). Thus, these services may be over/under provided – a case for a role for public investments based on a social cost-benefit analysis.

Alongside these theoretical reasons, was the consideration that the large investment requirement and long gestation periods would serve as a serious disincentive to private initiative. The governments in developing countries, on the other hand, have been trying to meet the required investment albeit with very limited success. India’s case isn’t any different and latest data on infrastructure spends proves that it is still very low on everyone’s plan though many talk about it. During the liberalisation era, infrastructure investment has generally taken a severe beating, but the situation
improved somewhat in the last fiscal, according to the latest data of the CSO (central statistical organisation). Gross capital formation (GCF) in infrastructure industries has recovered marginally in '00-01 to 4.6 percent of GDP from 4.2 percent in the previous year, though it remains far lower than the level of 6.5 percent of GDP in '91-92.

Classification of infrastructure investment between the public sector and the private sector is available only till '98-99. It shows that both the sectors have been reluctant to invest heavily in the infrastructure sector. The public sector’s investment in capital formation has fallen from 4.4 percent of GDP in '91-92 to 3 percent in 98-99. The private sector’s investment also fell from an already lower level of 2.1 percent of GDP in 91-92 to 1.3 percent in '98-99. For the purpose of this analysis, gross capital formation (GCF) in electricity, gas & water supply and transportation, communications, storage and distribution has been considered as investment in infrastructure. These sectors were selected on the basis of the core nature of these activities.

That the infrastructure investment is low on the government's agenda now is also reflected in the central government’s expenditure allocation for infrastructure. It fell from 26 percent of its total expenditure in '91-92 to 16 percent in '00-01, registering a drop of 63 percent in the share. This could be due to two reasons-first, the government’s policy of moving out of infrastructure and allowing the entry of private and foreign participation in this sector and second, its attempts to curb the deficit by cutting down on plan capital expenditure. In relative terms, state governments have not followed in the footsteps of the centre in reducing the commitment to infrastructure development. Thus, state governments’ expenditure on capital formation fell only marginally from 19 percent of the total expenditure in '93-94 to 17 percent in '00-01.

The expectation that the space vacated by the public sector would be occupied by the private sector has clearly not been met, perhaps due to unclear policies. The inability of the private sector infrastructure projects to take off in a big away has again brought into focus the need for enhanced government investments in these areas. The recent report on currency and finance by the Reserve Bank of India (RBI) has attempted to quantify the role of public investment in the growth process. It estimated the traditional production function for the manufacturing sector by adding public investment as an additional variable. "the public capital in infrastructure emerges as the most dominant factor in explaining output growth in the manufacturing sector," says the report. Public provision has, however, had its many problems. Lack of accountability has led to poor
management and cost overruns. The emphasis has been on new projects with little focus on completion of existing projects within a time schedule. Further operation and maintenance has been neglected, both in budgetary allocations as well as in externally aided projects. A backlog of unmet demands remain to be met.

The more fundamental problems with public sector provision of infrastructure, however, relates to the macro-economic constraints on the government; a BOP problem with a widening deficit on the current account; a fiscal deficit that the IMF fears will touch the 10% level despite the government’s announcements at aiming at a 4% level. Paradoxically, despite their recognized importance, capital expenditure, mostly infrastructure outlays, are the most vulnerable to cuts in government budgets during periods of adjustments and fiscal austerity. This is true of both developed and developing countries, reflecting a familiar political problem that governments find it easier to cut capital as against current expenditure. What exacerbates the financing problem is inadequate cost recovery owing largely to a politically sensitive tariff structure with large elements of subsidization and cross-subsidization (across different users) and a general aversion to a tariff revision.

These reasons necessitate a rethinking on infrastructure provision and serve as a pointer to an increased role for private sector participation. What has facilitated such private sector provision are technical and financial innovations. Technical developments allow for unbundling of infrastructure services. Unbundling along with deregulation allows for private entry and competition. The economies of large-scale production and delivery (the natural monopolies argument), although still important in some infrastructure activities, have diminished specially in power generation and telecommunications leading to the possibility of an unbundling –the separation of activities in which economies of scale are not important, and hence can be provided competitively , from those in which they are. This technological possibility of unbundling will allow for private sector participation, creating a quasi –competitive environment where some aspects, power generation and provision of value-added services for instance, will be directly provided for by the private sector.

The world development report 1994 points out that international donor policies and practices often reinforce distortions in recipient countries. With full or partial tying of aid, donor objectives (such as seeking contracts for capital goods supply or consultancy services) play a part in preference for new investment over maintenance.

The term unbundling refers to segregating the sectoral functions into identifiable units like for eg., in the Power sector, separating generation, transmission, distribution and possibly retailing to achieve maximum benefits for the consumer.
1.5 The Transitional paths

The exact nature and route to private sector participation is a contentious issue, depending critically on political commitment, strength of opposition to change, institutional capabilities, investor's perceptions and the domestic and legal environment. Further different infrastructure sub-sectors need to be addressed in different ways. No single blueprint exists. The sectoral unbundling discussed above, coupled with deregulation, is one of the possible routes to private sector participation. It is an approach that has it's advantages for "beginners" in terms of its low political and regulatory costs. Unlike the divestiture route, many of the existing assets remain under State ownership. In contractual agreements like Build-Operate-Transfer (BOT) and Build-Operate-Lease-Transfer (BOLT), the ownership of the new assets created by the private sector is subsequently transferred back to the government. Regulatory costs too are low since each new project is a contract- based relationship allowing for a postponement of a wholesale regulatory change.

In such a backdrop of transition, this study examines major infrastructure sectors like power, water supply, roads, ports and airports and de-lineates practices to analyse and understand risks involved so that Risk Management solutions are possible in the infrastructure financing arena. As incidental to the macro framework of the study many related aspects like: (i) sector policy issues relating to pricing and competition; (ii) conducive legal and regulatory frameworks; (iii) the unbundling, mitigating, and management of risks; and (iv) mechanisms to reduce transaction costs have also been looked into.

1.6 Definition

The term ‘infrastructure’ can be broadly defined to include all the facilities/services necessary to conduct daily life, for example power, education and health facilities, etc. Contemporary wisdom classifies infrastructure as: (i) social infrastructure and (ii) economic infrastructure; to mean a school, hospital, water, sewerage etc., as social and to mean a road, power, transport, telecommunication etc., as commercial. A somewhat ownership-based classification also exists, which classifies it as (i) Public Infrastructure and (ii) Private Infrastructure. The distinction in these classification is often elusive. With commercialisation, even many so-called social necessities like water or say educating the masses have become economic in nature. It may also be that what is social for some is economic value for others. The distinction based on
ownership is furthermore elusive. We speak of a park or a government office building as being publicly owned, but we use the same term to describe Infosys, as it has many stockholders and any member of the public may buy part of the company: That is to say that it is a private company that is publicly owned. In the same way, a public restaurant is one that caters to the public at large, although it may be owned by a sole-proprietor. Confusingly, we use the same word, public, to describe three very different conditions: government-ownership, widespread-ownership, and open access. This semantic confusion is nevertheless instructive, for it implies that government ownership – and by extension, government action – is not necessary to achieve widespread (i.e., “public”) benefits. May be Privatization or Public-Private Partnerships (PPP) as it is called in the infrastructure spectrum, capitalizes on this under-appreciated truism and takes advantage of the full array of ownership and operating relations to satisfy people’s wants and needs and thereby to serve the public interest.

An exhaustive list of infrastructure facilities would consist of the following:

- b. Telecommunication.
- c. Transport – Road, Ports, Airports.
- d. Urban infrastructure.
  (1) Rapid Transport for Metros.
  (2) Townships/ satellite towns.
  (3) Water supply/sewerage.
- e. Railway.
- f. Education.
- g. Health care.
- h. Fuel/Energy – Coal/ Petroleum/Other energy sources.
- i. Irrigation.
- j. Inland waterways.

Under income Tax Act, 1961 (as amended by Finance Act 1999), infrastructure facility would mean:

- a. A Road, highway, bridge, airport, port, rail system or water supply project, irrigation project, sanitation and sewerage system or any other notified public facility of a similar nature.
b. An industrial undertaking set up in any part of India for the generation and distribution of power which begins to generate power during 1.4.1993 to 31.3.2003, or an industrial undertaking which starts transmission or distribution by laying a network any time during 1.4.1999 to 31.3.2003.

c. A project for providing telecommunication services on or after 1.4.1995.

d. A housing project covered under section 80-1B(10)

e. An undertaking for developing, developing and operating or maintaining and operating a notified industrial park.

RBI for its regulatory purpose has also adopted the above mentioned definition. However, in this Report the term 'economic infrastructure' has been narrowed down and refers to four infrastructure sectors: power, transportation (roads, railways, ports and airports), telecommunication, and urban infrastructure, which are central to the economic activities.

In this chapter some fundamental aspects of the infrastructure sector have been discussed to provide a better understanding of it. While the analysis and discussions made here are general and universally applicable, wherever warranted, issues of relevance in the Indian context and sector specific issues have been elaborated.

1.7. Statement of the problem

To understand the research problem better it is worth considering, how the financing of infrastructure and the flow of investments works in the present set up. This can be conceptualised as depicted in Figure 1.1.
Broadly infrastructure can be divided into economic infrastructure and social infrastructure and the investments in infrastructure is through public, private and joint sector investment flows. As far as public investments are concerned it occurs at national level, sub-national level and by local bodies. The financing mechanism is through...
deficit financing, public debt and taxes. The risk of financing through these mechanism leading towards profits and losses need to be analysed. Similarly, the risks can be analysed in the case of joint sector investments.

The more important analysis should pertain to private investments, especially in the context of economic liberalisation. The flow of private investments in infrastructure is by foreign investors in one hand and by domestic investors on the other. It can also be through joint venture participation by these entities.

The foreign investments can take the form of direct investment or through portfolio participation. It is imperative here to analyse the investments as to whether it is financed through owned capital or borrowed capital and thereby analyse the risks involved. Quantifying these risks are equally important to analyse the influences of the numerous variables and to come out with risk management practices. Thus spotting, allocating and mitigating these risks is the central feature of private infrastructure financing and the problem areas of this research tries to analyse exactly that.

1.8 Topical Relevance

So much so being the subject matter of infrastructure financing –it is against this backdrop this research proposal is conceived and has topical relevance to the fast changing economic conditions of the country in general and project financing in particular. But, unfortunately, there have not been many studies which have recorded the past experiences from the lenders’ perspective. In the Indian context there are hardly any serious studies in this regard excepting, of course, ‘The India Infrastructure Report’, which raises issues at the industry and economic policy level. Hence, there is a need for undertaking a study that would exclusively look at infrastructure financing from lenders’ perspective.

1.9 Scope and Framework of the Study

The infrastructure sector, being a very vast area, can be studied from different perspectives. The scope of this study is primarily to look at the financing issues of economic infrastructure projects from lending banker’s perspective. Indian banks are on a learning curve in so far as understanding the mechanics of the infrastructure financing. For that matter, so are the project promoters, policy makers and regulators.
The lack of expertise resulting in poor confidence level of lenders contributes in impeding the growth of the infrastructure financing market.

This study, therefore, is an exercise to explore the international best practices pursued by international bankers and other connected institutions in financing infrastructure projects. The need of the hour is how fast and how effectively Indian banks can strategise themselves and meet the financing needs of the infrastructure market. It needs to be appreciated that infrastructure financing is an emerging area, and banks and FIs, which are currently undergoing metamorphosis, are in a position to capitalize on the new financing opportunities available.

Apart from aiming to address the relevant financing issues, the Study also intends to discuss some of the incidental aspects such as regulatory policies and sector specific issues in the Indian context. This, however, is again limited to those issues that are germane to Indian banks and FIs. The Study covers general financing issues relating to five infrastructure sectors-power, telecom, transportation (roads, ports, airports) and urban infrastructure- which are central to economic activity and water which is an important social infrastructure. Wherever the term ‘infrastructure’ is used, the same shall refer to the infrastructure with the above referred ambit. For the purpose of this Study, Indian Banks and FIs have been treated in the same manner. The reason for tagging FIs with banks for the purpose of this Study needs some elaboration. While ‘Indian banks’ mean all scheduled commercial Banks (including foreign banks but excluding Regional Rural Banks), the term ‘FIs’ mainly refers to the major development financial institutions in the infrastructure sector viz. IDFC (Infrastructure Development and Finance Company), ILFS (Infrastructure Leasing and Financial Services), IDBI (Industrial Development Bank of India), ICICI, HUDCO (Housing and Urban Development Corporation), IFCI. The process of financial sector reform has led to significant changes in the working of banks and FIs. More particularly, deregulation of interest rates, dis-intermediation, increased autonomy to banks in credit decisions and inter penetration of banks and FIs into term loan/project finance and working capital segment have significantly altered the operating environment of both banks and FIs. In the changed scenario, the FIs are clamouring for commercial bank status and a few have already adopted ‘universal banking’ as their business model. In this context, it has to be mentioned that the Khan working Group has also advocated harmonising the role and operations of FIs and banks. This has bearing on areas like infrastructure finance in the coming years.
1.10. Nature of the study

The proposed research is highly exploratory in nature. An empirical study on risk analysis being a key element in infrastructure financing, it has a high scope for its applicability in an emerging market like India which lacks expertise in it. Furthermore, the topic selected has high interface with all the macroeconomic indicators and many functional areas of management, (incl. Infrastructure management) in its scope and applicability. From the current state of Public Ownership by Government the forms it can take can be conceptualised as follows:

- **Public Ownership**
  - **Privatization**
    - Selling Assets
  - **Commercialization**
    - Sweating Assets
  - **Private financing of Public Infrastructure (PFPI)**
    - Paying for Services