INFRASTRUCTURE FINANCING

CHALLENGES OF RESTRUCTURING

Prof.Vikas Srivastava

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"Research is the process of going up alleys to see if they are blind."

■ *Marston Bates*

As I complete an enriching voyage which is of course life changing, the above words by Marston Bates truly describes my feelings. The last 12 months has been sometimes forward and sometimes backward kind of a journey, but nevertheless extremely rewarding as I started enjoying the habit of taking up and doing work on a certain new dimension (alley) and then restarting all over again, if I found it to be a blind one.

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As I dedicate this research report to the Indian banking industry, I would be happy if my research., in a small little measure helps the banks to strengthen financing to infrastructure sector, thereby helping India to take its rightful place in the world economic order.

(Dr. Vikas Srivastava)

October 4, 2013

INFRASTRUCTURE FINANCE: CHALLENGES OF RESTRUCTURING

Abstract of Key Results and Recommendations

The Indian Economy is currently going through a challenging phase as GDP growth has slowed down to nearly a decade low in 2012-13. Infrastructure spend is likely to have a positive spiral and multiplier effect to the GDP growth and is likely to be one of the main lever to unleash India's economic growth potential.

According to initial estimates of the XIIth Plan, in order to sustain GDP growth rate of 9%, the planned investment was Rs. 41, 00,000 crores in Infrastructure sector. The Approach Paper for the 12th Plan envisages that about half of the investment requirements of infrastructure would have to be met through funding from the private sector. For this purpose, the share of private sector in infrastructure investment will have to rise substantially from about 37 per cent in the 11th Plan to about 48 per cent in the 12th Plan.

Lately, however, the private sector's interest in the infrastructure sector has, however, been badly hit because of the delays due to certain policy formulations and implementation aspects relating to land acquisition, rehabilitation, environment etc. At present, more than 50 per cent of projects are stuck at various stages of implementation due to variety of regulatory hurdles and sector specific bottlenecks leading to significant time and cost overruns. These estimates are likely to be revised as we see funding gaps in this sector and a slowing economy.

Lack of depth in the financing market, lack of innovation in financial instruments, slow development of alternate sources of finance as well as project quality have continued to remain the top Industry challenges. Uncertainty in the credit markets is impacting the ability of infrastructure developers to raise finance for infrastructure projects and undermining confidence in private finance models. These ongoing liquidity issues are likely to increase financing costs associated with certain delivery models.

In the light of lack of other long term funding alternatives and increasing participation by the private sector, bank credit has been playing a critical role in infrastructure financing. Apart

from budgetary support that accounts for about 45 per cent of the total infrastructure spending, commercial banks are the second largest source of finance for infrastructure (about 24 per cent). Historically, it is the commercial, more particularly, the public sector banks that have supported the infrastructure requirements of a growing Indian economy. Outstanding bank credit to the infrastructure sector, which stood at Rs. 72.43 billion in 1999-2000, has increased steadily to Rs. 7860.45 bn in 2012-13, a compounded annual growth rate (CAGR) of 43.41 per cent over the last thirteen years against an overall CAGR of bank finance to all industries at 20.38 per cent during the same period. The share of bank finance to infrastructure in gross bank credit has increased from 1.63 per cent in 2001 to 13.37 per cent in 2013. Between March 2008 and 2013 alone, banks' exposure to infrastructure has grown by more than 3 times. This apart, credit has also flown into infrastructure sector via NBFCs, Mutual Funds and capital markets, the source of bulk of which is bank finance.

But it is only now, in the light of the economic downturn that the Challenges of restructuring in this sector has come to fore.

The present economic downturn as well as the increase in overall construction cost has pushed a majority of the private sector infrastructure companies (that the banks were financing) to a tight liquidity position. Some of the companies are on the verge of collapse due to reasons such as aggressive bidding, absence of traffic revenue as projected, delays in land acquisition, hurdles encountered in obtaining environmental clearances and utility shifting and failure to hand over Right of Way (ROW) by the Government on time. Other concerns of companies include delays in honoring price variations, escalations, change of scope etc. The Gross NPAs and restructured standard advances for the infrastructure sector, together as a percentage of total advances to the sector, has increased considerably from Rs. 121.90 bn (4.66%) as at the end of March 2009 to Rs.1369.70 bn (17.43%) as at the end of March 2013.

The present research has a focus on elaborating all stakeholder issues involved in restructuring of Infrastructure loans so that a holistic understanding of restructuring challenges in this sector is developed. The research will focus on the rising cost of equity for promoters in the light of high debt equity ratio employed in these projects, making it

more difficult for promoters to bring in upfront equity; structural, appraisal and follow up issues from the perspective of Indian banks; regulatory and environmental constraints and the role of Public Private Partnerships and finally the Debt restructuring mechanism and its effectiveness. 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

Most of infrastructure loans are structured as Project Finance which differs from traditional corporate finance in terms of leverage and structure.

Project Finance: Right Financing Structure for an Infrastructure asset?

Project Finance is a well-established technique for large capital intensive projects. Project Financing involves raising of funds to finance an economically separable capital investment project in which the providers of funds look primarily to the cash flow from the project as the source of funds to service their loans and provide the returns to the equity investors.

In case of capital intensive infrastructure projects, it involves financing of projects on standalone basis often on non-recourse or limited recourse basis (no or limited support of sponsors/promoters balance sheet)and is suitable for great variety of capital investments including roads, pipelines, refineries, electric power generating facilities, hydroelectric projects, mines, mineral processing etc.

The term project financing is widely misused and perhaps even more widely misunderstood. It is important to clarify what the term Project Finance does not mean. Project Financing is not a means to raising funds to finance a project which is so weak economically that it may not be able to service its debt or provide an acceptable rate of return to its equity investors.

To conclude, the following important points from the literature review must be appreciated by the lenders:

- Infrastructure assets are large investments, risky, single purpose and stand alone. **For such capital intensive assets, it is important for the sponsors to financially and organizationally make them distinct from their existing balance sheets.** The reason

is that **bankruptcy remoteness** is critical in developing such large assets for the existing debt and equity providers on the sponsor(s) balance sheets.

- **The non recourse aspect is thus prized for the sponsor as it does not lead to contamination of existing balance sheet**. However, non recourse does not mean that the sponsor will also not give managerial and technical support to the project. For a lender it is critical to understand, that till the time the project doesn't pass the "Completion Test" both physical and financial, the recourse should be limited to a contingent situation in amount, time and event.

- **A lender must also appreciate that many a times these large infrastructure assets work as "Utilities", which means at least theoretically their offtake (cash flows resulting from project) is guaranteed as they are monopolistic in nature without much technological glitches.**

- So, in case of a utility, a high leverage ratio may be justified. Debt funding has three advantages, a tax shield on the interest, increased discipline of debt (mangers don't run amok because of debt covenants) and a lower cost of capital. So if you increase the debt equity ratio, the cost of capital for the project decreases as cost of debt is less than equity and the projects are largely funded by debt. But traditional corporate finance theory says that because of increased bankruptcy costs as a result of higher debt, the cost of equity starts increasing at a higher rate. Now, herein Project Finance is slightly different from Corporate Finance. If the cash flows are guaranteed, because the project works like utility, the direct and indirect bankruptcy costs are minimum. So, the project vehicle takes the advantages of debt, while minimizing disadvantages.

- In addition to this, project financing structure allows for optimum risk sharing, allocation and mitigation. On one hand, though the lenders don't get tangible collaterals, the contractual structure and control on project assets and cash flows works like a second line of defense.

- This structure allows lenders to take control on project assets and parties and also the cash flows through a Trust and Retention and Escrow accounts.

- Knowledge of the risks and the structures of project finance to handle risk are paramount in achieving the best deal for both sides. A project financing deal requires

careful financial engineering to allocate the risks and rewards among the involved parties in a manner that is mutually acceptable.

This calls for a complete paradigm shift in Project Appraisal skills of the bankers from being a collateral/security driven appraisal to cash flow and documentation based assessment. Project Finance is predicated on the necessity to organize each risk class, to assist in identification, as a means to structure the many solutions that could be deployed to address each risk facet. Risk in project Finance is a matter of heavy negotiation and trade off. Risk allocation is not just about allocating risk to "the party best able to bear it". It is negotiated as far away as possible and mitigated in such a manner that it cannot spring back.

Project Finance, as is evidently clear from the above discussion, finds itself as a preferred financing technique for infrastructure assets.

Final Inferences from Research and Recommendation for Banks

- The survey results show during the process of appraisal, bankers are well aware of the Project Structure as well as the sectoral challenges/risks facing them. What is emerging out of the survey is that though the banks are quite aware of the issues, but then a very few banks have the expertise and skill sets required to identify risks sectorally, create the right kind of contracts and documents to allocate and share risks and then mitigate it. (That is why a few banks are in the Asia League Tables).

- Also in terms of classification, there is a confusion regarding Project Finance and Corporate Finance. Project finance consists of Government, Corporations and PPP financing investments solely through the revenue stream/cash flows of the infrastructure projects without taking recourse to government guarantees or parent company's/Sponsors balance sheet or collaterals. 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.

- If Projects funded by banks are not classified as Project Finance, then in times to come , the banking system may not have the data base to measure Probability of Default (PD) and Loss Given Default (LGD) using a Bank specific Project Finance Rating Model as required to move to Advanced IRB approaches for Project Finance loans.(Herein, it is important to remember that Project Finance is preferred for building Infrastructure Assets).

- In the light of capital charges for Specialised Lending (Project Finance) as per Advanced IRB approach, more sophisticated banks using Advanced IRB approaches might be able to underprice other banks using the Foundation approach which are subject to lower risk weight. In case of defaults and repeated restructuring, the capital charges may be prohibitive for some banks. What may result from this guideline is that, if we keep the spreads constant a higher capital charge may result in negative returns for some banks.

- Banks Capital need to be further strengthened to avoid concentration risk. But till the time Government is willing to relax its majority holding in Public Sector Banks, Tier I capital has to be strengthened largely by Budgetary allocations. Therefore Banks with smaller balance sheet size need to have a relook into their Infrastructure Finance Portfolios.

- Syndication of loans is essentially done to share and distribute risks and also revalidate the appraisal, structure and documentation of the project . It needs strengthening of appraisal capacity in banks. There are instances when a major contributing factor of the decision to participate in syndication is the reputation of the lead syndicator/banker.

- What needs to be done is creation of specialised cadre of credit officers in banks especially Public Sector Banks with sector wise specialisation who understand the core rationale of using non/limited recourse debt driven Project Finance to fund capital intensive projects and look at Contracts and Documents as a means to achieve risk sharing and mitigation.

- This sector wise specialisation in credit officers will bring in an understanding that repayment schedules need to be sculpted around the nature of sector wise cash flows. In Project Finance, risks are not directly proportional to spreads. Cash flows are modeled and using cash sweeps and traps often risk is mitigated. This would bring in more accuracy to cash flow projections and sector specific credit officers can then question the assumptions that have gone into creating a cash flow model.

- Financing of infrastructure by banks and financial institutions 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 risk. Floating rate loans with appropriately priced hedges are often a solution.

- Swap market development particularly Interest Rate swaps needs to be done for term transformation and hedging. Currently the swap markets are not entirely performing the role of term transformation and hedging.

- Securitisation of loan portfolios may be looked in as an alternative to spread risks more widely and free capital. Needless to say proper regulation and supervision needs to be in place to prevent perverse incentives to kick in.

- Needless to say that along with bank finance in this sector, there is a need for Infrastructure Development Funds (already launched), Take out Financing and credit enhancement products. These debt funds can attract participation from other institutions who have long term funds like Insurance and Pension Funds.

- In this regard, Infrastructure Focused NBFCs can play a bigger role in loan origination and onward lending.

- But for all of this a low cost wholesale debt market segment needs to be active. In this regard an active bond market is required. In India, the bond market is privately placed bond market rather than a public bond market and there is an overcrowding effect of Government Treasury Bills. Patil Committee Recommendations may be looked into.

- However, it is critical to understand, that there are two kind of borrowers from the debt market. One, Companies with a large operating asset base in

Infrastructure space, which includes large Public and Private sector companies in energy and oil. For them, it is easier to raise money through the bond markets, including international markets, where tenure may be 30 years plus and at good price levels. However even if the issues regarding withholding taxes are addressed, they may find it difficult to raise money. The other kind of borrower are newly created SPV's with hardly any networth. For them to raise money from the bond markets, even if it is well developed would be tough as they will not get Investment grade ratings to start off with. In this manner credit enhancements by agencies like IIFCL may work, but what is critical here is that bank finance may remain as a source of initial risk capital.

- Therefore what is more important is to address the issues in takeout financing, including domestic and through the External Commercial Borrowing route. In this light, the creation of Infrastructure Development Funds is a good step.

- The inflows from ECB's have been rising, however such inflows have sectoral cap, end-use restrictions and interest rate cap. The cap on interest cost for ECBs makes it difficult for the borrowers to raise senior debt, subordinated debt and mezzanine debt as the maximum permissible return is not considered good enough to match the perceived risk. The risk perception of Infrastructure projects in India is high due to lower country rating and project rating issues.

Final Inferences and Recommendation for Infrastructure Companies

- It is clear that the representative sample of Infrastructure companies in India have leveraged their balance sheets much above the optimum debt taking capacities on a given level of cash flows and assets.

- When we use Project Finance believing that Risk structuring and allocation can minimize increased risk of assets, it cannot essentially work in projects with flawed economics and politically sensitive macro environments as offtake of cash flows become volatile.

- Therefore, this volatility in cash flows has resulted in higher Bankruptcy costs, which has resulted in a rise in higher risk premiums leading to higher cost of equity and debt. Needless to say, that then the Weighted Average Cost of Capital has also risen. Now if this increased Cost of Capital is used as a discount rate,

many infrastructure projects may become unviable for promoters in terms of Equity IRR and Project IRR.

- This means that with this rise in Cost of Equity, it may not be feasible for the promoters of these companies to raise further equity from the market. Thus Projects may be debt driven in future as well.

- Therefore in the present situation, the corporate is increasingly resorting to a behavior called as "Risk Shifting" whereas the incentive to shift risk of riskier assets to debt providers will rise. They keep on hoping for the upside on riskier assets (thus more and more riskier assets are built on overleveraged balance sheets) and in the present situation, it may be difficult get that upside.

- This is more apparent when corporate often bid high for projects which are risky with uncertain cash flows and then ask for sweeteners from the Government.

- However, all of this may still work out in favour, if the cash flows from the stalled projects start flowing and therefore the role of Government and Various sectoral regulatory authorities become important. It is important to note here that even if there is a delay in project achieving start of commercial operations, it leads to delayed cash flow buildup leading to stress for both debt and equity providers.

- Lastly, this is one sector which faces severe manpower shortage for engineers who specialize in Construction and Project Management. This often results in confusion over the fixing up of Declared Commencement of Commercial operations date (DCCO). A good Project Manager may try to use several techniques to complete the project in time. Asset classification in banks is linked to DCCO, and this often a problem for bankers if DCCO is changed on account of inadequacies in Project Management.

Final Inferences and Recommendation after studying the role of Public Public Partnership (PPP) and Government

- There should be a clear picture of economics and Physicals of the projects.
- Land identification should be done by Government and acquisition price to be indicated to the bidder at the project bidding stage. The Letter of Acceptance (LOA) should be issued to bidders and contractors only when land acquisition is complete in all respects. This will help in build up of utilities also.

- The scope, terms of reference and obligatory process of environmental clearance and procedures should be standardized by Ministry of Environment & Forests to enable faster environmental clearances. This requires coordination in actions and policies of Central and State Governments and even within Central Ministries needs to be better coordinated.

- Frequent changes in Model Concession Agreement, Request For Proposal (RFP) and Request For Quotation (RFQ) norms should be avoided as it makes project implementation difficult and results in bidders spending a lot of time, effort and money in performing due diligence. Issues regarding Termination payments during period of construction should be addressed.

- Poor Quality of Detailed Project Report (DPR) - It is recommended that the DPRs prepared should be accurate and of good quality to enable better project planning and timely completion of project with minimum deviations. It is often felt that the attention that Government agencies like NHAI gives to DPRs has reduced over the years, as Government is more keen on projects in rural areas.

- Herein particularly sometimes the quality of traffic studies conducted for estimating traffic is suspect with reference to sample sizes used.

- A good quality DPR will ensure that the Government agency can come out with a range of Bids, that a bidder can quote. This will extreme overbidding by some ambitious corporate. The Government should then restrict any post bid negotiation.

- Public Partnership Projects are grounded in appropriate sharing and allocation of risks. Government should not therefore try to maximise returns by frequent revenue sharing models in projects that are sustainable even without revenue sharing and at lower user charges. Also un-forecastable risks like future fuel prices should not be passed entirely to private sector. In this way, it is critical for Government to smoothen out Fuel linkages and improve escrowability of off-take.

- In the light of the fact that confidence of the banking system and corporate needs to be brought back in this sector, the Government can think of a Political risk insurance cover on the lines that ECGC or MIGA offers to Indian corporate investing abroad. The Government may also consider setting set up a corpus, which would provide

support to a pool of projects. Such a corpus could be funded through budgetary allocation, contributions from multilateral agencies etc.

- The corpus could be used to create First Loss Default Guarantee Funds provide partial guarantees to lenders for certain projects which may need such support.

A small note on Corporate Debt Restructuring (CDR)Mechanism

As of June, lenders had approved CDR packages for 415 companies, with aggregate debt of Rs 2,50,279 crore. The iron and steel sector accounted for the most — Rs 53,543 crore. A year earlier, 309 cases, with aggregate debt of Rs 1,68,472 crore, were on the CDR platform. There has been concern on the growing number of companies opting for a debt recast. The Reserve Bank of India had implemented strict norms to ensure only genuine units took this route. However, the performances and operations of companies in the CDR cell are often overlooked. Many of these have been under CDR protection for years, without any incentive to move out. It brings to the fore an issue of lack of a detailed performance check at CDR as some corporate had remained in this platform for long and continued to enjoy "protection", without making any move to step out. The Government is set to carry out a performance review of companies that have opted for corporate debt restructuring. This follows various steps taken to curtail the virtually unchecked flow of CDR cases. **The following issues need immediate attention in the CDR cell**

- There is a need to do deeper strategic due diligence of problem accounts to locate tough management actions needed for turn around. In this bankers should only bear downside risks and upside risks have to borne by more equity from sponsors.
- At the financial analysis level, conversion of debt into equity may not be such a good idea on account of rising cost of equity as mentioned earlier and two, banks really are not into business of running companies. Also in addition to Loan Life Cover Ratios, Project Life cover ratios need to be calculated at a discount rate of Cost of debt. This will help in knowing residuals in Infrastructure Projects.
- After the debt has been recast, a proper monitoring mechanism is needed to ensure management follows through on tough decisions in operational turn around.

The cell must send out a message that CDR cell is not available till perpetuity. An effort can be made to restructure certain projects without CDR support.

INFRASTRUCTURE DEVELOPMENT AND FINANCING

1.1 Introduction

This chapter discusses the role of infrastructure in the growth and development of India and the need for massive investments in this sector. In the light of gaps in financing, identified in this chapter, the need for the government to commercialize infrastructure services and the methods employed for the same are highlighted. As the investments required are of high magnitude, the role of commercial banks in financing infrastructure and the constraints faced by them are noted.

1.2. Definitions of Infrastructure

Infrastructure is an umbrella term for many activities referred to as "social overhead capital" by economists such as Paul Rosenstein-Rodan, Ragan Nurkse and Albert Hirschman. Neither is the term precisely described, nor does it encompass activities that share technical features (such as economies of scale, etc.) and economic features (such as spill-over effects, etc) (Raghuraman, G, 1999). As per the India Infrastructure Report, 1996, Infrastructure is generally defined **as "the physical framework of facilities through which goods and services are provided to the public".** Its linkage to the economy is multiple and complex because infrastructure directly affects production and consumption, creates negative and positive spill-over effects (externalities) and involves large flow of expenditure. The physical infrastructure covers a wide spectrum of services like transportation, power generation, transmission and distribution, telecommunications, port-handling facilities, water supply, sewage disposal, urban mass transport systems and other urban infrastructure and irrigation. Social or service infrastructure includes medical, educational and other primary services.

The Reserve Bank of India (RBI) in its circular dated November 30, 2007 (DBOD no. BP.BC.52/21.04.048/2007-08) has defined Infrastructure as "Developing or developing and operating or developing, operating and maintaining an infrastructure facility in Energy, Logistics and Transportation, Telecom, Urban and Industrial Infrastructure, Agro Processing,

Construction for storage of Agro Products, Schools and Hospitals, Pipelines for Oil, Petroleum and Gas, Water and Sanitation." As per the World Bank, Infrastructure can deliver major benefits in promoting economic growth, poverty alleviation and environmental sustainability but only when it provides services that respond to effective demand and does so efficiently (*World Development Report*, World Bank, 1994).

RBI has since harmonised this definition and the new definition is as under:

A credit facility extended by lenders (i.e. banks and select AIFIs) to a borrower for exposure in the following infrastructure sub-sectors will qualify as 'infrastructure lending':

Sl.No.	Category		Infrastructure sub-sectors
1.	Transport	i.	Roads and bridges
		ii.	Ports
		iii.	Inland Waterways
		iv.	Airport
		v.	Railway Track, tunnels, viaducts, bridges[1]
		vi.	Urban Public Transport (except rolling stock in case of urban road transport)
2.	Energy	i.	Electricity Generation
		ii.	Electricity Transmission
		iii.	Electricity Distribution
		iv.	Oilpipelines
		v.	Oil/Gas/Liquefied Natural Gas (LNG) storage facility[2]
		vi.	Gas pipelines[3]
3.	Water & Sanitation	i.	Solid Waste Management
		ii.	Water supplypipelines
		iii.	Water treatment plants
		iv.	Sewage collection, treatment and disposal system

		v.	Irrigation (dams, channels, embankments etc)
		vi.	Storm Water Drainage System
4.	Communication	i.	Telecommunication (Fixed network)[4]
		ii.	Telecommunication towers
5.	Social and Commercial Infrastructure	i.	Education Institutions (capital stock)
		ii.	Hospitals (capital stock)[5]
		iii.	Three-star or higher category classified hotels located outside cities with population of more than 1 million
		iv.	Common infrastructure for industrial parks, SEZ, tourism facilitiesand agriculture markets
		v.	Fertilizer (Capital investment)
		vi.	Post harvest storage infrastructure for agriculture and horticultural produce includingcold storage
		vii.	Terminal markets
		viii.	Soil-testing laboratories
		ix.	Cold Chain[6]

1. Includes supporting terminal infrastructure such as loading/unloading terminals, stations and buildings

2. Includes strategic storage of crude oil

3. Includes city gas distribution network

4. Includes optic fibre/cable networks which provide broadband / internet

5. Includes Medical Colleges, Para Medical Training Institutes and Diagnostics Centres

6. Includes cold room facility for farm level pre-cooling, for preservation or storage of agriculture and allied produce, marine products and meat.

Infrastructure contributes to economic development both by increasing productivity and by providing amenities which enhance the quality of life of the citizens. The services provided lead to growth in production in several ways:

- Infrastructure services are intermediate inputs to production, and, any reduction in these input costs raises the profitability of production, thus permitting higher levels of output, income and employment.

- They raise the productivity of other factors, including labour and capital. Infrastructure is, therefore, often described as an "unpaid factor of production", since its availability leads to higher returns obtainable from other capital and labour.

Each sub-sector of the infrastructure is inherently unique in terms of its administrative and organizational structure, the regulatory framework governing its operations, the level of technology and the degree of commercialization. In addition, while some services, such as telecommunications, can be provided on a strictly commercial basis, others, like roads, are expected to be fully provided by the State or at least partly subsidized.

Infrastructure projects can be classified *vis-à-vis* their characteristics and the nature of their users as:

- *Open Access Projects* are those from which people cannot be easily excluded, such as water supply and intra-city flyovers.

- *Limited Access Projects* are those that can be provided on the basis of a person's ability to pay for them. Exclusion of categories of people who are unable to pay for such services would usually be feasible through the provision of alternate facilities.

1.3. Impact on Growth and Development

The availability of adequate infrastructure facilities is imperative for the overall economic development of a country. Infrastructure adequacy helps determine success in diversifying

production, expanding trade, coping with population growth, reducing poverty levels and improving environmental conditions.

In recent years, much research has been undertaken to estimating the productivity of infrastructure investments. Many studies, examining the link between aggregate infrastructure spending and Gross Domestic Product (GDP) growth, show very high returns in time-series analyses. However, the causality – does infrastructure investment cause growth or does growth cause infrastructure investment? – has not been fully established. A strong association nevertheless exists between the availability of certain services – telecommunications (in particular), power, paved roads, and access to safe water – and per capita GDP.

Research indicates that while total infrastructure stocks increase by 1 per cent with each 1 per cent increment in per capita GDP, household access to safe water increases by 0.3 per cent, paved roads by 0.8 per cent, power by 1.5 per cent and telecommunications by 1.7 per cent. (World Bank, 1994).

Typically, as incomes rise, the composition of infrastructure changes significantly. For low-income countries, basic infrastructure development is more important, which includes: water, irrigation, and (to a lesser extent) transportation. As economies mature, the basic consumption demands for water are mostly met; the share of agriculture in the economy generally shrinks; and more transport infrastructure is provided. On the other hand, in high-income countries the demand for power and telecommunications is much greater.

Production and Investment: The most productive activities in industry, agriculture and services **directly** use electricity, telecommunications, water and transport as intermediate inputs. Even in the informal sector, infrastructure would be a major share of business expenses. A measurable benefit of investment in infrastructure is the reduced cost to the users of each service unit consumed. This benefit is greater when the volume of service is characterized by economies of scale.

If enterprises are unable to realize the benefit of efficient generation of infrastructure services, they are forced to seek higher-cost alternatives that may have unfavorable impacts on profits and production levels. Unreliability (erratic water pressure, call interruptions,

etc.) and lack of access to infrastructure services leads to underutilization of the existing productive capacity and constrains short-run productive efficiency and output growth. Users are forced to invest in alternative sources such as captive power plants and tube wells, thereby raising capital costs. This has ripple effects, creating bottlenecks and slack capacity utilization in other sectors of the economy. Problems like under-maintenance of facilities and poor service quality shift the burden of infrastructure provision and increase the overall costs leading to outcomes which are not the most economically efficient.

Infrastructure is central to the basic patterns of demand and supply, and to the economy's ability to respond to changes in prices or endowments of other resources. The expansion of service, high-technology and financial sectors relative to manufacturing industries increases the demand for telecommunications; but these factors decrease the relative requirements for industrial waste disposal and transportation of manufacturing inputs and outputs.

Against this background, it is obvious that the size of investments and the managerial efforts needed to handle them effectively will be enormous. The manner in which these investments are selected, designed, funded, implemented and finally operated would have a critical impact on the quality of the services and have major macro-economic implications for the country. It is, therefore, appropriate to look at the past experiences around the world and draw lessons that can help improve the quality and cost-effectiveness of such investments.

1.4. Historical Perspective

However, it is of interest to note that the public sector was not always so dominant in infrastructure provision. During the 19th Century, a good deal of investment was made by the private sector. In some sense, we are coming back full circle after a hundred years!

In most countries, during the 19th Century, railway, canal, road, gas, power and water systems were initially privately owned, operated and funded. But with time, more and more infrastructure companies were regulated or nationalized. This pattern varied substantially across and within countries and sectors. In several cases, nationalized companies were re-privatized due to fiscal constraints – although usually only briefly.

Almost all the railroads in the United States and Latin America were built in the 19th Century by private investors. International capital markets worked well at that time and a good deal of financing was done through the sale of railway and other infrastructure bonds in London – the most vibrant capital market of the time. Associated land concessions and other lucrative rights were also common as a means of financing these investments.

Pressures to establish some kind of regulatory mechanism arose soon after the establishment of a new infrastructure network. Rail, gas and water networks all emerged during the first decades of the 19th century in Britain. The moves to limit wasteful competition regarding water and gas distribution by establishing monopoly franchises were started around 1820. Rent regulation came into existence with Gladstone's Railway Act, 1844, followed by dividend limitations – to 10 per cent – for gas and water companies under the 1847 Gas Works and Water Works Acts. Similarly, limits on prices or returns were introduced in Toronto (Canada) for town gas, and, in some States of the US railroad statutes were introduced around the middle of the 19th Century.

With the outbreak of World War I, many infrastructure firms were subject to some type of utility regulation or state ownership. There were also many bond failures, arising either from the failures of the infrastructure companies themselves or because of the war and other dislocations. The War and economic depression of 1929 gave another boost to nationalization and stricter regulatory controls, which further increased during the 1940s (World War II) and 1950s (Post War). Disenchantment with the performance of regulated or nationalized firms led again to the deregulation and privatization in many countries during the decade of the 1970s onwards.

Private provision of infrastructure inevitably requires strong and transparent regulation. Given the typical lack of competition in supply, prices need to be regulated in the interest of protecting the consumers. Similarly, because of the non-tradable nature of infrastructure services, there is no direct link with exchange rate changes; hence, foreign investors face exchange rate risk and expect some predictability in tariff setting. Service providers face commercial risk in terms of unpredictability of demand and other risks arising from regulatory framework itself. Thus, private enterprise entails considerable complexity giving

rise to significant increase in transaction costs for all parties involved. This has itself inhibited private players entering into the arena of infrastructure enterprise in a big way.

1.5. Commercialization of Infrastructure Services

A wave of privatization and deregulation has been sweeping infrastructure sectors around the planet. These bold new approaches promise improved efficiency and service quality. But the world had seen waves of private participation in infrastructure before, only to see reversion to state solutions. As observed in the previous paragraphs, the new wave began in the 1970s when the US started deregulating natural gas, power and airlines. During the 1980s, Chile, New Zealand and the UK implemented far-reaching deregulation and privatization of almost all infrastructure sectors. Since the late 1980s, at least 145 companies in 30 countries have been privatized and at least 146 new projects in 34 countries with significant private participation were initiated in the power sector alone. Many more initiatives have been undertaken in sectors where privatization is easier, such as waste management, airlines and surface transport services. Currently, more than a 1000 new private infrastructure projects are under consideration worldwide.

In many OECD and Latin American countries, the current flurry of privatization of the existing facilities is driven by disenchantment with the efficacy of state solutions, precarious government finances and political ideologies. Private provision of new facilities is also being pursued in developing countries where fiscal revenues are a low share of GDP, most notably in East Asia. The other key driver is technological change, which has always influenced the degree of competition.

While the specific motivations and circumstances vary from country to country and within countries by sectors, there are five basic pragmatic and non-ideology-related factors leading countries across the world to consider enhanced commercialization of infrastructure provisions (India Infrastructure Report, 1996).

1.5.1 Massive Investment Needs: Developing countries have to make massive investments of financial, human and managerial resources in infrastructure. Estimates vary substantially depending on definitions, methodology and source of information as well as assumptions of what needs can and should reasonably be met; hence, it may be useful to look at some

illustrative numbers. A recent World Bank study has estimated that developing countries as a whole invest about $200 billion per year in physical infrastructure facilities. This is about 4 per cent of their GDP. Roughly, four-fifths of this, or about $160 billion, is financed through domestic public resources, about one-sixth or about $25 billion through international development assistance and the remaining $15 billion through private capital. The private sector's share while still small is fast rising in many countries and sectors.

1.5.2 Managerial Constraints in the Public Sector: While there are well-performing public utilities in some countries, the quantity, quality, and cost-effectiveness of infrastructure services overall have not kept pace with the needs of either the general public or the business community in most countries. The public sector is unable to keep up with the myriad decisions and managerial challenges associated with the acceleration of investments at a time when the infrastructure business is becoming more complex.

Efficiency of investment has assumed new importance in the context of fiscal stringency. There is greater demand for accountability in public expenditures. When infrastructure facilities are developed by the State or State agencies, there is typically little connection between the cost of funds and the returns on the investment. Consequently, there is little accountability. Often, public sector entities are not good at responding to consumer needs owing to rigidities in their management structures, the necessity to follow government-set rules and regulations, and inappropriate incentive structures. Thus a need has arisen for commercialization and privatization of infrastructure in order to inject greater efficiency.

1.5.3 Changes in Technology: Changes in technology, particularly in telecommunications, computer and information technology and electronics now make it easier to charge for marginal usage of services. For example, in telecommunications, it is possible for different service providers to be linked through the same network to the ultimate consumer. Computerization allows the consumer to be charged on a marginal usage basis and each provider to be given revenues according to different use by different subscribers. Smart cards, electronic billing, etc., are making it possible to potentially charge for road usage on a marginal use basis without the disruption caused to traffic by toll booths. In the case of power too, it is now increasingly feasible for different service providers to have access to the same consumer over the same network according to the consumer's choice.

Computerization also enables power pricing to be much more sophisticated so that differential prices can be charged at different times of the day or according to the rate and type of consumers. It is also becoming possible to exclude those who do not pay without excessive disruption. The need for regulation is also reduced to the extent that more competition becomes possible.

Technology changes have also made it possible to unbundle infrastructure services. Today, different telecommunication services, such as international, domestic-long distance, local services, and other value-based services, can be provided by different firms. In power, it is now quite easy to separate generators from transmission providers and distributors. In general, greater opportunity for unbundling of services enables the increasing introduction of competition and therefore the possibility of participation by the private sector.

1.5.4 Globalization: Many surveys of trans-national corporations have indicated that the quality and cost of infrastructure is one of the primary considerations in their decisions as to where new investments should be located. In order to compete for Foreign Direct Investment (FDI), to facilitate exports, and more generally to improve their competitiveness, almost all East Asian countries recognize an urgent need to improve the quality and variety of infrastructure services. Many countries see greater involvement of the private sector within a competitive environment as a tool to improve efficiency – both of investments and operations – since private companies are seen to be better at assessing market needs and managing risks. In political economy terms, privately provided services are also seen as better able to charge market prices. Elimination of subsidies would in turn moderate growth in demand, as well as reduce investment needs and consumption subsidies.

Adequate quantity and reliability of infrastructure are the key factors in the ability of countries to compete in international trade. In fact, globalization of world trade has arisen not only from the liberalization of trade policies but also from major advances in communication, transport and storage technologies. These advances centre on managing logistics – the combination of purchasing, producing, and marketing functions – to achieve cost savings in investing and working capital and responding more rapidly to customer demand.

The exigencies of modern logistics management in developed industrial countries pose similar requirements on developing countries wishing to compete in these markets. Global sourcing has created interwoven networks of international trading and industrial relations, in which businesses in several countries produce different components of the same final product. The ability of developing countries to provide the transport and communications services essential for modern logistics management will increasingly determine their ability to compete for export markets and FDI.

1.5.5 New Dynamism in World Capital Markets: Before World War I, most governments typically did not have adequate resources for undertaking infrastructure activities. Taxes were low, collection abilities were limited and government collection was inhibited by lack of transport and communication facilities. At the same time, capital markets functioned relatively well, particularly in the UK and other European countries. However, the first 50 years of the 20th century were punctuated by a number of political and economic dislocations. The First World War, the Russian Revolution and ensuing Soviet default on Russia's foreign debt, the Wall Street Crash of 1929, the resultant Great Depression in the capitalist world, the bond failures of the 1930s and the Second World War, all occurred in rapid succession within a period of about 30 years. One significant consequence of these dislocations was the collapse of the global capital market which had otherwise developed well in the latter part of the 19th Century and the first decade of the 20th Century. Similarly, the exchange rate regimes also became restrictive, thereby imparting considerable rigidity to the settlement of international payments. When World War II ended, capital markets in most countries except in the US were not functioning well. Consequently, there was little choice but for the public sector to provide the required infrastructure investments throughout most of the second half of the 20th Century. International movements of capital were mediated through institutions such as the World Bank and private international banks.

However, the present decade has seen the re-emergence of both domestic and global capital markets which can be accessed relatively easily by private firms, institutions and governments. Thus, the private sector has now access to various types of resources needed for infrastructure investment. Finally, the problem of adequate access to these services by the poor, and, consequently, the potential of cross-subsidies has become a reality. Whereas

it is clear that there must be a greater degree of private participation in the provision of infrastructure, the government will always retain a critical role both in direct provision in areas not amenable to appropriate financing and user charges, and in regulation in other sectors. Moreover, the government's role in providing subsidies where necessary will also remain. Thus, what is necessary is a transparent framework which promotes synergistic firmness of public-private partnership in infrastructure provision. Apart from this, social dimensions like impact on environment, poverty, health, etc., have also to be assessed and addressed.

1.6. Public-Private Partnerships (PPP)

In the light of commercialization of infrastructure services, the private sector's increasing interest on a commercial basis is only a recent phenomenon, which has emerged in the last five to ten years. Most infrastructure services have some elements of public good in them, in the sense that they are generally publicly available and also exhibit significant positive externalities. To take the simplest example, public lighting by one citizen has no effect on the consumption by another. It is also difficult to exclude anyone from the benefit, and hence to charge for it from those who do benefit. The only way in which such exclusion is possible is to restrict entry into the areas where public lighting is provided, but this is neither practically feasible nor desirable. As a consequence, public lighting is characteristically provided by public authorities and is generally financed by some form of tax revenues. However, in the case of roads, there is greater possibility of pricing and exclusion. The usage of the road by one consumer does not affect the usage by another until a point of congestion is reached. It is only after the road becomes congested that the use of the same road by an additional consumer imposes costs on all others already on the road. Thus, there is some rationale for charging for road usage in order to avoid congestion. In most roads, it is difficult to limit access to only those paying a certain price. Moreover, the use value of a road is enhanced by its connectivity. Attempts to price access to most roads would result in a decline in their use and value. Thus, generally, it is only certain long-distance highways which are built for exclusive use by those who pay for their use. Other examples like transportation, power, water, telecommunications and irrigation may be

taken to show that different segments of infrastructure have different degrees of the characteristically public and private good in their provision.

In the case of most infrastructure services, it is difficult to price them fully to cover all costs. Consequently, it has traditionally been difficult for the private sector to participate in the provision of these services. The greater the element of public good and the difficulty of exclusion and pricing a service, the higher is the likelihood that the service would be provided by the public sector and financed by some form of tax revenues.

Also, infrastructure provision usually involves high up-front costs and long pay-back periods. Investments tend to be typically bulky and lumpy. This has two implications. First, the investor has to have large initial capital. Second, in view of the long pay-back period, he has to be capable of obtaining matching long-term finance. This has traditionally made it difficult for private firms to enter the sector since it neither has adequate access to such large-scale finance, nor does it find it feasible to raise long-term resources in the capital market. Moreover, since infrastructure sectors have to be heavily regulated because of their monopoly characteristics, there is high risk attached to such investments due to uncertainties involved in regulation and pricing.

Finally, there is also the issue of social welfare and externalities. Minimum supply of water, power, sanitation and sewage, and access to transport are all regarded as public services that should be available to all citizens. This is exactly why Public-Private Partnerships have been forged for the development of Infrastructure Services.

Infrastructure projects are generally conceived and implemented on the basis of a meaningful partnership between the public (which includes the governments) and the private sectors. Though the degree of public involvement varies, depending upon the nature and requirements of individual projects, it is essential that the government or its department concerned should take proactive steps in building up a partnership with private project sponsors. In many countries, public services constitute state monopolies or are otherwise subject to special regulation by the government. Where that is the case, the provision of a public service by a private entity typically requires an act of authorization by the appropriate state body. Different expressions are used to define such acts of

authorization. The commonly used expressions include terms such as 'concession', 'franchise', or 'licence'. This research uses the word 'concession' to refer generally to the right given to the Project Company or consortium to construct and operate or only to operate the public infrastructure facility and to charge for its use or for the services it renders (generates).

1.6.1 Approaches to Private Participation: Though there seems to be a consensus among public policy makers and a growing realization for the need for increased public-private participation in infrastructure projects, the issues regarding the approach to be followed for involvement of the private sector remains unresolved. Clearly, there cannot be any single scheme or one-rule-fit-all formula to suit different needs and circumstances. Whatever the approach followed, it will necessarily stem from political commitments and/or pressures, the transition path to be pursued, institutional capabilities, competitive policies, governmental intervention, sector specific features, etc. Based on experimentation over a period of time, countries are pursuing their public-private participation initiative under a variety of schemes.

The paragraphs below discuss the following three main variants: (*i*) public ownership and operation, (*ii*) public ownership and private operation, and (*iii*) private ownership and operation. The appropriateness of a particular variant for a given type of infrastructure is a matter to be considered by the government in view of the national needs and an assessment of the most efficient way in which the particular type of infrastructure may be developed and operated. In a particular sector more than one option may be used, so these options are not mutually exclusive.

1.6.1.1 *Public Ownership and Operation*: The traditional mode of infrastructure provision, with the government being both the owner and the operator of the infrastructure, offered limited or no scope for private sector participation. However, some countries have devised mechanisms for attracting direct private financing or for facilitating the operation of public infrastructure under commercial principles. One way that a government can achieve the desired objective is by establishing a separate legal entity, such as a joint stock company, controlled by the government but managed as an independent commercial enterprise, subject to the same rules and business principles that apply to private companies. Some

countries have a well-established tradition in operating national infrastructure through these types of companies. Opening the capital of such companies to private investment, or making use of such a company's ability to issue bonds or other security may create an opportunity for attracting private investment in infrastructure. Some of these companies have been used as a Special Purpose Vehicle (SPV) for raising private funds for infrastructure investment *via* the project finance mode. In the Indian context, this model is being widely followed in railways, irrigation projects, power and road finance, etc. The Konkan Railway Corporation Ltd. could be cited as a specific example.

Another form of involving private participation in publicly-owned and operated infrastructure may be through the negotiation of service contracts whereby the public operator contracts out specific operations and maintenance activities to the private sector. The host government may also entrust a broad range of operations and maintenance activities to a private entity acting on behalf of the relevant public authority. Under this arrangement, which is sometimes referred to as a 'management contract', the private operator's compensation may be linked to his performance, often through a profit-sharing mechanism, although compensation on the basis of a fixed fee may also be used, particularly where the parties find it difficult to establish mutually acceptable mechanisms to assess the operator's performance.

1.6.1.2 *Public Ownership and Private Operation*: There are various ways in which the entire operation of the public infrastructure may be transferred to private entities. One of the possibilities is to give the private entity, usually for a certain period, the right to use a given infrastructure, to supply the relevant services and to collect the revenue generated by that activity. Such infrastructure may already be in existence, or may have been especially built by the private entity concerned. This combination of public ownership and private operation has the essential features of arrangements, which in some legal systems may be referred to as 'public works concessions' or 'public services concessions'.

Another form of private participation in infrastructure is where a private entity is selected by the host government to operate a facility which has been built by or on behalf of the government, or whose construction has been financed with public funds. Under such an arrangement, the operator assumes the responsibility of operating and maintaining the

infrastructure and he is granted the right to charge for the services he provides. In such a case, the operator is responsible for paying to the government a portion of the revenue generated by the infrastructure, which is used by the government to amortize the construction cost. Such arrangements are referred to in some legal systems as 'lease'.

1.6.1.3 *Private Ownership and Operation*: Under the third option, the private entity not only operates the infrastructure, but also owns the assets related to it. Here, too, there may be substantial differences in the treatment of projects under national laws, for instance, whether the government retains the right to reclaim the title to the infrastructure or to assume the responsibility for its operation and so on.

Where the infrastructure is operated pursuant to a governmental licence, private ownership of physical assets (e.g. telecommunication network) is often separable from the licence to provide the service to the public (e.g. long-distance telephone services). In such cases, the licence can be withdrawn by the government under certain circumstances. Thus, private ownership of the infrastructure may not necessarily entail an indefinite right to provide the service.

While the above three modes can be considered as broad approaches to the private participation in infrastructure, in terms of the actual strategies that are being pursued world over, these can assume any of the following arrangements.

1.6.1.3.1 *Build-Operate-Transfer (BOT)*: Under this approach, promoters under a well-structured agreement with the government for concessions, build, operate and maintain the infrastructure facility. During the life of the concession, promoters collect fees from the users towards the project cost, debt servicing and its operation. At the end of the concession period, the infrastructure asset is transferred back to the government or to the public authority. This approach is often adopted in the development of highways and ports. For example, Madhya Pradesh Tolls Ltd – a joint venture company of Infrastructure Leasing and Financial Services Ltd and the Madhya Pradesh State Industrial Development Corporation – operates a road project under this approach.

1.6.1.3.2 *Build-Own-Operate (BOO):* This is on the lines of BOT except that the infrastructure asset is never transferred to the government. This approach has been

adopted around the world for building power plants, telecom projects and wastewater treatment plants.

1.6.1.3.3 *Build-Own-Operate-Transfer (BOOT):* This is also on the lines of BOT. After the negotiated period of time, the infrastructure asset is transferred to the government or to the private operator. This approach has been used for the development of highways and ports. The proposed Rs. 4,800 crore Elevated Light Rail Transit System (ELRTS) in Bangalore is to be run on BOOT basis over a 30-year concession period.

1.6.1.3.4. *Build-Operate-Lease-Transfer (BOLT):* The "Own Your Wagon" scheme run by Indian Railways is a variant of BOLT under which a set of wagons, purchased by private parties, is leased to Railways on fixed rentals.

1.6.1.3.5 *Lease-Develop-Operate (LDO):* Under this approach, the government/public sector retains ownership of an existing infrastructure facility and receives payments in terms of a lease agreement with the private promoter. This approach has been followed in the development of airport facilities.

1.6.1.3.6 *Rehabilitate-Operate-Transfer (ROT):* Under this approach, the governments/local bodies allow private promoters to rehabilitate and operate a facility during a concession period, after which it is transferred back to governments/local bodies. This approach is followed in urban water and sewage systems.

1.6.1.3.7 *Management contract:* Private promoters assume the responsibility for a full range of investment, operation and maintenance functions with the authority to make day-to-day management decisions under a profit-sharing or fixed-fee arrangement.

1.6.1.3.8 *Service contract*: This approach is more narrowly focused than the management contract. In this approach, the private promoter performs a particular operational or maintenance function for a fee over a specified period of time. Recently, the Chennai Municipal Corporation has engaged a Singapore-based company to clear the garbage in the city. The fee has been fixed based on 'a ton' of garbage removed by the company. It is reported that the per ton garbage removal charges agreed upon is far less as compared to

the expenditure that the Chennai Corporation was incurring on the salaries of their workers and on other overheads.

Table 1 shows investments in Infrastructure sector through the PPP route, as of end of March 2011.

Table 1.1: PPP in numbers (Source: infrastructure.gov.in)

	Completed Projects		Projects under implementation		Total	
	No. of Projects	Cost (Re Cr)	No. of Projects	Cost (Re Cr)	No. of Projects	Cost (Re Cr)
Roads & Highways	196	31577	512	317597	708	349174
Major and Minor Ports	49	36641	109	148028	158	184669
Airports	5	10840	32	44533	37	55373
Railways	5	1166	14	98710	19	99876
Power	14	19019	185	111830	199	130849
Total	432	110907	1533	987260	1965	1098187

Now, it is important to look into the investments required in the infrastructure sector.

1.7. Investments in Infrastructure Sector

While Infrastructure development has always on the top agenda for India, considering the current global economic dynamics as well as domestic growth imperatives, it has emerged as one of the single largest imperative which could seriously compromise the economic growth trajectory.

The Indian Economy is currently going through a challenging phase as GDP growth has slowed down to nearly a decade low in 2012-13. Most projections envisage a slow build up to the 8-10% GDP growth. Infrastructure spend is likely to have a positive spiral effect to the GDP growth and is likely to be one of the main lever to unleash India's economic growth potential.

There have been short term considerations; including growth slowdown coupled with other macroeconomic issues such as high public expenditure, depleting investment and saving levels, worsening current account balance as well as depreciation of the Rupee; that have overshadowed the recent policy directions.

In the second half of the fiscal, the Government has proactively intervened with phased reforms to stabilize the economy. Measures have been taken to reduce subsidies (oil, fertilizers) which would in turn lower the fiscal deficit. The Government has also taken concrete actions to attract foreign direct investment (FDI) and strengthen the rupee.

However, the success of these policy reforms is expected to be gradual. Consistent implementation during the coming years as well as additional reforms to address other macroeconomic imbalances such as current account deficit scenario, prevailing supply side constraints, and inadequate infrastructure investments will dictate the pace of recovery in near term.

In face of a perceivably weak macroeconomic climate, a well-planned economic revival policy is required to steer the Indian Economy back on the growth path. Even though the

long term prospects of the economy look promising, cautious optimism is the tone in the short to medium term.

The focus needs to be back on Infrastructure Development and Financing which remains secular challenge for the economy. One of the key concerns which remain is the adequacy of investment in infrastructure development.

Infrastructure has been one of the key priority areas for the nation and the government has increased infrastructure spend at a rapid pace since the 11th plan. However, the increase in India's GDP in recent years has put tremendous pressure on its inadequate infrastructure. Though there has been a tremendous growth in demand of roads, power, ports etc, India's infrastructure development hasn't been able to keep pace with its economic growth. Addressing the nation's infrastructure needs, especially with today's intense economic pressures, will require government and industry stakeholders to find more efficient and effective ways to finance and deliver capital projects while controlling costs. Our 12th five-year Plan envisages infra-funding of US $ 1 trillion which looks ambitious. For a country like India inclusive growth cannot be over looked which needs to have 7% to 8% GDP growth on a sustained basis at least for a decade as a solution to various economic woes .The large infrastructure spend program as envisaged by the twelfth five year plan emphasizes the need for timely and appropriate means of financing when addressing infrastructure development with finite funding resources.

1.7.1 Overview of Infrastructure Investment in Eleventh Plan

In eleventh plan, a total investment of Rs. 27 lakh crores (eleventh plan – 2011/12 prices) was made towards infrastructure development. This investment at 7.22 percent of GDP (average) represents a significant shift from 5.02 percent of GDP (average) invested during tenth plan. This sharp increase in total infrastructure investment was largely due to the rapid rise in investment by the private sector especially in power and telecommunications. (70% of the private sector investment was made in power and telecommunications.) During eleventh plan, substantial private investment in telecom helped this sector over-achieve whereas a good mix of private and government funding gave oil & gas sector a massive push

resulting in significant overachievement against targets. Power sector also saw a significant investment from private sector. Ports, railways, storage and water supply sectors lagged behind development and didn't meet their investment targets. There may be a greater need to enable private funding for these sectors to meet investment targets for next five year plan.

In first 3 years of eleventh plan, budgetary support constituted 45 per cent of the total infrastructure spending. The debt from Commercial banks, NBFCs, Insurance Companies and the external sources constituted 41 per cent of the funding while the balance 14 per cent was funded through Equity and FDI.

1.7.2 Sources of Funding:

Type	Domestic	External
Equity	Domestic Investors	Foreign Investors
	Public Utilities	Equipment Suppliers
	Dedicated Government Funds	Dedicated Infrastructure Funds
	Institutional Investors	Other International equity Investors
Debt	Domestic Commercial Banks (3-5 year tenor)	International Commercial Banks (7 – 10 year tenor)
	Domestic Term Lending Institutions (7 -10 years)	Export Credit Agencies (7 – 10 years)
	Domestic Bond Markets (7 – 10 years)	International Bond Markets (10 – 30 years)
	Specialised Debt Funds	Multilateral Agencies

1.7.3 Sources of Private Funding

Banks

There has been a rapid growth in bank credit to infrastructure projects with banks contributing to the tune of 21% of the total investment during first 3 years of 11th five year

plan. Most of this funding has been provided by Public Sector banks and in some cases the sectoral prudential caps have almost been reached (especially for power sector) thus constraining any further lending to these sectors. Banks have prudential exposure caps for infrastructure sector lending as a whole as well as for individual sectors.

Non banking financial companies (NBFCs)

Over the eleventh plan period, NBFCs lending increased sharply primarily due to higher demand from power, telecom and roads sectors. Two major NBFCs, PFC and REC together constituted 80 per cent of the lending by NBFCs

Life insurance Companies

Life insurance companies are required to invest at least 15% of their Life Fund in infrastructure and housing. Investment by insurance companies in 2012 has only been 10% of insurance life fund AUM which indicates further potential to utilize insurance companies to fund infrastructure development. Moreover insurance penetration is estimated to continue to rise, with the insurance premium expected to grow from the current approximate 4% of GDP to 6.4% of GDP by the end of the twelfth plan. This will generate further potential for infrastructure funding however it will be subject to management of prudential and regulatory constraints in the sector.

External commercial borrowings (ECB's)

The share of ECB in total infrastructure investments has been recording a decline. This could be a reflection of the way regulatory environment is viewed by the international investors. They are not keen on making long term investments in environments which have regulatory idiosyncrasies. Under-developed financial markets/products may have also contributed to this drop in ECB funding.

Equity

A large part of equity investments relies on foreign investments with domestic investment institutions not showing significant interest in taking equity in Infrastructure projects. The equity investment for the twelfth plan period is estimated to be Rs 4.56 lakh crores

1.7.4 Projected Investment in Twelfth Plan
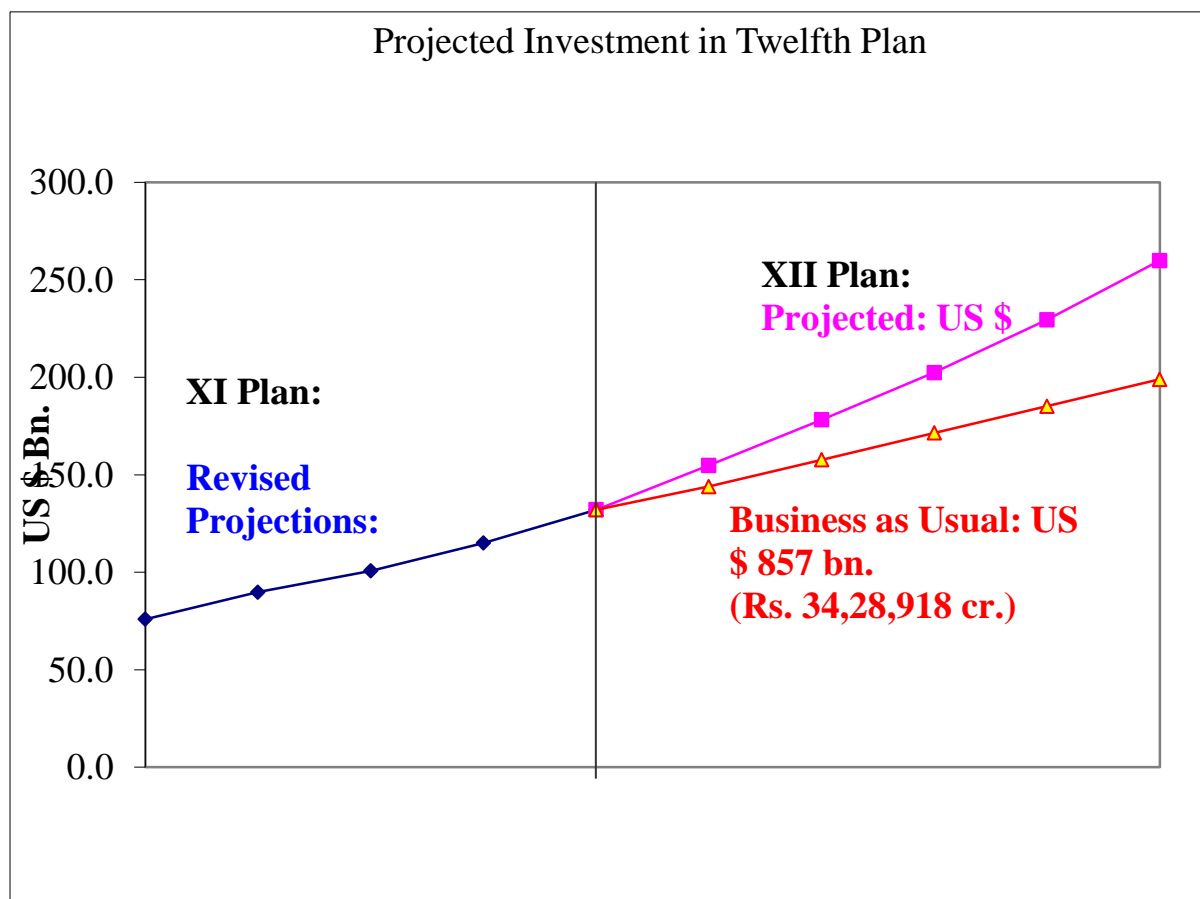
Planning commission is targeting an investment of 51 lakh crores over the duration of the twelfth five year plan which is almost double the amount proposed under the eleventh plan. While the share of public investment is projected to decrease from 62% to a level of 53% in the twelfth plan, the share of private investment is projected to increase from 38% (eleventh plan) to 47% (twelfth plan) of the total investment.

In comparison to eleventh plan, a very significant growth (>100%) in investments (Budgetary & Private) has been projected for Non-Conventional Energy, MRTS, Ports and Storage. All the other sectors are also projected to have an investment growth of >50%. Planning commission is expecting private sector to play a key role in twelfth plan with an overall investment growth of 131%. Private investment is projected to grow in all the infrastructure sectors with Railways, Water Supply, Storage and Ports projected to grow at >200% whereas

investment in other sectors is projected to grow at >100%. Overall private sector investment will be a key to success of infrastructure development under twelfth five year plan.

1.7.5 Funding Gaps in the Twelfth Plan

In twelfth five year plan, planning commission is projecting an investment of Rs.51 lakh crores. About 53% of this is expected to be funded through budgetary support and rest will need to come from private sector funding.

Based on estimated funding flows from various sources and the incremental investment required, twelfth plan will have a huge funding gap and will need to channelize an additional private sector investment of about Rs.6.08 lakh crores over the duration of the plan. This is assuming that budgetary support remains same.

In the given macro-economic environment, this will be huge challenge and won't be possible without the radical reforms.

1.7.6 Challenges in Infrastructure Funding

While there are multiple roadblocks like delays in approvals, land acquisition, and environment clearances etc. impeding the acceleration of the infrastructure development, one of the key one which will be critical for future is the availability of funds.

An important distinction to draw when considering the financial elements of an infrastructure project is that between funding and financing. The funding for a project could be defined as its long-term source of support. In the case of public infrastructure, this may be revenues generated by the project, dedicated tax revenues or general resources of the sponsoring public sector entity. The financing of a project is the means by which the funding is leveraged to provide enough up-front cash to purchase construct or adapt the project. While there may be many creative financing vehicles available, once the funding structure is established, all of these financing vehicles will be "securitizing" the same project economics.

Regulatory & Macro-economic Constraints

Highly regulated investment norms constrain the flow of funding to infrastructure projects.

• NBFCs infrastructure investment growth is limited by their access to bank finance. Tighter prudential limits on bank lending to NBFCs have capped their access to commercial bank funds.

• IRDA has set stringent guidelines towards investment in infrastructure bonds. As per the guidelines, the rating quality of investment bonds should not be less than AA whereas a typical non-recourse infrastructure project is rated BB. Moreover, 75 per cent of all debt investments in an insurance company's portfolio (excluding government and other approved securities) must have AAA rating.

• Statutory restrictions imposed by Government of India on infrastructure: Some key restrictions include minimum credit rating for debt instruments and minimum dividend payment record of seven years for equity. These are difficult conditions for private infrastructure projects to meet as they have been set up recently and do not enjoy high credit rating in the initial years.

• Equity markets are not favourable for financing projects because of uncertainties in the global economy and due to present regulatory requirements limiting exit options, which hinder equity infusion. Moreover, most infrastructure companies have already diluted their equity in public to raise capital and further dilution is not possible due to contractual restrictions imposed on them.

• Sale of unlisted projects is subject to capital gains tax which acts as a disincentive to most equity investors.
There is also a growing perception amongst the equity shareholders that the termination payments in the event of government agency defaults are not adequate in most concession agreements.

• The PFRDA guidelines allows investment in credit risk bearing fixed income instruments(Asset class C).However, at least 75% of the investment in this category is to be made in instruments having an investment grade rating from at least one credit rating agency. The sectoral cap of 75% of the investment having an investment grade rating under Asset class C scheme, has led to Pension Funds missing on the opportunity to invest in infrastructure projects.

• Sovereign credit rating of BBB- limits investments from foreign funds

Under -developed financials markets

• Absence of a well-developed financial system facilitating long term financing has put additional burden on the banks to fill the void. It is risky and limits the lending ability of banks when they engage short term funds for long investment in Infrastructure projects that have a long gestation period (above 5 years). To offset this bank lends on floating rates which is derived on the base rate. Eventually, the project cost may escalate as it becomes susceptible to interest rate fluctuations.

• Lack of derivative market and interest rate derivative market that implies that investors are unable to manage risks efficiently.

• ECB imposes all in cost ceiling that allows access only to highly rated companies. Financial intermediaries, such as banks, FIs, HFCs and NBFCs are not eligible to raise sums through ECB.

• Almost one third of India's saving rate of 37% is directed towards physical assets. Also, financial savings are not properly channelized towards infrastructure projects due to lack of long term savings options in the form of pension and insurance.

• Foreign exchange hedging: Foreign exchange hedging is not available for long tenures especially for a period of more than 8 years and even if they are available, they attract high premiums. Foreign investors are not comfortable betting on India for long tenures

Institutional Constraints

• Most of the life insurance players except LIC have limited non ULIP liabilities that they can deploy in infrastructure. Thus, they face asset liability mismatch in investing long term.

• Public insurance companies are inherently very risk averse. They invest mostly in government securities and in publicly-listed infrastructure companies towards meeting their mandated minimum infrastructure and social sector requirements rather than funding infrastructure projects.

• Most EPC contractors in the country are already working on stretched working capital and debt exposure limits. Moreover, constraints such as labour and manpower shortage, lack of skilled resources, shortage of equipment add to time and cost overruns.

• Low ratings of infrastructure SPV's: The level of ratings achieved by SPV's restricts the flow of foreign funds in the form of debt.

In the light of above constraints, most of the projects look at Bank Funding at least for initial risk capital. We now turn our attention to Bank Lending, which is the focus of the research.

1.8. Bank Finance to Infrastructure Sector: Challenges of Restructuring

In the light of the global meltdown, the twin bane of high interest rates and escalating input costs has begun to slow down the infrastructure development and fewer project proposals are coming up for finance sanctions. Though the Indian banks have sufficient funds to finance infrastructure, the availability of long-term funds remains an issue. Prices of steel, bitumen and steel, which account for up to 40 per cent of construction costs in

infrastructure projects, have escalated increasing the overall project cost. Moreover, there has been a 2-2.5 percentage point increase in interest rates from 9-9.5 per cent some years back to 11.5-12 per cent currently.

However, there are signs that investment in infrastructure is declining. According to initial estimates of the XIIth Plan, in order to sustain GDP growth rate of 9%, the planned investment was Rs. 41, 00,000 crores in infrastructure sector. These estimates are likely to be revised as we see funding gaps in this sector and also down turn in the economy.

To elaborate, infrastructure sector now faces a huge funding gap of hundreds of billions of dollars. Due to lack of other long term sources of capital, notably capital market bonds, insurance and pension funds, commercial banks presently contribute around 20% of total infrastructure investment. In the process, banks have Asset Liability Gaps in funding long duration infrastructure projects. This is made more complex by the fact that projects keep missing the date for commencement of commercial operations (DCCO) on account of delay in land acquisition and various clearances including environmental, coastal regulatory authorities etc. The Government funding is not a solution to fill this gap since it is already struggling to contain a huge fiscal deficit. Consequently, the private sector is finding it difficult to seek finances for infrastructure projects and a slowdown in infrastructure investment looks imminent. The present economic downturn as well as the increase in the overall construction cost has pushed a majority of the private sector infrastructure companies to tight liquidity position.

Some of the companies are on the verge of collapse due to reasons such as aggressive bidding, absence of traffic revenue as projected, delays in land acquisition, hurdles encountered in obtaining environmental clearances & utility shifting and failure to hand over Right of Way (ROW) on time. Other concerns of companies include delays in honouring price variations, escalations, change of scope etc. According to Reserve Bank of India (RBI), capital expenditure in infrastructure for 2011-12 fell sharply from the previous year. The scenario for 2012 -13 looks even more dismal, across all sectors, as evident from Table 1.2.

Table 1.2: Capital Investment in Infrastructure Sector

	2010 -11		2011 -12	
	No. of Projects	Total Investment (Billion Rs.)	No. of Projects	Total Investment (Billion Rs)
Power	107	1840	92	933
Telecom	2	214	1	-
Ports and Airports	2	57	1	25
Total Infrastructure	124	2152	118	1029

Source : Report on Trend and Progress of Banking in India 2011-12,Reserve Bank of India

Restructuring of Loans – Challenges

Though restructuring of loans is considered as a useful support for to make projects financially viable, it is a serious concern in revival of infrastructure sector. Gross non performing advances (GNPA) of all banks rose sharply to 3.6% as at end of September 2012 from 2.9% as of end March 2012. The growth rate of GNPA is at 45.7% as of September 2012. As per the Financial Stability Report, 2012, when an empirical analysis of the asset quality of banks' advances portfolio was conducted by adding back the advances written off during the last five years and (separately) assuming that 15 per cent of restructured accounts slip into impaired category, the resultant ratios exhibited an increasing trend that calls for a closer look at the underlying management of NPAs by banks. In particular, certain sectors like power and airlines saw significant increase in impairments in loan asset quality. The risks faced by banks on their exposure to the power sector are largely due to rising losses and debt levels in state electricity boards (SEBs) and the shortage of fuel availability, besides land acquisition and regulatory issues. Potential pressures on asset quality have intensified with restructuring of bank loans to power sector registering a sharp increase. Meanwhile, the losses of SEBs have also been mounting, adding to the concerns about asset quality in the sector. Asset quality of banks' credit to the airlines industry came under some stress in recent periods, driven largely by the performance of some specific airline

companies. Sharp increases in impairment and restructuring in the sector saw the share of this sector in the aggregate NPAs of the banking system and, total restructured assets rise is disproportionate to its share in banking sector credit. There was significant concentration discernible in distribution of credit to the airline sector as ten banks accounted for almost 86 per cent of total bank credit to this sector.

In the recent years, restructuring of advances has been one of the important recovery channels used by banks to contain delinquencies in loan asset quality. Consequent to the slow down in the domestic economy, banks have actively resorted to restructuring under the scheme of the RBI introduced in August 2008. The scheme enabled banks to retain the status of standard assets even after restructuring. In the process, Corporate Debt Restructuring (CDR) Agency is receiving requests from corporates in a large number. CDR is a tool to lend a hand of assistance to corporate borrowers who are temporarily in financial distress to honour debt obligations, in particular, where the same is caused by circumstances beyond the control of the borrower. Thus, debt restructuring may be required under certain circumstances viz. a cyclical downturn in the economy or in any particular sector, which results in the deterioration in the financial health of borrowers. It may also be warranted in case of emergence of legal or other issues that cause delays, particularly in cases of project implementation. External developments, such as global factors may also result in widespread impact on the financial health of borrowers and may necessitate use of restructuring as a tool to help the borrower tide over difficult circumstances. As seen from Table 3, the amount involved in restructured standard advances went up very steeply form Rs 60379 in 2008-09 to Rs 97834 crores in 2010-11, maintaining a rise of 62 per cent. But in the next year, though the amount involved in restructured standard advances stood at Rs 1,06,859 cores as on March end, 2011., it was limited growth of just 9 per cent. Consequently, the percentage of restructured advances to total standard advances was 2.66 as on March end 2011 as against 2.99 for March end, 2010.

Table 1.3: Restructured Standard Advances

(Rs in Crores)

Item	March end 2009	March end 2010	March end 2011
Total Gross Advances	2793572	3271896	4012079
Standard Assets	2725350	3190080	3717901
Of which restructured	60379	97834	106859
Total Gross NPAs	68222	81816	94088
Total Gross NPAs as % of Total Gross Advances	2.44	2.50	2.35
Restructured Standard Advances as % Total Gross Advances	2.16	2.99	2.66

Source: Report on Trend and Progress of Banking in India, Reserve Bank of India.

Recently, CDR has come under the attention because of the extraordinary rise in the number and volume of bank advances being restructured and also with the rise in the slippage in asset quality In other words, bank recovery of advances from restructured advances is a matter of concern due to delays in implementation of projects. In view of these developments high risk lending as per the recommendations of the Mahapatra Working Group, RBI has asked banks to enhance provisioning in respect of restructured standard assets from 2-0 per cent to 2.75 percent.

In general, it is believed that the RBI guidelines on restructuring have been used to the advantage of both the borrowers and the banks in situations of economic downturns and temporary cash flow problems. However, due to extraordinary rise in the cases referred to and restructured under CDR mechanism during the current and previous fiscal years, questions are being raised as to whether this indicates a general downturn or deficiencies observed in the credit appraisal and monitoring system in banks. To support this, the Report

on Trend and progress of banking 2011-12, Reserve Bank of India states, "The spurt in NPAs could be attributed to slow down prevailing in the domestic economy as well inadequate appraisal and monitoring of credit proposals." This logic may hold good in respect of slippage in restructured advances also, when they become sub-standard or doubtful upon the expiry of the restructuring period. This is evident from the rise in slippage rate in respect of restructured advances moving up approximately from 2.5 percent to 3.0 per cent during the recent past. Thus, deterioration in asset quality of loan assets is a matter of concern which needs to be analysed.

1.9. Challenges Faced by Commercial Banks in Financing Infrastructure

To sum up, infrastructure projects are complex, capital intensive, have long gestation periods and involve multiple players and often pose unique risks and uncertainties to project financiers. Infrastructure projects are characterized by non-recourse or limited recourse financing, i.e. lenders can only be repaid from the revenues generated by the project. This limited recourse characteristic, and the scale and complexity of an infrastructure project makes project financing a tough challenge, especially for bankers who do not possess adequate skills to appraise the complexities involved. The complexities are further compounded by two other factors.

First, a combination of high capital costs and low operating costs implies that initial financing costs constitute a very large proportion of the total costs. Second, infrastructure project financing calls for a complex and varied mix of financial and contractual arrangements amongst multiple parties, including the project sponsors, commercial banks, domestic and international financial institutions (FIs), and government agencies.

Raising adequate equity finance tends to be the most challenging aspect of infrastructure project financing, as equity typically shoulders the greatest level of operational, financial and market risk. However, at present, the limited exit options for investors limit equity financing. Other constraints include a shallow capital market (albeit continuously improving) and weaknesses in corporate governance (primarily minority shareholder protection rights). ***So bank financing of infrastructure is critical to the development of the sector.***

A host of regulatory and institutional problems facing banks constrain their all-out participation in infrastructure projects. A fundamental factor limiting the participation of all types of banks in infrastructure financing relates to regulatory uncertainty, which raises the risk-profile of infrastructure sectors, and makes banks reluctant to finance infrastructure, particularly in the early stages, where project risks are concentrated.

Infrastructure projects require multiple clearances at the centre, state and local levels, resulting in inordinate delays. The time taken to obtain all the requisite approvals for an infrastructure project can vary between as low as 18 months to as long as 5 years. In spite of many states having introduced, on paper at least, 'single window clearance', the fact remains that when most projects apply for approvals at the state-level, these have to go through multiple clearances at various levels. Most infrastructure projects involve also dealing with multiple ministries. One of the key reasons for projects not taking off at the pre-financing stage is that the actions and policies of different ministries are not coordinated and are often at variance with each other.

Problems in contract negotiations and delays in the award of contracts are pervasive across all infrastructure sectors. Limited capacity within government to execute PPPs in infrastructure is a key constraint. Both the central government and the states are aiming to use PPPs more extensively to help meet gaps in the provision of basic services in the country. But PPPs represent a claim on public resources that needs to be understood and assessed. They are often complex transactions, needing a clear specification of the services to be provided and an understanding of the way risks are allocated between the public and private sectors. Their long-term nature demands that the government has to develop and manage a relationship with the private providers to overcome the unexpected bottlenecks that over time can disrupt even the well-designed contracts.

1.10. Identification of the Problem and the Scope of Research

It is evident from the discussions above that there is a substantial gap between the investments required in the infrastructure sector and the finances available. It is also clear that in the light of the changing financial system in India, where Development Financial Institutions (DFIs) do not play a significant role any longer, commercial banks are required to

lend to projects of longer duration. In the light of constraints discussed above, the Indian banks, as financers of these projects need to critically scrutinize and evaluate the proposals in terms of all structural features and determine the viability of each project for financing.

The present research will focus on elaborating all stakeholder issues so that a holistic understanding of restructuring challenges in this sector is developed. The research will focus on the rising cost of equity for promoters in the light of high debt equity ratio employed in these projects, making it more difficult for promoters to bring in upfront equity; structural, appraisal and follow up issues from the perspective of Indian banks; regulatory and environmental constraints and the Governments intervention and finally the Debt restructuring mechanism and its effectiveness.

In the next chapter, conceptual framework of project finance is built through literature survey.

Chapter 2

Project Finance and Appraisal: Concepts and Review of Literature

2.1 Definition of Project Finance

The literature survey differentiates between the traditional corporate financing structure and the modern infrastructure projects financing.

To elaborate, *in the traditional form of financing*, as defined by Mehta (1977), Griffin (1995), Pandey (2002) and Chandra (2005) and commonly known as corporate financing or the balance sheet financing, although the financing is done for a project, the lender looks at the cash flows and assets of the whole company in order to gauge its ability to service the debt and provide security. However, in *modern project financing*, lenders base their credit appraisals on the projected revenues from the operation of the facility, and also on its assets including any revenue-producing contracts and other potential cash flows as collateral for the debt, rather than on the general assets or the credit (credibility) of the sponsor of the project. In this regard, studies by Adelson (1970), Quirin (1977), McConnell and Muscarella (1985) are important. They termed these (projects) as tactical decisions which demand different perspectives both from the investors and the lenders as they are driven by contractual structures and are able to encash future opportunities. Similar definitions have been given by Finnerty (1996), Nevitt and Fabozzi (2000), Hoffman (2001), Esty and Sesia (2005). Infrastructure in India, as gleaned from the studies by Ghemawat (2000) and Mehta (2001), follows the project financing method. These definitions of project finance highlight some of the basic characteristics of the project financing method such as: (*i*) the **Creation of a Separate Entity,** popularly known as Special Purpose Entity or Special Purpose Vehicle (SPE/SPV). The SPV has a defined objective and definite life; (*ii*) the **Equity Holding Pattern** which may involve 3 or 4 equity sponsors; (*iii*) the **Non-Recourse Debt**, which implies that the debt component provided by lenders is on non-recourse basis and the lenders have no claim on the equity of sponsors for the repayment of the debt but fully rely on the project's cash flows for the debt servicing, *(iv)* **High Leverage,** and the complex (*v*) **Contractual Structure.**

As evident from literature survey, Project Finance is a well-established technique for large capital intensive projects. Project Financing involves raising of funds to finance an economically separable capital investment project in which the providers of funds look primarily to the cash flow from the project as the source of funds to service their loans and provide the returns to the equity investors.

In case of capital intensive infrastructure projects, it involves financing of projects on standalone basis often on non-recourse or limited recourse basis (no or limited support of sponsors/promoters balance sheet)and is suitable for great variety of capital investments including roads, pipelines, refineries, electric power generating facilities, hydroelectric projects, mines, mineral processing etc.

As per Basel II guidelines (since adopted by RBI), the corporate asset class includes, but is not limited to, four separate subclasses of Specialised lending (SL). The four sub-classes of specialised lending are project finance (PF), object finance (OF); commodities finance (CF) and income producing real estate (IPRE).

The RBI guidelines define Project Finance as:

(i) Lender is usually paid solely or almost exclusively out of the money generated by the contracts for the facility's output: example: electricity sold by a power plant.

(ii) Borrower usually an SPE not permitted to perform any function other than developing, owning and operating the installation

(iii) Consequently project debt repayment depends on project cash flow and collateral value of project assets

As Basel II as well as RBI guidelines categorizes project finance under specialized Lending, which calls for a different supervisory slotting criteria and risk weights, the entire project finance portfolio needs to be understood in the context of size, new sectors, risks, regulatory aspects etc.

Put simply, for a lending banker, project financing means the process of appraising the commercial/economic viability of the project, identifying risks and mitigations for the project, tying up of funds through equity and long term loans for implementing the project and monitoring the implementation, operation and debt servicing of the project.

Project Financing can be arranged when a particular facility or a related set of assets is capable of operating profitably as an independent economic unit. The sponsor of such unit may find it advantageous to form a new legal entity to construct, own and operate the project. If sufficient profit is predicted, the project company can finance construction of the project on a *project basis,* which involves issuance of equity securities (generally to the sponsors of the project) and debt securities that are designed to be self-liquidating in nature from the revenues derived from project operations.

Although project financing will have certain common features, financing on a project basis necessarily involves tailoring the financial package to the circumstances of certain specific projects. Expert financial engineering (meaning creating a structure of contract and documents and aligning debt equity ratio to repayment profiles) is often just as critical to the success of large project as are the traditional forms of engineering.

Project financing typically includes the following basic features:

(i) An agreement by financially responsible parties to complete the project and towards that end, make available all funds to the project to achieve completion.

(ii) An agreement by financially responsible parties (typically taking the contract for the purchase of project output) that when project completion occurs and operations commence, the project will have sufficient cash flow to enable to meet all its operating expenses and debt service requirements. These agreements when monetized (if project cash flows face distress) are the second line of defense even if the project fails to perform.

(iii) Assurances by financially responsible parties that in the event of disruption in operations and if funds are required to restore the project to operating conditions, the necessary funds will be made available through insurance recoveries , advanced against future deliveries, or some other means.

Project Financing should be distinguished from conventional direct financing for a project or what may be termed as financing on a corporate's general credit or balance sheet strength (Corporate Finance/Loan). In terms of conventional direct financing to corporate undertaking projects on their existing balance sheet strength, lenders look to the corporate's entire existing asset portfolio to generate the cash flow to service their loans.

The assets and their financing are integrated into the corporate entire asset portfolio to service their loans. Therefore, the assets and their financing are integrated into the firm's assets and liability portfolio.

The critical distinguishing feature of a project financing is that project is a distinct legal entity particularly in the case of infrastructure sector. Project assets, contracts and cash flows are segregated to a substantial degree from the sponsoring entity. The financial structure is designed to allocate returns and risks more efficiently than a conventional financing structure. In a project financing deal, the sponsors may provide, at most, limited recourse to the cash flows from their other assets that are not part of the project. Also they typically mortgage/hypothecate/pledge the project assets but none of their other assets, to secure project loans. This may not be true in respect of non-infrastructure projects, where the finance may be raised under the same balance sheet for fresh Greenfield or brownfield project (e. g, expansion of a steel plant capacity).

For instance, if a sponsor/promoter is implementing four road projects, there would be four new corporate entities of the sponsor/promoter i. e, four special purpose vehicles (SPV). On the other hand, if a corporate manufacturing cement decides to implement a brownfield project for capacity expansion even at a different location, the new project assets may be taken in the existing balance sheet instead of forming a new corporate entity/SPV of the sponsor/promoter.

The term project financing is widely misused and perhaps even more widely misunderstood. It is important to clarify what the term Project Finance does not mean. Project Financing is not a means to raising funds to finance a project which is so weak economically that it may not be able to service its debt or provide an acceptable rate of return to its equity investors.

To conclude, as a banker one must appreciate that project finance is an attractive financing alternative enabling project sponsors to shed risks to the banks or capital debt markets. To the owner or parent entity, the non-recourse aspect is prized since it allows that company or group to go on to develop other projects – to become a serial developer.

Knowledge of the risks and the structures of project finance to handle risk are paramount in achieving the best deal for both sides. A project financing deal requires careful financial

engineering to allocate the risks and rewards among the involved parties in a manner that is mutually acceptable.

This calls for a complete paradigm shift in Project Appraisal skills of the bankers from being a collateral/security driven appraisal to cash flow and documentation based assessment. Project Finance is predicated on the necessity to organize each risk class, to assist in identification, as a means to structure the many solutions that could be deployed to address each risk facet. Risk in project Finance is a matter of heavy negotiation and trade off. Risk allocation is not just about allocating risk to "the party best able to bear it". It is negotiated as far away as possible and mitigated in such a manner that it cannot spring back.

Project Finance, as is evidently clear from the above discussion, finds itself as a preferred financing technique for infrastructure assets.

2.2 The Project Concept

Project financing is a financing option granted by the lenders to the project developers, exercisable when the project entity demonstrates that it can generate cash flows in accordance with long-term cash flow forecasts. Upon exercise of the option, the entity's parent(s) or sponsor(s) balance sheet may or may not be *(more often, may not be, in the case of infrastructure projects)* available for debt service. The assets, rights, and interests of the project entity are usually structured into a special-purpose project vehicle (SPV) and are legally secured to the lenders.

Prior to undertaking to fund an infrastructure or non-infrastructure project, the Bank has to ascertain

- That the project demonstrates that it can generate returns/cash flows in accordance with long-term cash flow forecasts for servicing of debt.
- Availability of financial, collateral (project or other assets) or contractual resources to repay the funding (if the project fails to be completed and roll up the capitalized interest during construction into financing).
- Availability of other credit enhancements/comfort

The Bank has to put in place appropriate appraisal architecture designed to ascertain whether the project demonstrates returns/cash flow generation.

There may be instances of the project already generating sufficient cash flows – such as in a privatization or acquisition – in which case the appraisal architecture may be redundant or less rigorous at some stage of the appraisal. However, the principle remains the same – dependence on the entity's returns/cash flows as the primary repayment source supported by holding of the project assets/contractual resources as collateral and other credit enhancements/comfort.

2.3 Project Finance Characteristics

Off-balance-sheet finance was a common objective of early project financings where deferred income (as in a production payment with advance from buyers) or lease obligations were not recorded on the balance sheet as senior debt. International accounting standards have now moved just about every obligation and indebtedness onto the balance sheet, if not formally then requiring a statement in the notes to the company's accounts. Not every country has yet moved to adopt these standards. The expectation however is that they will (have to) over the next few years.

So what can be done to get the deal off-balance-sheet? There is no special project finance tool available.

2.3.1 Deconsolidation

The preponderance of joint ventures and consortia of developers undertaking project developments makes it relatively easy to hold an individual developer's interest to 50 per cent or less in the SPV, thereby enabling the project debt to be deconsolidated. Only the investment in the SPV is booked on the individual developer's balance sheet.

Two equal equity stakeholders can agree together to deconsolidate above or behind the SPV or to enter into arrangements to fund each other yet keep their interests at 50:50 (or a lower percentage) to achieve deconsolidation of the debt off each balance sheet.

Deconsolidation may also be motivated by complementary strengths in the sector like a joint venture between an overseas developer (funds and technology), and a domestic developer (funds, familiarity with local environment and experience in similar project).

2.3.2 Portfolio spinoff

Some developers spin off portfolios of project interests to lower their holdings (to 50 per cent or below). This often happens at a stage when the project has been completed and revenue/cash flow is on stream as per projection and thus the project risk is largely mitigated. The reduction in stake **unlocks** capital at a premium which the developer then invests in new projects. These portfolio entities are designed to stand on their own (balance sheet) full to the brim with project financings, with the objective of keeping that debt pool off the parent's accounts and therefore not affecting the parent company's rating. Mission is to roll out one project after another and thereby use project financing as an overt development tool.

2.3.3 Non-recourse

`Non-recourse` lending is relevant to SPV mode of project implementation by the developer. One needs to be clear about what `non-recourse' means. To the project lender, this means that repayments originate from the project's cash flows/collaterals and not the cash flows/collaterals of sponsor/promoter companies or any other source. But the project lender would not want the sponsor/promoter to withdraw its financial/management/project capabilities from the deal and will seek contractual recourse to ensure continuation of that commitment (for instance commitment to infuse additional equity to meet cost escalation or obtaining approvals) and ownership through suitable covenants with provision for covenant testing.

A sponsor would seek to take full advantage of the non-recourse option to insulate its balance sheet at the launch of the project finance phase. The option is able to be exercised once a cash flow demonstration test has been satisfied/vetted *(completion test).*

Pre-completion – with cash outflows for construction and start-up/commissioning – has to be the structured and funded somehow. Inevitably the financier requires financial support either fully to a creditworthy sponsor or financial guarantor or to the turnkey construction contract (TCC). Completion, risk, is often mitigated by all manner of financial props, contingent supports, warranties, bonding, and the like. Rarely will the project financier allow the option (to non-recourse) to be granted prior to completion.

2.3.4 Completion test and option conditions

The option conditions embedded in the completion test are often the most negotiated facet of a project-finance transaction.

Some sponsors present a higher capital expenditure (capex) requirement and a longer development/debt servicing timetable, knowing full well that they can better both parameters (with the project built below the budget and ahead of time). This is done for the purpose of having some flexibility in case of unexpected hurdles during implementation stage.

2.3.5 Limited recourse

Many financial limitations may be agreed within a project financing whereby recourse is constrained in three main ways, or any combination of these:

1 *Time* – recourse stops after an agreed fall-out date;
2 *Amount* – recourse has a ceiling or cap in money terms; or
3 *Event* – where satisfaction of some event or trigger is required, (perhaps exceeding a financial hurdle in some way).

Although project financing may move to non-recourse post-completion, three instances remain which may spring recourse back to the original sponsor/parent.

These are:

1. *Fraud*, where information has been manipulated;
2. *Misrepresentation*, where incorrect or inadequate, disclosure or statements have been made or omitted; and
3. *Wilful* negligence, where any ordinary concept of diligence and stewardship has been deliberately abandoned or worse.

2.4 Advantage for a sponsor/promoter in non-recourse model

2.4.1 Capital shortage

Entrepreneurs, small companies, and cash-starved governments can see dozens of high-leverage project financings. Other developers seek to optimize this success by project financing.

Many new projects exceed the capital resources of the developer(s), or the number of projects being developed concurrently can stretch the budget of even the biggest corporate as it happens now and then in the case of infrastructure, real estate etc.). Very large (like mega and ultra-mega power projects) projects can be outside the reach of even the largest corporates or even governments and are ready targets for structuring a project-finance deal. A few good examples of mega/ultra mega projects are the ultra-mega power projects (UMPP), petroleum/hydrocarbon refinery, mobile telephony and copper/aluminum refinery.

In recent years, the slowdown in FDI/PEI inflow (even the pre agreed inflows) following the global downturn and India's rating has resulted in implementation of some projects getting delayed due to capital constraints.

2.4.2 Risk transfer and sharing

The ability to transfer risk to the financier is at the heart of the project-finance process. Companies with significant market risk, cyclical operating conditions, or price challenges eagerly isolate those risks, on the financiers' behalf, into the SPV.

Even large companies facing political risks will use a project financier as a way to get political-risk cover on the debt side of the project. Roughly half of all project financings are to secure political risk coverage.

Project Finance is perhaps the only structure which helps in allocating risks to the parties best placed to absorb this risk on a suitable risk return trade off.

SPV model (Deal sequestration)

A sponsor/promoter may elect to isolate a project into an SPV or equivalent for illustrative reasons as under:

(i) The sponsor/promoter may like to keep the new project remote from the group's other businesses to protect the latter. The sponsor/promoter may seek to ensure that in the event of project failure, the debt does not bounce back onto its balance sheet.

(ii) The lenders may wish to protect the new project from other businesses of the group. In this way, a well-structured project finance deal may be much more secure and bullet proof than an amorphous group credit based transaction.

(iii) In case of an infrastructure project being implemented under a concessional agreement (say a road project for which the sponsor/promoter has been successful in the bid submitted to NHAI), the concessionaire NHAI may insist on project being executed by as SPV of the sponsor/promoter.

(iv) A project is being implemented with equity participation by an overseas JV partner (say a pharmaceutical project) with the latter desiring for a separate entity.

(v) A diversification/backward or forward integration project is proposed to be implemented by the sponsor/promoter as a separate entity.

(vi) Even in the case of an expansion/diversification project being implemented under an existing corporate structure, the lenders of the existing or the brownfield project may desire to ring fence the cash flows/security though under the same balance sheet.

(vii)   Small companies or weak credits may have a new project which is substantially better than themselves. The new project or acquisition may be able to attract much more funding on better terms and conditions than the weak sponsor.

(viii)   Project supports from take-or-pay contracts, strong off take, or through investment/linkage to a strong consumer may be more bankable than anything the sponsor may be able to achieve.

(ix) Companies with tough labour conditions will establish a separate entity for a new project to establish new workplace agreements. In this way they seek to shed existing labour inefficiencies.

(x) The rating of the sponsor/promoter may be superior to the proposed project.

(xi) As a self-sustaining project SPV, the project may command a superior rating than the sponsor/promoter.

(xii)   The lenders' consortium for the existing business and new project may be different sets of banks/institutions.

2.4.4 Better returns

Many regard project finance as a tool to achieve high gearing/leverage and long repayment terms. Therefore, it will automatically enhance the rate of return calculations, however calculated. In most instances the return should be able to be doubled – always given that adequate cash flow coverage of debt service (via the DSCR) exists.

Many governments like to use IRR thresholds to curb windfall/excess profits, (like the power sector in India) especially in privatizations or for granting new concession contracts and, of course, to keep the returns to the private sector at politically acceptable/defensible levels.

2.4.5 Consortium control

Large projects are often undertaken by a consortium of entities, such as participants who provide:

- land;
- technology;
- operations management;
- construction;
- financial clout;
- local connections;
- transportation;
- supply/resources;
- offtake/market;
- Government or development capital.

Due to the highly structured nature of a project financing, a horizontal as well as vertical discipline is naturally achieved. Each consortium member is, in a sense, protected from, yet supported by the other. Project financing might may be particularly useful where significant conflicts of interest exist with some consortium participants.

2.4.6 Covenant management

Project financing can be engineered to get around outside constraints such as:

- Borrowing or balance sheet limitations imposed by other group lenders;

- Security restriction are in place by lenders

- Regulator limits on activities or returns.

This can be achieved in a manner which does not threaten the original intent because the new enterprise is being launched on the premise of standing alone and apart.

2.4.7 Flexibility

A well-structured project financing can be highly flexible. Banks may be able to achieve this through automatic resetting devices based on the project's performance or the sponsor's expansionist desired (while still leaning on the cash flows-first principle).

2.4.8 Workouts

The flipside to flexibility is the attitude of project financiers to a workout. In conventional balance-sheet lending, the task is to reshape the entity, sell this, merge that, and sack so many. Banks structure a project finance with an eye to its future cash flow potential anyway and always recognized that an exit by foreclosure or sale was unlikely to be sufficient to pay off the debt. Bankers are therefore more likely to work to preserve the enterprise, including recapitalizing it (by providing `new' loans) and re-shaping the repayment profile. The project-finance legal structure allows the banks to step-in to the shoes of the project to take the next steps to redressing the cash flow difficulties. As a last resort the banks will still try to bring in a new player to own, operate, and reinvigorate the venture, rather than move to an out-right sale.

2.4.9 Privacy

If matters surrounding the deal are commercially sensitive, then the quarantining of the deal and deal information inside tight confidentiality restrictions is another reason to select project financing. If suitably warned, many banks can be excellent in this area. However, some national business cultures are `leaky'. A private placement document is far from private since numerous `hands' have viewed and had input to the offering memorandum or placement document.

2.4.10 Project validation

The project finance process involves a high level of due diligence and credit intensity. With the banker taking all the risks so structured without an equity return, it is natural to see extensive stress testing of the `downside' and `breakeven' cases. It is always raining on a banker's parade.

2.5 Disadvantages for a sponsor

2.5.1 Documentation

Because of the highly structured nature in many project deals – the natural result of risk allocation – the complexity and often cumbersome documentation is seen as the primary barrier to project finance.

2.5.2 Extra cost

Large companies frown on the perceived extra cost and complexity of project financing, preferring to use the collective corporate capital pool for the necessary development monies. Some company treasurers also fear the reverse leverage that might spring from increased interest rates in a highly-geared structure while others fear the controls of the classic project finance covenants that banks, especially, seek.

2.5.3 Long period of designing, structuring, tie up and implementation

Project financing is difficult to execute quickly. The various structuring stages takes approximately nine months to one year if the deal is already well prepared and presented. The shortest is around three months where a small group of experienced players are dealing with a wholly (pre)packaged, simple, straightforward deal with known and trusted developers.

2.5.4 Lender control

The project finance structure is designed to control the risks. The tight packaging of project finance structures and documentation can create the appearance that the bankers are running the business. Inevitably, this spills over into controls over operations; special reporting; regular independent engineering reviews and (re)certification; constraints on

security, permission to do anything new; regular waiver/compliance `negotiations'; and liaising with bank syndicate members.

2.5.5 Higher insurance costs and legal bills

Insurances are seen as a secondary structure in many aspects of project finance. While expensive, it may be the only backstop available for many risks.

Active participation in drafting and document scope setting is actually welcomed by smart project finance lawyers who enjoy the change from a plain-vanilla corporate deal.

2.6 Stages in Project Financing

There are three stages in project finance for new development. For an existing enterprise, the first two have already passed.

(i) Construction when the funding is required for capital expenditures, fees, and services. During this stage, interest is usually capitalized into the loan.

(ii) Commissioning / completion when the project is starting up and testing the option conditions to release recourse to the sponsor group's balance sheet or the turnkey contract's transition to an operating enterprise.

(iii) Project operation phase where the debt parties can expect repayment from the project's cashflows (primarily) backed up by a collateral package of rights and interests.

Early input on the preferred project-finance structure can add greatly to the ease of structuring and can often achieve better overall terms and conditions. Structuring ideas should be drawn into the project early on by inclusion of financial advisers by the borrowers.

2.6 Approach of banks

Adopting a strategy of approaching the debt markets with a project financing is not especially different to other financings, with exception of the time it takes. The highly structural requirements needs more time to absorb and concomitantly it opens more avenues of questions and due diligence.

Banks have their own teams accustomed to this lengthy process and capable of acting as the internal deal `champion' to shepherd the credit-committee application through the various internal approval chains, culminating with credit committee approval.

Another feature of the banking market is a wide spread of skills and appetite for different regions.

As a lead arranger, Bank has in place in-house specialists and engineers and external consulting / retainer personnel. These have wide experience and can be very helpful in communicating industry or technical risk aspects which can intimidate the non-technical, non-specialist banker. However, one must be prepared for full scrutiny of all project aspects. It is useful to assemble extra copies of key reports which can be dispatched on an as-requested basis. The lead banks' representatives may be installed for some days at the data room / project secretariat while they do the due diligence directly or set the scope of the independent reviews. Co-operation in setting the scope of the independent reviews may stop the inevitable `reinventing the wheel' which crops up when any newcomer tries to grasp the many facets that have been studied or are now proposed.

A visit to the site, country, or a similar project can be an excellent investment since the qualities and personalities of the various players can be assessed in a more informal way. The deal champion is being armed with facts, a track record, and a better vision of the project development itself and best of all would be able to meet the intended project management team (not just the feasibility engineers). Some corporates have annual bankers' presentations which try to achieve a similar end.

There should not be a mysterious air surrounding a bank's approval or the ratings process. If there is, then that's a risk.

The banks need the same information as the company and in the same order. A common approach is to use the executive summary of the feasibility study. However, that instantly pitches the screening process at the engineers. Ultimately the project description will actually form a very small part of the credit committee approval memorandum. Having said this, one needs to know if the bank's engineers have credit approval authority (or veto).

A banker / team of two or three people can devote around two to three weeks of work on any credit review.

2.7 Issues in Appraisal – Laying the foundation

2.7.1 Increase in size of projects:

In the past decade or so, banks have had to gear up to deal with huge increase in project size/cost. Some of the reasons are:

(i) Infrastructure projects involve capital outlay that is intrinsically large in size. The demand/gap in the country's infrastructure framework and the urgent need to meet the demand/gap arising from growth in the industry and services sector capacities has led to launch of large size projects like (i) mega and ultra-mega power projects, (ii) road projects, (iii) modernization of major airports, (iv) development of non major ports etc. Initially coal based power projects for 100 MW were taken up about a decade back under IPP. Today power projects of 1000 mw and higher have become common. In the case of roads, many road stretches being offered for bidding by NHAI for four laning & six laning are in the range of 100 km and above.

(ii) In the non-infrastructure sector also, growth phase of the Indian economy and globalisation has provided opportunities for large additional capacities in sectors like steel, cement, automobile etc.

(iii) Sponsors/promoters take up larger expansion/integration projects after gaining experience in executing smaller projects.

(iv) Growth phase of the Indian economy and globalization resulted in sponsors/promoters pitching for over ambitious projects for expansion/integration.

(v) Composite projects are preferred in some sectors like sugar plant with cogeneration of power and distillery.

(vi) In case of textile mills, integrated mills are set up instead of a spinning or weaving unit on a standalone basis.

(vii) Due to globalization, markets has widened geographically and has created need for higher scale of production and also achieve economy of scale in order to compete in pricing and quality.

With increase in size of projects, some Banks have developed and expanded the project appraisal, syndication and monitoring skills and infrastructure to handle large size projects. Apart from the soft skills and infrastructure required as above, Banks have to address other aspects also, like a few mentioned below:

(i)   Capital requirement as long as the Bank is holding on to the asset.

(ii)   Provisioning requirement for standard asset and also in case of restructured debt/slippage.

(iii)   Concentration risk arising from sector behavior and higher exposure per project wherever the project debt is syndicated and/or underwritten.

(iv)   In view of the capital and provisioning requirements and competition for quality assets, there is a need to maximize the revenue streams per account.

(v)   Monitoring mechanisms required during and post implementation stages, a challenge with increasing size and complexity of the projects.

(vi)   Maintain and depend on panel of experts in various areas like Sector consultants, Lenders' Independent Engineer, Security/Facility Agent, Chartered Accountant, Chartered Engineer/valuer and Legal Counsel.

2.7.2 Security – Asset or Project or cashflow

In event of the Bank deciding to enforce the security, in a conventional manufacturing unit, (i) the business unit as a whole can be sold or (ii) the assets can be stripped and sold like land or specific machinery. In the case of large or some specific projects, it may not be possible to strip the asset for selling.

A good example is an annuity or toll based road project under concession agreement with NHAI. Here, the road cannot be charged or sold as an asset. Only the rights under the concession agreement can be sold to another concessionaire as permitted under substitution agreement signed with NHAI. The same would apply to a port project. The project lenders would have recourse to cash flow/TRA and rights under the substitution agreement.

Another type of example is a large capex project in infrastructure sector like a 2000 mw power plant or in non-infrastructure like (i) flat steel, (ii) bauxite projects. The outlay in such projects will be very high.

In the case of a gas pipeline project, the individual pipes cannot be uprooted and sold piecemeal. The project as a whole will have to be sold.

In such instances of large size/mega size projects, it may be difficult for the Bank to find a financially resourceful buyer without a steep discount. Larger the project, less are the chances of sale by asset stripping.

In the next chapter, a structure for appraisal of Infrastructure projects by banks is laid down. This becomes important as we have established in this chapter that Infrastructure by banks is funded through Project Finance which is different from traditional corporate finance done by the banks.

Chapter 3

APPRAISAL: *Contractual parties, Security and Documentation*

3.1 Introduction

The challenge before lenders of infrastructure and non-infrastructure projects lies in evaluating the viability and bankability of a project by following proper appraisal process. The key to successful project appraisal is in ensuring that the project has passed through stringent appraisal process and risk evaluation. The project lender should not feel that the decision to lend is merely based on "gut" feeling or on the strength of appraisal carried out by a renowned external domain expert or a syndication arranger/lead bank. All projects in various infrastructure and non-infrastructure sectors will have certain common features and will also be unique in certain aspects. The same set of appraisal methodology, risk profile and benchmark ratios/parameters will not apply to all projects. Of course it is a known fact that lenders world over are on a learning curve and Indian banks and financial institutions are no exception*.*

3.2 Key Project Parties

As the project moves from conceptual and developmental stages to financing and thereafter to implementation/construction and finally to operations, several project parties get involved with the project. It is therefore important for the credit officer to identify these parties and the contractual framework binding these parties.

3.2.1 Project Sponsors

The project sponsors (also referred as promoters or developer or group and who normally hail from established business groups) are responsible for converting a concept into a project and have a role in setting up a project vehicle *(existing corporate or an SPV),* identifying and recruiting the right managerial talent to implement and run the project, providing a clear mandate to such management on their expectations, and finally

subscribing to a portion of equity in the project vehicle. Implementation of a project involves mobilization of various resources by the sponsors including finance and management as mentioned above and also EPC contractors, legal experts, sector domain experts etc. The mobilization strength of the sponsors is critical as the management team put up by them should have the relevant experience in the project area and the sponsors can also infuse additional equity if in case the project gets into cost and time escalation.

3.2.2 Project vehicle

Infrastructure projects mostly involve a Special Purpose Vehicle (SPV). The SPV is responsible for evolving and delivering a bankable project, implementing the project and thereafter operating it in a manner that is financially viable. It selects and appoints all the project contractors, negotiates and executes the contracts, raises the financing, supervises construction and commissioning and operates the project either directly or through an Operations and Maintenance (O & M) Contractor. Non infrastructure projects may involve SPV or could be an extension of an existing capacity or integration etc.

3.2.3 Project Lenders

Project lenders provide debt to finance the construction of the project. The lenders could be banks and institutions on the one side and lenders/investors in securities like FCCB, preference shares, bonds etc. on the other side. The latter type of lenders/investors are important as they come in with convertible securities, long term mezzanine debt etc. and supplement the equity/loan brought in by the sponsors/promoters for constituting the project margin.

Typically, a consortium of project lenders led by a "Lead Bank" like our Bank appraises the viability and bankability of a project based on project cost and corresponding means of finance. The consortium/lead bank disburses debt and performs a monitoring role during the construction phase and on commissioning, monitors the performance and operation of the project till all debt is repaid. Project lenders are secured by project assets and do not normally interfere in the day to day operations of the SPV. However, under conditions of default, the project lenders' enforcement rights are triggered under the covenants of events

of default. The lenders possess the rights to recourse to legal action for recall the dues and enforcement of security by foreclosure of mortgage, sale of shares pledged etc.

3.2.4 Substitution agreement

Lenders normally sign a "Substitution agreement" with the sponsors and SPV, as a part of loan documents which gives them step-in rights like conversion of debt into equity, pledge of sponsors' equity, appointment of nominee director/special monitor and change of management structure. The lenders can then resell the equity to a third party which can carry forward the project profitably. The substitution agreement is specialty of infrastructure projects that are implemented under a concession agreement like roads and ports and will require the approval of the party granting the concession like NHAI and port authority. In non-infrastructure sector, change of management has been effected in some cased under the aegis of CDR forum involving debt restructuring.

Contractual parties involved in a project:

3.2.5 Engineering Procurement and Construction (EPC) Contractor

Typically the EPC contractor designs the project, procures all the engineering skills and equipment to construct the project, erects all the project facilities, ensures that test and trial runs are completed and finally commissions the project, all on a "Fixed Time Fixed Price" basis. The EPC contractor's key objective is to deliver a project, as per predefined specifications within a certain cost and time frame. It also provides performance guarantees to the SPV. It may choose to subcontract certain portions of the assignment to other contractors but such subcontracting does not relieve it from its sole responsibility of delivering a constructed project to the SPV.

3.2.6 Operations and Maintenance (O & M) Contractor

As the name indicates, the O & M contractor is responsible for operating and maintaining the plant in line with industry best practices. Performance parameters that need to be achieved during operations are predefined in an O & M contract and the O &M contractor provides managerial skills and operations experience to achieve and surpass the agreed parameters.

3.2.7 Government

The Government is a key project party especially in case of infrastructure projects implemented under PPP basis. It provides a concession to the SPV to set up the project and ensure that a proper legislative and regulatory framework exists that allows the concerned SPV to compete on a level playing field along with existing, possibly Government owned entities, in the same field. In some cases, like the electricity generation sector, state government have counter guaranteed the performance of off take obligations of the State Electricity Board's (SEB) and in certain cases the central government has counter guaranteed the performance of the state government.

3.2.8 Suppliers

The suppliers are critical in the project development stage. Usually the EPC contractor ties up with the suppliers of material prior to the construction phase, in a power project, suppliers of raw material for power production are critical. Supply of coal for thermal power plants has to be tied with Coal Corporation, and then if the power plant is not located on the pithead, transportation of coal also needs to be arranged. There are examples of many power plants which have defaulted on payments because supplies of inputs were not tied on time. The suppliers would also include suppliers of equipments and appropriate technology which is critical in power sector.

3.2.9 Off takers (Customers)

In infrastructure sector, there are two kinds of projects in terms of Off takers. One where off takers cannot be defined, like roads, ports and telecom where for demand projections we have to fall back on historical traffic/tariff studies and there are projects like power where the offtaker is the State Electricity Board (now called discoms). Once the offtakers are defined we can have a "Take or Pay" kind of agreement with them, which means a certain predefined payment will be made (under defined conditions) even if the offtaker is not able to buy the infrastructure output.

In case of non-infrastructure also the offtakers cannot be defined such as a textile unit or a logistics provider. In case of an automotive component maker, there could be an assured buyback form one or two OEMs but the character of such arrangement is not similar to take

or buy agreement described above. ***The project structure as described above can be summarized graphically as under:***

Project Structure


```
   Suppliers          Guarantor            EPC

Government  ──────▶  Project SPV  ◀────▶  Sponsors

   Off takers          O&M             Lenders
```

Successful project structure entals a win win situation for al
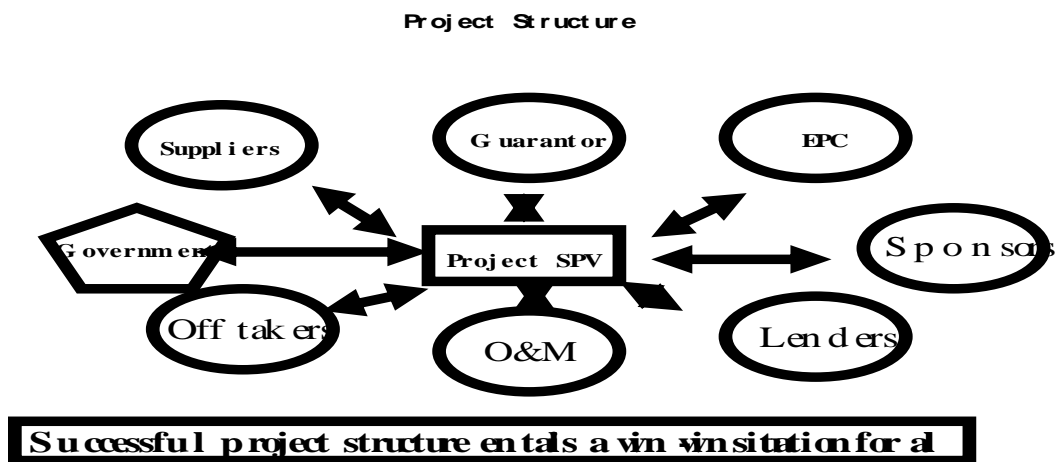
Key Transaction Documents and Contracts

A project company/structure defined in the previous section is unusual in the sense that it is set up to undertake a single project. From the perspective of a banker, documentation will be the primary evidence in case of any dispute with the borrower. Documentation will be useful to prove banks claims /charge against legal representatives, liquidators, official receivers etc. Correct documentation may also lay banks prior charge against the government, other creditors etc. In case of disputes referred to a court of law documentation may help in proving banks case against the defaulter. Since a party to a project will agree to assume risk at a reasonable price only if it understands that risk clearly, project finance is appropriate only for infrastructure projects like power stations, roads, railway lines, airports and telecom networks that involve established technologies. In the case of non-infrastructure projects like textiles, chemicals, steel and cement also the project lender is in a similar position*.* Correct documentation at the development stage helps in monitoring the project during the construction and operational stage as it makes terms and conditions for operational performance legally binding. However, Project finance may not be suitable for projects that involve complex or unproven technologies as suggested by the

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inability of the UK Government to arrange project finance for research and development projects.

There are two categories of documents in any infrastructure or non-infrastructure projects. They are Project Documents and Financing Documents.

3.3 Key Project Documents

3.3.1 Concession / License Agreement *(Infrastructure projects)*

In the case of infrastructure projects like road, port, airport, this is the first agreement that the project SPV signs through bidding or a tender system. It is an agreement with the Government granting the right to the project vehicle to develop the project. It is called by the name of Concession Agreement in Road Projects, Licensing Agreement in case of Telecom projects where licenses to particular circles are bidded by the telecom service providers, Operations, Maintenance and Development Agreement (OMDA) in the case of Airport Privatization and Memorandum of Understanding (MOU) in the case of Power Projects. The concession agreement delivers the project site to the private developer. Usually in the concession agreement the Government /Public body agrees to meet the Rehabilitation and Resettlement (R& R) expenses if any. The concession agreement specifies the term of the agreement like 12 years in case of 6 laning projects in road sector and also specifies the termination rights in case of end of concession period or Force Majeure closure in the event of Political/ Non political disturbance. It lays down technical specifications and terms and conditions for any direct agreement of the state with the Special Purpose Vehicle called the State Support Agreement, (SSA) which mitigates political risk to a large extent. Concession agreements also clearly list down the procedure for land acquisition and substitution agreement. Other infrastructure projects like power do not involve concession agreement*.*

3.3.2 Shareholders Agreement (SHA)

This is the agreement between all the shareholders of the SPV, including project sponsors/promoters that establish the shareholding pattern, the shareholders representation in management, terms of conversion of PE investors' debt into equity, exit route for PE investors, minority protection rights, if any. SHA arises when there are other equity partners like PE investors apart from sponsors/promoters and has relevance to both

infrastructure and non-infrastructure projects. It clearly establishes the decision making process in reserved matters. From bankers point of view Shareholders agreement clearly defines the cash calls and remedies available against funding defaults by one shareholder. In case of disputes the agreement defines the shareholders exit process and Right of First Refusal (ROFR) to other shareholders.

The Shareholders Agreement is critical as it ensures that equity funding is fully tied up and available to the SPV as per its financing requirements. It attempts to ensure a smooth functioning of the SPV and ensures that certain decisions are made with the concurrence of all shareholders as opposed to simple majority of the SUV's board. It lays down a simple process by which a shareholder can monetize its shareholding and the rights of other shareholders in such an event. This helps the banker in clearly resolving disputes between shareholders once the SPV starts getting profits. It also prevents the project from suffering losses on account of Shareholders apathy, as it defines rights and responsibilities clearly.

Recently there have been conflict between the sponsors/promoters and PE investors based on the provisions of SHA.

3.3.3 Engineering Procurement and Construction (EPC)contract

It is an agreement between the SPV and EPC contractor that establishes the EPC contractors that establishes the EPC contractors sole responsibility in designing, procuring, constructing, testing and finally commissioning the plant /facility according to specifications laid down in the contract within a specified date and a certain cost. It lays down guaranteed and minimum performance parameters which the EPC contractor will need to achieve. It also fixes the responsibility of the contractor to rectify the plant if it fails to meet Guaranteed Performance parameters and penalties/ Liquidated Damages if the plant fails to meet performance parameters. Liquidated Damages are also used against time overruns if any by the EPC contractor. Typically liquidated damages are capped at 20% of EPC contract value. Once the project is executed and in post commercialization period any defect in design of rod/plant is found the EPC contractor is liable to pay a Defects Liability.

A well laid out EPC contract protects the project against time and cost escalations particularly if it is fixed time fixed price contract. Still a limited cost overrun support is sought by the bankers from the sponsors. The selection of EPC contractor is critical; in power sector it becomes mandatory to select a qualified EPC contractor through an international bidding route. However in road sector it is often seen that the SPV awards the EPC contract back to one of the sponsors as many sponsors of SPV's in Road projects are construction contractors themselves. In certain power plants now EPC contracts are not awarded at all, as plants are developed on Boiler Turbine Generator (BTG) basis as the sponsor of the SPV procures the most critical parts on individual contract basis called the Balance of Plant (BOP) contracts. This happens only when the sponsor has an extremely strong track record in the sector. Also by seeking warranties from the contractor the SPV ensures that for adequate defects liability period spare parts are available and repairs are carried out by experienced personnel at zero or low cost.

3.3.4 Operations and Maintenance Contract

It is an agreement between the SPV and O & M contractor that establishes the responsibility of the O &M contractor to operate the plant/ facility to ensure that the availability of project /facility. It clearly defines maintenance obligations that will ensure that the project/facility is maintained as per the industry best practices. It also specifies bonus payments to the O & M contractor, for exceeding predetermined performance parameters and penalties for under achievement. The O & M contract ensures a certain level of mitigation of operating and performance risks.

3.3.5 Power Purchase Agreement (PPA*)*: (In the case of Power Projects)

This is the most important document which is directly related to the sale of electricity and cash-flow generation. This establishes the power-sale obligations between the project company and the utility. There are several types of PPAs. 'Take-or-pay' type contract is the best choice in case bulk power is sold to a public sector utility. The take or pay contract means that there is a contractual obligation to make periodic payments in future for an agreed off-take of power at a set price and the purchaser must make specified payments

even if it does not require the power at a particular time and the agreement can only be cancelled by mutual consent. Some other provisions of PPA that define each party's responsibilities and penalties in case of non-performance under agreed terms are (i) Nature of the plant, (ii) Base load or peaking plant, (iii) Tenure, (iv) Conditions for the PPA to come into effect, (v) Interconnection facilities, (vi) Deemed commissioning clause, (vii) Tariff determination, (vii) Security conditions, (ix) *Force majeure* clauses and (x) Termination payments. Initially when new Independent Power Producers (IPPs) were set up, PPA was the preferred route for sale of power. Subsequently, IPPs have chosen to sell a limited portion of power through PPA and rest through merchant sales (Open Access). PPA provided comfort to project lenders in respect of assured offtake and payment and certain pass through expenses. However, the IPPs felt that opportunities should not be missed for enhanced earnings through sale of at least part of the power to public sector and private power trading/distributing companies like Power Trading Corporation, Tata Power, and Reliance Power etc. Merchant trading definitely gives higher revenue to the borrower or producer, however, recovery of fixed charges is not assured in case of merchant sale.

Up till now, Independent IPPs used to approach banks for financial assistance after entering into a long-term PPA with the state utilities/intending purchasers. This helped in assessing the revenue flows from the project and establishing the financial viability of the project. Keeping in view the present policy of entering into PPA by state utilities, based on competitive bidding only, the banks are being approached for financing of power projects even when the sale tie-up has not been entered into. Promoters now have to bid for supply of power and then enter into PPA with the intending buyers. In view of this, a realistic assessment of revenue flow is difficult to ascertain; hence it has to be assessed on the basis of tariff structure prevailing at the time of appraisal of the project – determined through the competitive bidding route. Therefore, a pre-disbursement condition for entering into PPA for part capacity (so as to have a debt servicing of minimum 1.10) is being stipulated. As the Electricity Act, 2003, allows trading in power and provides for further deregulation, Power Trading Companies are being established to trade in power. Promoters are also entering into PPA with PTC India Ltd for sale of power on a long-term basis. The PTC, in turn, enters into back-to-back PPAs with the state utilities.

3.3.6 Fuel Supply Agreement (FSA) and Fuel Transportation Agreement (FTA): A reliable and confirmed Fuel Supply Agreement (FSA), the terms of which match with the terms of PPA, is an integral part of the security package. The FSA contains evidence of the existence and dedication of fuel reserves sufficient to meet the project requirements for the duration of the agreement. Some key provisions of this agreement are (i) Period – which should be at least at least for the currency of the term loans, (ii)   Conditions, (iii) Precedents, (iv) Commitment advance, (v) Earnest money, (vi) Obligation to sell and purchase coal, (vii) Quantity and delivery of coal, (viii) Loading and delivery, (ix) Quality of the coal, (x) Liquidated damages, (xi) Purchase price for fuel, (xii) Payment terms (xiii) *Force majeure* and (xiv) Settlement of disputes.

Clearances/Consents/Approvals: Given in Table below is an illustrative list of clearances required for a power project.

List of Clearances Required for Power Projects

a. Item	*b. Agency*
(a) Statutory Clearances	
• Water Availability	Water Resources Department, State Government.
• Section 18A Clearance • (State Government Concurrence), Registrar of Companies	State Government
• Pollution Clearance, Forest	State Pollution Control Board
• Environment & Forest Clearance, Rehabilitation & Resettlement	Ministry of Environment & Forests, Government of India
(b) Non-Statutory Clearances	
• Land Availability	State Government

• Fuel Linkage	Standing Linkage Committee Department of Coal
• Transportation of Coal	Ministry of Railways
(c) Other Clearances	
• Foreign Investment Promotion Board Clearance	Foreign Investment Promotion Board
• ECB Clearance	RBI
• Forex permission for foreign equity	RBI

For each project, both infrastructure and non-infrastructure, the set of approvals required needs to be identified with the help of the sponsor/promoter, reference to similar projects financed in the past, lenders' counsel, external experts etc. The primary responsibility for identifying the set of approvals required should be pinned on the sponsor/promoter.

3.4 Financing Documents

Documents that govern the financing of the project as agreements between SPV and project lenders are referred to as Financing Documents.

3.4.1 Loan Agreement

The first of these agreements is a loan agreement, which can depending on the bank and structure being used may be called as Common Loan Agreement, Facility Agreement, Rupee Facility Agreement, Senior Loan Agreement etc. It defines the amount and purpose of the loan and the term of the loans or repayment schedule. Normally the repayment schedule of Infrastructure loans is a balloon kind or step up repayment schedule with a defined moratorium period based on the gestation period, expected timeframe for stabilization of commercial production, DSCR trend etc. Similar repayment schedule is common in the case

of non-infrastructure projects. Seasonality is also built in – toll collection in a road project during monsoon months, non crushing period in a sugar project – to site two examples. The loan agreements specifies the interest rates which because of the long tenure of the project are generally floating interest rates pegged to a benchmark like Base rate of the lead bank or average Base rate of the top 4/5 lenders to the project. No external benchmark like GoI securities has emerged in our country for linking the rate of interest of long term project loans. London Inter Bank Call Money Rate (LIBOR), in case of foreign currency loans is used. Generally the interest rates come with a reset clause. This clause provides hedge to the project lenders. It is also customary these days for the sponsor/promoter to include a clause for prepayment/refinance at the time of DCCO or interest rate reset. The loan agreement defines the pre-commitment and pre-disbursement conditions, which are discussed in detail in the next section. The drawdown schedule or disbursement schedule is prepared in consultation with all lenders and it is stated in the Loan Agreement or separately*.* The loan agreement clearly states the Debt fees/service, representation and warranties and the conditions which may be deemed as events of default and the dispute resolution procedure to be followed in case of default.

434.2 Inter-creditor Agreement

Where the quantum of project loan is large as in the case of infrastructure project in general and non infrastructure projects like steel, cement etc., the project loan is arranged by the process of Debt Syndication. Since in syndication the number of participating lenders for a large project is high, an agreement is put in place amongst the lenders and is are critical and facilitates in coordinated action and harmony of terms and covenants of all the lenders. It also prevents action by any single lender. This agreement preserves the right of each individual lender against the borrowers by writing a procedure for the same in the agreement. The agreement specifies Lenders of Facility agents if appointed and the rights and responsibilities are clearly spelt out.

The Project Documents and Financing document along with the key contracts listed above are called as "Transaction Documents" of the project.
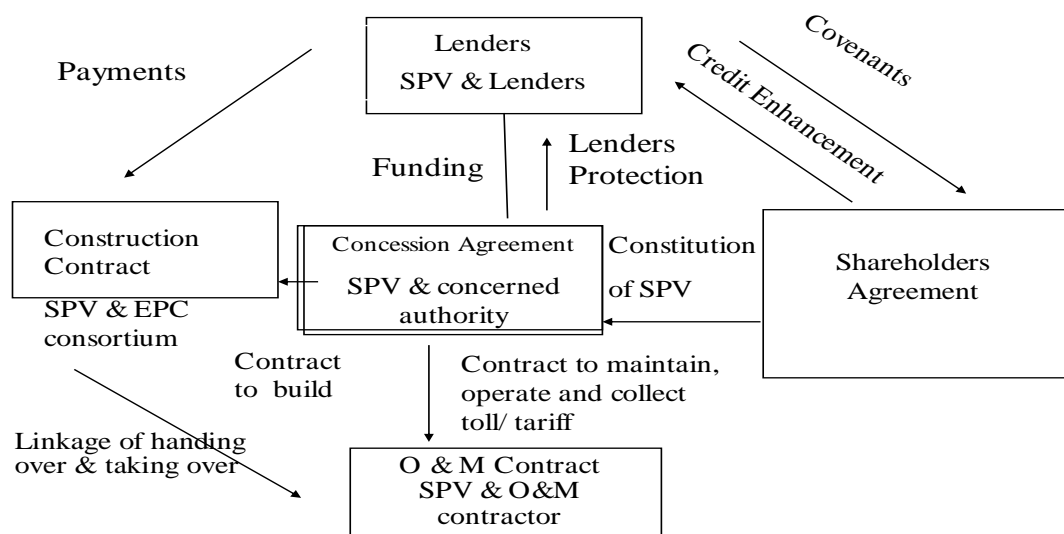
Figure depicts the contractual linkages discussed above. At the center is the SPV and concerned Government Department / Authority which is bound by a concession agreement. Lenders are contractually obligated to give funding and borrowers (SPV) are contractually obligated to protect the interests of the lenders. Shareholders agreement plays a key role in the constitution of the SPV. It works as a credit enhancement for lenders and lenders use the provisions of Shareholders agreements as financial covenants. Lenders and SPV gives payments to EPC consortium with a contract to build and the O & M consortium is linked to the EPC consortium for handing over and taking over of the project sites. O & M contractor has the contract to maintain operate and collect the revenues.

The strength of Transaction Documents forms the basis of Project Appraisal by the bankers. If all the project parties are bound by iron clad contracts at this stage and all risks plugged in then there is little chance of project not being successful.

3.5 Project Appraisal by Banks

In the previous sections the critical project documents have been briefly explained. Hereafter, the process of detailed appraisal followed by lending institutions is elaborated. The detailed appraisal covering all the three stages identified earlier consists of several segments and can be grouped under the following four heads.

3.5.1 Management Appraisal

The lenders analyze the management (group) in terms of their past record in managing projects, performance of their group companies, their exposure and relation to the sponsoring company, commitment of resources required for the proposed project and other commitments of the sponsor. The synchronization of their existing activities with the project to be undertaken is also seen. Professional management is critical but more so is the project team which the sponsors have put in place. The sponsors may do very well in other areas of business but the project team is the deciding factor for the infrastructure and large non infrastructure projects. Sometimes, one can ask for "Key Man Insurance" as well. Also the lenders should feel comfortable of the fact that the sponsors may give additional equity (contingent equity)in times of crisis. Sometimes if the sponsors have international business interests and the performance of such business ventures is good it improves the perception of international lenders towards the sponsors. Also, if the group companies of the sponsors are listed on the stock exchange, this is a position of strength to the lenders as the sponsors will face reputational risks if something wrong happens with the project. At this point it may be critical to evaluate especially in the case of two or more sponsors in the SPV that there is no internal squabbling. Anyways the bankers try to address this issue by the documentation of Shareholders agreement discussed earlier and by putting a no dividend clause at least for some years so that the interest of the sponsors are maintained in the project.

3.5.2 Technical Feasibility

Though the management quality plays key role in project appraisal process, in the final analysis the project structure centers on the technical feasibility. Financial standing of the sponsors doesn't really matter if technical aspects of the project are not really understood and appraised. Some of the key factors that influence the selection would be proven technology, capital and operating costs and probability of obsolescence. Some of the most important technical aspects that need to be addressed are the availability and appropriateness of technology, the reputation and basis of selection of equipment suppliers, the terms of supply including the Liquidated Damages and Defects Liability discussed above. Keeping in mind the complexities involved in technical appraisal and due

to lack of in-house expertise, lenders often engage the services of variety of outside consultants who are experts in their own rights to assess the veracity of the estimates made in technical feasibility study. These independent consultants are called as Lenders Independent Engineer (LIE) and Lenders Legal Counsel (LLC) to look into the validity of contracts. The LIE can be appointed for different phases of the project like only for Project Review and assessment (Date of appointment till closure) and then subsequently for construction monitoring and performance testing. Some banks also engage them for an annual optional review. It is critical for the lenders to understand that in conventional projects they may still accept the various assumptions given by the borrower on cost of inputs and overall cost of project, herein each element of the cost submitted by the borrower needs to be vetted by the LIE. If the deviation is more than 5% between what the borrower has predicted and what the LIE has assessed then the appraising officer needs to investigate as to the reasons. Also in the case of certain road projects when the sponsors themselves get the EPC contract, there may be instances of cost pad up which needs to be looked into. Normally the cost of EPC contract must be in the range of similar EPC contracts executed for similar projects and this has to be verified by LIE. Besides this there are numerous studies that LIE's do assess the techno-economic viability of the project.

In the technical analysis all contractual aspects of the project like statutory clearances, environmental clearances and project contracts such as EPC, O & M , Offtake agreements, Raw Material supply and transport and credit worthiness of the off taking party needs to be assessed as well. While these independent consultants do bring value to the project appraisal process and command good respect among the lenders, the latter however cannot wish away potential risk arising out of inadequate appraisal of the technical aspects. The lenders should exercise caution and be judgmental on such independent reviews. Further in addition to this the lenders usually obtain expert views on tax and accounting matters.

3.5.3 Commercial Viability

Commercial viability of a project is the bedrock of private participation in infrastructure. Private participation in Infrastructure project would become a non-starter if there is no possibility of the project being structured on commercial lines. The whole issue here is being

discussed under the presumption that projects are amenable to commercialization. In other words, like in case of any other corporate project, the project company should be able to earn a return on investment that is comparable with other alternatives available to the prospective investors. Though infrastructure projects are unique in several ways, the common thread that binds them together is the "return on investment". It is therefore, natural for the lending institutions to look at viability of the project from the commercial angle.

While in case of Corporate finance it is easy for lending institutions to take a view on the commercial viability, in the case of infrastructure projects it is more complex. This is so because, while in a typical corporate environment, the return is primarily driven by the demand supply price equation for the end product, it is not so in the case of infrastructure projects. For infrastructure projects, the return on investment is the function of several external factors such as government policies, regulatory interventions and price fixation and public interest/acceptance of tariff etc. Chiefly the appraiser should analyze the impact of market / non market and technical factors that would influence the commercial viability of projects.

3.5.4 Financial Appraisal

Financial appraisal, to define briefly, refers to the process of evaluation of viability of a proposed project by assessing the value of (i) net cash flows, (ii) capacity for debt servicing, (iii) capacity for returns to shareholders and sensitivity analysis. The financial appraisal aims at analyzing the volume of cash flows - outflows and inflows and its time value. More specifically financial appraisal involves evaluating the cash flow model developed by project sponsors from the lenders perspective and process of taking a view on the integrity of the said model. Most often the sponsors prepare the cash flow model with an upside attitude. It is in this stage lenders impute their risk perception about the project in to the cash flows and judge the downside of the project. Thereafter, the lenders will temper the projections to reflect the lenders assessment and prepare a "Base Cash Flow Model". Thus financial appraisal is an effective and standardized tool to bring in a level of tolerance in cash flow projections, which the lenders find comfortable, and remove uncertainty. It is an important stage in the detailed project appraisal process.

3.5.4.1 Financial V/s Economic Appraisal

Financial appraisal differs from economic appraisal in the scope of its investigation, the range of impact analysed and the methodology used. A financial appraisal essentially views investment decision from the perspectives of the organization undertaking the investment including lenders. It therefore measures only the direct effects on the cash flows of the organization of an investment decision. By contrast, an economic appraisal considers not only the impact of the project on the organization sponsoring the project, but also considers the external benefits and costs of the project for other Government agencies, private sector enterprises and individuals - regardless of whether or not such impacts are matched by monetary payments.

Financial appraisal also differs from economic appraisal in that: market prices and valuations are used in assessing benefits and costs, instead of measures such as willingness to pay and opportunity cost. The discount rate used represents the weighted average cost of debt and equity capital rather than the estimated social opportunity cost of capital. The discount rate and the cash flows to which it is applied are usually specified on a nominal basis as the cost of debt and cost of equity are observed in only nominal terms.

The steps undertaken in conducting a financial appraisal are as follows:

3.5.4.2 Cost of the Project

The bank needs to determine the accuracy of cost estimates, suitability of the envisaged pattern of financing and general soundness of the capital structure. The following aspects need to be analysed for impact:

Itemized cost of the project

Conceptually, it is the total of all items of outlay associated with the project which are supported by Long Term Funds represented by equity and term loans. Inaccurate estimate of the total project cost i.e., either underestimated or overestimated cost projections will have an adverse impact on the ultimate course of the project. Under estimation will inevitably lead to a cost overrun and hamper the project implementation because of the likely delay in obtaining of additional funds at a later stage for matching the overrun. Over estimation, on the other hand, will inflate the total project cost and thus affect its financial

strength. The assessment of capital cost of the project involves a vigorous check of the financial projections provided by the sponsors on the following aspects: Padding or underestimation of costs, specification of machinery, credibility of various suppliers, allowances for contingencies, inflation Factors and estimation of the working results. Projections supplied by the promoters regarding the sales, realizations and profits are assessed by checking whether a realistic market demand forecast has been given. Price computations for inputs and outputs are based on current quotations and inflationary factors. Appropriate time schedule for stabilization of commercial production and capacity utilization is given and cost projections to be distinguished between fixed and variable costs appropriately.

3.5.4.3 Means of finance

It requires analysis of proportion of Equity (owned funds) and Debt (borrowed funds) to finance the entire cost of the project. The gearing depends on nature & size of the project, capital intensity, promoters' capacity, importance to national economy. There is no standard for project debt / equity ratios prescribed for any project. One of the deciding factors of the D/E ratio is the debt servicing ability of the project. In the case of infrastructure companies, the D/E ratio is generally higher. (*DER is calculated as – Total debt/TNW, Benchmark DER would vary based on definition.)* Power sector financing guidelines issued by the Government of India allowed leveraging upto 4:1 (viz. 80% debt), however lenders are usually comfortable with 70:30 (i.e. 2.33). In most non-infra projects, D/E more than 1.5 is also considered high. Equity represents long term capital provided in exchange for shares representing part ownership of the company. Equity holders are primarily sponsors and minority investors. Investment is in the nature of equity or preference shares. In case of availability of State subsidies, it is taken as capital. In order to promote investment in particular sector or region, the State or Central Government accords financial concessions basically towards supporting the viability of the project as far as the developer is concerned. The banker needs to examine riders and compliance requirements. As subsidy is basically public money being allocated, a number of compliances would need to be taken care of before funds can be drawn e.g. Drawl on reimbursement basis. The borrowed funds are generally term loans which are usually termed as / take the form of senior debt and are sourced from banks / financial institutions – domestic / overseas, either

in consortium or multiple banking. It requires interest & principal servicing required at monthly / quarterly intervals, subject to restrictive covenants / prudential norms.

The credit officer should go by benchmark defined by the Bank for DER and the delegated authority for approval of deviation.

3.6 Capturing Cash Flows

While negotiating the terms of the loans, it is also pertinent to factor in a repayment profile such that matches with the inflow profile. The repayment profiles could be Equal, Front ended, Back ended, Ballooning, Bullet or Equated. The borrowed funds can be unsecured loans / deposits and Subordinate debt; can be considered as quasi equity. Subordinated debt represents finance with repayment priority over equity capital but not over commercial bank loans or senior debt in the event of default or bankruptcy. Such debt is usually provided by sponsors and has an outlined schedule for payment of interest and repayment of principal. As all payments are subordinate, contract may contain provisions for sharing up-sides. The timing of infusing owned / borrowed funds depends on the phase of development of the project. Equity is infused in the early stages of development, while debt financing follows – after financial closing. It is critical to determine the extent of profitability of the project and its sufficiency in relation to the repayment obligations pertaining to debt assistance and servicing of sponsor interests. Entire transactions of the project are routed through **Trust & Retention Account (TRA**) where payments/disbursements are done during operations as per agreed pattern. A waterfall mechanism is shown below in Figure 5 wherein sub accounts and specific charges are created on the main account, implying that revenues of the project must meet operating expenses, admin cost, then debt payments, then Debt service reserve account wherein two - three quarters of installments are kept as cushion against default and then finally sponsors can get profits. Unless the previous bucket is full, the money will not go into the next one.

It is necessary for the Bank to stipulate TRA mechanism in infrastructure projects like roads and ports and debt restructured under CDR framework in both infrastructure and non infrastructure projects.

A typical TRA with waterfall mechanism is given below:

Diagram – Waterfall Account

The Cash
Waterfall

Operating Expenses
Fuel costs
Approved O & M Costs
Approved Administrative Costs

Debt Service

Payment on
Senior Debt

Payment on
Subordinated
Debt

Debt Service
Reserve Account

Equity
Distributions

Maintenance
Reserve Account
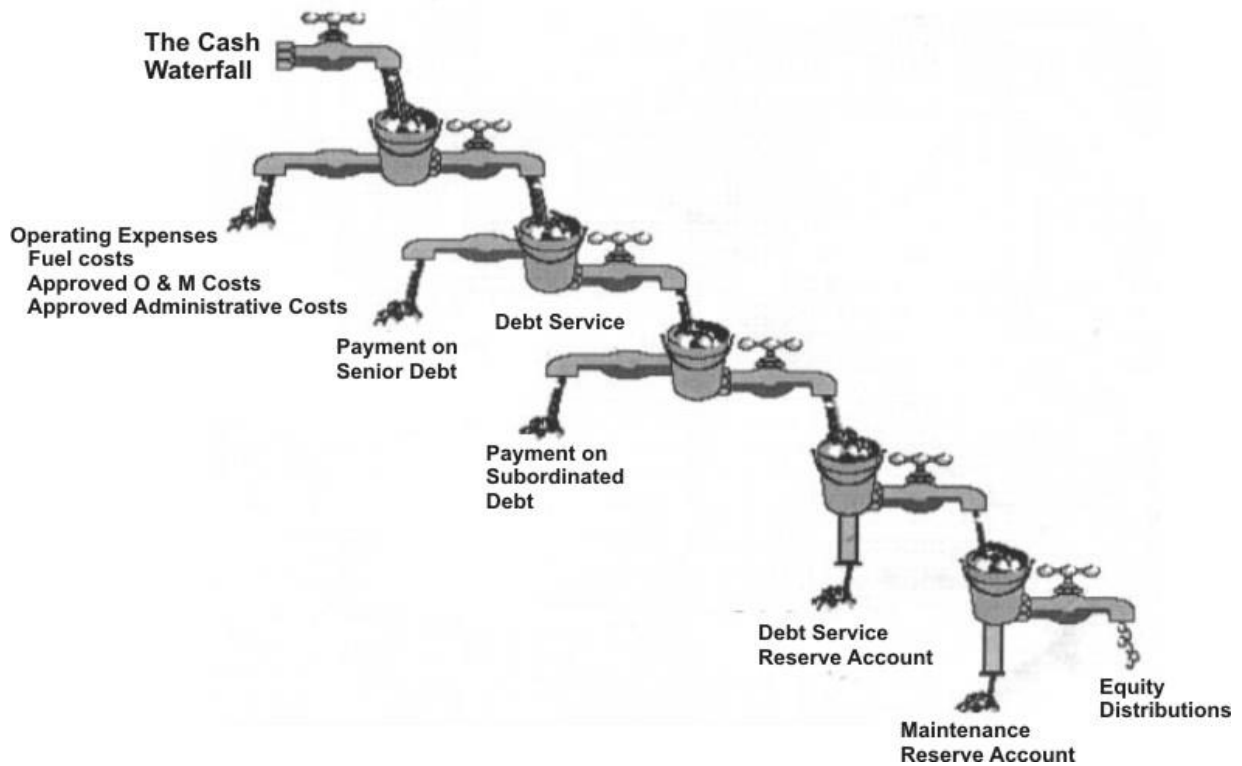
3.8 Key issues to be looked into while appraising projects in each sector are summarized below:

Critical issues

Sector	Key Review Issues
Roads	(i) Traffic study by a reputed consultant (ii) Financial projections & sensitivity analysis (iii) Estimate of project cost per km

	(iv)	Land acquisition tied up
	(v)	Right of way established
	(vi)	Debt servicing/repayment structure
	(vii)	Concession period vs. repayment schedule (tail period)
	(viii)	Major Maintenance Reserve account and success fee
	(ix)	Technological competence of O & M Contractor
Power	(i)	Land acquisition
	(ii)	Type of Plant
	(iii)	Plant Load Factor
	(iv)	Technology appropriateness
	(v)	Power Purchase Agreements/Contingent Buyers
	(vi)	Availability of fuel (FSA, FTA)
	(vii)	Plant & equipment linkages
	(viii)	Technology Linkages with networks in transmission, Pancaking, Congestion, Distribution Losses
	(ix)	Financial projections & sensitivity analysis
	(x)	Debt servicing/repayment structure
	(xi)	Multiple Licenses
	(xii)	Political issues
	(xiii)	Environment issues
Telecom	(i)	Upfront License fee
	(ii)	Technology Risk

	(iii) Right of way in laying cables,
	(iv) Spectrum availability and congestion
	(v) Network rollout
	(vi) Licence period vs. repayment period (tail period)
	(vii) Subscriber base
	(viii) Estimation of Average Revenue Per unit (ARPU) and Minutes of Usage (MOU)
	(ix) Sensitivity analysis
	(x) Debt servicing/repayment structure
Port	(i) Draft of the port
	(ii) Firm User linkages for revenue projections
	(iii) Concession agreement
	(iv) Connectivity
	(v) Traffic study based on hinterland connectivity
	(vi) Land acquisition
	(vii) Port Operator has to be a participant
	(viii) O & M on account of mechanization
	(ix) Landside Logistics
	(x) Containerization in term of Twenty Feet Equivalents (TEU)
	(xi) Container freight stations (Off Dock) and Inland Container Depots

	(xii) Financial projections & sensitivity analysis (x) Concession period vs. repayment schedule (tail period) (xiii) Debt servicing/repayment structure
Airports	(i) Land acquisition (ii) Concession agreement (iii) Revenue streams (iv) Financial projections & sensitivity analysis (v) Debt servicing/repayment structure (vi) Degree of asset control is minimal, (vii) Concession period vs. repayment period(tail period) (viii) Continuous Capex (Mandatory capex to be funded by equity)
Urban Infrastructure	Limited Financing Transactions based on recourse to specific revenue streams Pooled Financing – a single entity raising Finance to fund a group of ULB's
Special Economic Zones	Project with implementation risks and market risk R & R and occupancy important elements for SEZ projects

The grid would be the same for non-infrastructure projects like steel, textile, cement etc. except that aspects like concession agreement, traffic study etc. typical of a BOT/BOOT project would not arise. On the other hand, environmental, land acquisition and social

issues are sensitive to non infrastructure projects also. The hardships faced by large scale projects in cement, steel, hydrocarbon and metals in the recent years are good examples.

3.9 Security/Security Documents

Security documents are important part of financing documents. They protect the lenders in the event of default by the borrower. The documents define the claim of senior lenders over the subordinate lenders. In times of crisis, it allows lenders to assume control over the project assets. The assets which are available for security are Land Building Plant and Equipment of the SPV or project assets besides receivables and book debt and other contractual rights and intangible assets. The security documents generally involved in Infrastructure projects are

Uniquely the asset created out of project financing may not be available to the lenders. Road/port are relevant examples. The securities/comforts available are:

(i)   Toll receipts under TRA/Escrow mechanism

(ii)   Right of substitution under which the lenders can replace the developers subject to the provisions of the Concession Agreement.

(iii)   State support agreement for enlisting state assistance in acquiring land, right of way etc.

(iv)   NHAI owns responsibility to acquire land and handover to the developer.

(v)   Any other collateral available to the lenders.

In the case of telecom sector, the fixed assets created are in the form of network, software, last mile connectivity etc. These expenses are capitalized and amortised over a period of time as per accounting standards/tax rules. Here too, the main security is TRA/Escrow of revenue.

3.9.1 Mortgage Document, Deed of Hypothecation

In respect of some infrastructure projects, as most of the assets which are available to be offered as securities are project assets and the project assets are under the concession agreement with a Government department there is little by way of tangible security which is created in respect of infrastructure projects like roads, ports and airports. In the case of a

power project, security in the form of mortgage of land & building, plant & machinery is available. In telecom projects, project finance creates tangible assets only for part of the amount disbursed. Other assets that are available for security are equipments, bank accounts (TRA), receivables of project assets and pledge of sponsors/promoters shareholding, fully or partly. Assignment of licence, brand, key contracts etc should be explored and negotiated. Lenders also derive rights under the concession agreement like substitution. Final call should be taken as per delegated authority

In the case of non infrastructure projects, tangible security of project assets i. e, land & building, plant & machinery will be available especially manufacturing projects. In the case of services projects, creation of tangible project assets may not happen to the full extent of the project loans disbursed like ITES. Collaterals like pledge of sponsor/promoter shareholding, personal guarantee/corporate guarantee should be explored. Final call should be taken as per delegated authority

Share Pledge agreement by the sponsors/Negative lien

Normally the Bank insists on pledging of equity of sponsors in the project SPV, however in certain cases Bank may accept negative lien, which is not exactly a charge, as per delegated authority.

Assignment of key contracts

Concession agreement, Licensing Agreement, Insurance contracts, Off take agreements, Construction contracts etc. are assigned to the banker. In the light of lack of tangible security the assignment assumes importance in certain types of infrastructure projects. Various guarantees are sought for mitigating risks such as (i) from sponsors/promoters completion guarantee, (ii) from concessioning authority termination payments and (iii) force majeure guarantees from insurance company, (iv) construction guarantee from project contractor, (v) performance guarantee from supplier etc. The deed of assignment of contracts will attract advalorem stamp duty; assignments are included as a part of English mortgage. Stamping authorities have not levied additional stamp duties.

Risk/Security Package
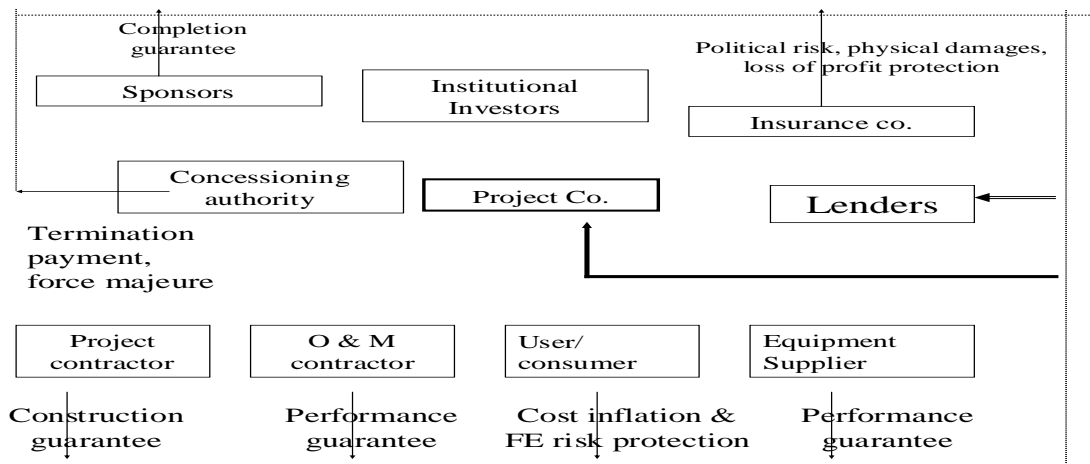
3.9.2 Security Structure (Power Projects) : Mitigation of the payment risk by SEBs/off-takers is critical for ensuring the viability of the power projects. In addition to direct payment, security package, in the form of Letter of Credit (LC) and Escrow Agreement (EA), serves as a temporary measure for enhancement of creditworthiness of SEBs/off-takers. State Government Guarantees may also be explored, although currently most state governments do not extend guarantees.

Although the security structure has been envisaged for payment dues, SEBs/off-takers in the normal course are expected to make direct payments within a stipulated period from the date of presentation of the invoice. The money in the escrow account is 'flow-in' and `flow-out' and the cash in the account will be trapped only in the event of default.

Direct Payment: The project company would raise the invoices on a monthly basis, i.e. after generating and supplying the power to SEBs/off-takers for a period of one month. SEBs/off-takers would have two options of making the payments according to the specification: (*a*) number days (say 5 to 10) from the presentation of the bills and avail of the discount; or (*b*) time (say 30 days) from the presentation of invoice, but avail of a lower discount (say 1 per cent).

Letter of Credit*:* The SEB/off-taker shall also maintain an irrevocable, standby, unconditional, letter of credit issued by an acceptable creditworthy bank in favour of the

project company. The LC will be opened in favour of the project company for an amount prescribed in the PPA (e.g. equivalent to one months' billing) from the date when the project company starts selling power. In the event of default in payment, the LC equivalent to one month's billing will be invoked.

Escrow Account: Escrow account is a part of the mechanism intended to capture the revenues of the purchaser in case of default in making payments to the project company. Escrow account is a designated account opened with a commercial bank – the main banker to the purchaser of power – supported by a structure designed to ensure that receivables of the purchaser are deposited to the credit of the said account only. The FIs/banks have developed a Model Escrow Agreement (MEA) that is more suited to vertically integrated SEBs in pre-reform era. In the unbundled scenario, i.e. when the SEBs are split into Transmission Company (Transcom), Distribution Company (Discom) and Generation Company (Gencom), the MEA would need to be modified to accommodate the two-tier escrow structure. Under the two-tier escrow mechanism, Level I escrow would be positioned between the consumers and Discom, and Level II escrow is envisaged to be positioned between Discom and Transcom. On default by Discom, Level I escrow is triggered and receivables are paid directly into the Level II escrow. On default by both Discom and Transcom, both the Levels I and II escrows are triggered so that the receivables are directly paid to the power producers by the consumers. The principles of escrow would however remain the same under both the scenarios**.**

State Government Guarantees: The state governments have been providing guarantees with a view to attracting investment into their respective states. This has been the practice and, over a period of time, the state government guarantee was recognized by lenders and sponsors as a part of the security package. However, lately state governments have not been extending their guarantees and most of the power projects are being funded without their guarantees. This is on account of the keener interest being shown by promoters in setting up power projects and on account of the fact that the lenders now feel that securing the receivables of the power project is a better security than the state government guarantee.

Trust and Retention Account: The project company opens and maintains a Trust and Retention Account (TRA) and deposits all the cash flows of the company into the said account, and, the proceeds shall be utilized in the manner and according to the priority to be decided by the lenders. A TRA attempts to discipline the utilization of the cash flows entering a project company. The TRA can be at two stages:

- *Implementation stage :* This TRA structure requires that during the implementation stage, all project funds (equity/debt) be placed into it. The main account is designated as the proceeds account, which captures all the revenues. Based on the implementation schedule, during the implementation phase, funds from this account are transferred to the construction account (sub-account) for meeting construction expenses; to the interest service account (sub-account) for meeting the interest payments during construction expenses. Withdrawals from this account are permitted on the basis of an approved project implementation plan that is permitted by project lenders on the basis of project status reports/certification regarding achievement of various yardsticks and milestones as agreed to at the outset. Such a mechanism is considered to be of paramount value to the project lenders, for ensuring end-use of funds and monitoring project implementation. It can serve as a useful tool for taking mid-course corrections, especially in the case of long-gestation infrastructure projects.

- *Operations stage:* Once the Project is fully implemented and starts generating revenues from its operations, the entire revenues continue to be captured in the Trust and Retention Account, while the construction and interest service accounts opened earlier are no longer required.

3.11 Summary

For the lenders, the deal represents a long-term commitment with many opportunities to go wrong and no easy way out except to book a loss/provision and run. The structure is built as robustly as possible, but when it comes to litigation, court systems particularly in India will inevitably tend to `defend' the borrower from the `oppressive' lender with no one covering the interest bill during these interminable delays.

Project financiers try to bolster the structure with belts-and-braces security and covenants as much as possible.   That doesn't prevent a litigation lawyer finding many delaying tactics through the courts. The bankruptcy costs (agency costs) can be very high in a workout as much from the delay as from the many professional teams that may need to be mobilized – engineers, lawyers, accountants.   The margins and payments in a project financing are usually woefully insufficient to fund any serious workout.

Now we have laid down the concepts and process. In the next chapter we will lay down the research methodology.

Chapter 4

RESEARCH METHODOLOGY

"Scientific Research is a systematic, controlled, empirical and critical investigation of hypothetical propositions about the presumed relations among natural phenomena" (Kerlinger, 2004).

"Research is the systematic and objective identification, collection, analysis, dissemination and use of information for the purpose of assisting management in decision making related to identification and solution of problems and opportunities" (Malhotra, 2005).

4. Research Objectives

4.1 Research Question One:

"In the light of the fact that most Infrastructure projects are funded as Project Finance, Do Indian banks' credit officers have the adequate expertise to evaluate and finance infrastructure projects ensuring safety of funds? Does the infrastructure appraisal process provide the mechanism to identify and measure the inherent risks with due diligence?"

Most of the Infrastructure funding is structured as "Project Finance" rather than traditional "Corporate Finance", where the lender looks at the cash flows of the project for repayments rather than security of the borrowers balance sheet. For bankers who look at the collaterals and existing balance sheets, this is a completely new paradigm. This leads to deficiencies in the manner in which project appraisal is conducted especially with regard to cash flow analysis and determination of the date of completion of projects. When commercial operations are delayed, a host of factors including the uncertainties surrounding the project are cited as the reason. But, when there are uncertainties, these have to be accounted for during the appraisal of the project and a proper cushion needs to be built to take care of these uncertainties. The present research therefore intends to focus on elaborating and describing the contractual, legal and structural issues involved in the appraisal of infrastructure projects from the perspective of Indian banks.

4.2 Research Question Two

As Project Finance is included in the definition of Specialised Lending by RBI and Basel II with specific risk weightages, does fall in asset quality brings risk to the bank capital and in what manner?

The Basel committee recognizes project finance as specialized lending, a separate sub-category of Corporate asset class. The primary source of repayment of the loan is income generated by the asset being financed rather than independent capacity of a commercial enterprise. Recently, the RBI issued guidelines on Implementation of the Internal Rating Based (IRB) Approaches for Calculation of Capital Charge for Credit Risk on December 22, 2011. Banks that meet the requirements for the estimation of PD will be able to use the general foundation approach for the corporate asset class to derive risk weights for Specialised Lending (SL) sub-classes subject to RBI approval. Banks that meet the requirements for the estimation of PD and LGD and/or EAD will also be able to use the general advanced approach for the corporate asset class to derive risk weights for SL sub-classes also subject to RBI approval. The new guidelines are actually incentivizing banks to finance Strong and high rated projects (essentially means BBB- or better), thus reducing the capital charges (from the 100% risk weight) and thereby resulting in interest cost savings which depending on individual bank may be passed on to customers, who in this segment are anyways price sensitive. However on the flip side, there is heavy disincentivisation if the project slips to satisfactory or below categories. So what it may mean to banks is that they will do well only to finance well structured strong projects, otherwise the capital charges are prohibitive.

What may result from this guideline is that, if we keep the spreads constant a higher capital charge may result in negative returns for some banks and repeated restructuring may push banks to take a lot of stress on their capital.

4.3 Research Question Three:

"Does restructuring correlate with high leverage that corporate employ to fund infrastructure projects?"

The increase in resorting to restructuring can be partially attributed to excessive leveraging by some borrowers during boom period. It is generally seen that the debt equity ratio of infrastructure projects is unusually high as the funding mechanism is generally "Project Finance" and higher debt may help the companies in lowering cost of capital and raising funds on project basis. We would like to correlate Defaults to Leverage under stressed economic conditions or regulatory/ clearances issues when the cash flows do not build up because of time and cost overruns.

4.4 Research Question Four:

Does restructuring increase the Indirect bankruptcy costs of Infrastructure firms thereby raising their cost of equity and debt?

Stress in Infrastructure sector may raise cost of capital for Infrastructure companies thereby making it difficult for them to raise funds to put in new projects. The can be ascertained by the decreasing stock prices of Infrastructure companies and loss of market confidence.

To offer suggestions in order to strengthen bank financing of infrastructure sector in India and effectiveness of restructuring mechanism.

4.5 Data Collection and Methodology:

4.5.1 For Research Question One, a field survey will be done on a sample size of 100 bankers who have appraised projects in corporate and infrastructure sector and the data will be analysed using SPSS software.

4.5.1.1 Survey Method: A structured questionnaire was designed to elicit information on:

(*a*) Credit officers' understanding of the structural differences between infrastructure and corporate projects while appraising the projects.

(*b*) Managers' attitude towards relative importance of credit scoring sub-variables on the overall credit score of each element of risk, as used in the credit rating mechanism.

(*c*) Methods of measurement of risk currently being practised at banks.

4.5.1.2 Questionnaire: A structured questionnaire, divided into three sections, was designed. In Section A appraising officers were asked to give their opinion on the relative importance that they give to each variable under identified elements of project appraisal such as Management quality, Market potential (including demand and pricing issues), Technical issues, Construction issues, Operations issues, Legal issues, *Force majeure* issues and Funding issues (including factors and critical ratios). A five-point scale (least important to most important) was used and each broad element was further divided in five risk variables which together make up the entire element. Often a similar credit scoring model with similar risk variables is used by banks to rate a particular project. The rating class to which the project belongs signifies the level of risk and the pricing.

In Section B, managers were asked questions about specific risks which affect both the sectors. The questions were based on pre-decided checklists (data collected on nominal scale).

In Section C, managers were asked questions on their appreciation of structural issues as well as creation of security in infrastructure projects. The questions were based on a five-point scale as well as details based on pre-decided checklists. Thus, both metric and non-metric data were proposed to be collected through the questionnaire.

The following hypothesis was tested for Research Question One

4.5.1.3 Hypothesis (HO)

Hypothesis is an unproven statement or proposition about a factor or phenomenon that is of interest to the researcher (Malhotra, 2005). Two hypotheses are offered.

4.5.1.3.1 First Hypothesis: For Project appraisal and risk analysis, hypothesis testing is related to differences between mean of two samples, that is credit officers who have appraised projects in the Road Sector and the Power Sector.

- **H0 = Attitude of credit officers towards relative importance of credit scoring sub-variables on the overall credit score of each element of risk, as used in credit rating**

mechanism, is not different from sector to sector while appraising projects in the chosen sectors of Road and Power.

- **H1 = Attitude of credit officers towards relative importance of credit scoring sub-variables on the overall credit score of each element of risk, as used in credit rating mechanism, depends on inherent risks unique to the sector and status of the promoter.**

4.5.1.3.2 Second Hypothesis: For the structural differences between corporate and project finance, hypothesis testing is related to the differences between mean of two samples – that is credit officers who have appraised projects in both the infrastructure sector and the traditional projects started by the corporate sponsor.

- **HO** = Banks are using 'with recourse' structure to fund Infrastructure Projects which is not different from financing corporate projects.
- **H1** = Banks are using project finance structure to fund infrastructure projects with 'no or limited recourse' which is different from financing corporate projects.

4.5.1.4 Measurement and Scaling

The primary scales used in the questionnaire are:

Nominal Scale: It is a scale whose numbers serve as labels or tags for identifying and classifying data. (Malhotra, 2005). This scale was used for both identifying the respondents' experiences in project appraisal and classifying them based on their expertise in project appraisal and in a particular sector. This contained certain other multiple choice questions.

Interval Scale: It is a scale in which the numbers are used to rate objects such that numerically equal distances on the scale represent equal distances in the characteristics that are measured. This is used to study the perception of credit officers towards structure and scoring risk drivers.

Non-comparative scaling techniques and itemized rating scale in particular are based on sources of risk. Banks often use similar scales for scoring credit risk which is subsequently used in pricing the 5-point Likert scale. A measurement scale with a brief

description of risk factors of appraisal was used. The factors that were identified earlier through descriptive research are: Management quality; Market potential including demand and supply issues; Technical issues; Construction issues; Operational issues; Legal and *Force majeure* issues; Funding issues; and critical ratios. Under each factor five distinct risk variables were identified, which, if not properly addressed, becomes sources of risk.

4.5.1.5 Statistical Techniques for Hypothesis Testing

Univariate techniques were used as there is a single measurement of each element in the sample. The data collected were both metric and non-metric as the questionnaire used both interval and nominal scales. As data for corporate and infrastructure projects as well as road and power sectors were drawn from the same group of respondents, it was considered as paired data.

4.5.1.6 Tabulation and Hypothesis Testing: Frequency distribution tables were made for all elements of the appraisal process with mean scores of each risk driver. Hypothesis testing was done only for the data collected on road and power sectors. Null and alternate hypotheses are described earlier. Hypothesis testing in the present research consisted of testing of differences and as the alternate hypothesis lacks direction, two-tailed tests were used.

Both parametric and non-parametric tests were conducted. For data which was measured on interval scale, parametric tests were used and for data which was measured on nominal scale, non-parametric tests were used for hypothesis testing. Parametric tests provide inferences for making statements about the means of parent population. The t-test which is used for the present research is a univariate hypothesis test using t-distribution, which is used when the standard deviation is unknown and the sample size is small. As explained earlier, since the data is paired, the researcher used paired sample t-test. A similar analysis on paired data was done by the famous L C Gupta committee research (1996) into credit decisions of managers in financial institutions. In order to compute t for paired samples, the paired difference risk driver called D is

formed and the mean and variance are calculated. The degrees of freedom are n-1, where n is the number of pairs. The relevant formulae are:

H_0 : Mean = 0

H_0 : Mean ≠ 0

T_{n-1} = D - Mean / s_d / √n

For data which is collected on the nominal scale an important non-parametric, the Wilcoxin matched-pairs single ranks test, is conducted. This test analyses the differences between the paired observations, taking into account the ranks and the magnitude of differences. It computes the differences between the pairs of variables and the absolute differences. It sums up the positive and negative ranks. The test statistic z is computed from positive and negative rank sums. Under the null hypothesis of no difference, z is a standard normal variate with mean zero and variance 1 for large samples. This test corresponds to the t- test.

After selecting an appropriate test, a particular level of significance is selected. Type 1 error occurs when the sample results lead to rejection of null hypothesis which is indeed true. The probability of making Type I error is called level of significance. An intolerably high level of significance will increase Type II errors; the level of significance was therefore fixed at 5 or 0.05 per cent

After this the test statistic was calculated and the probability was determined (critical value)using the SPSS package. If the probability associated with the observed value of test statistic was less than the level of significance, the null hypothesis is rejected and *vice versa.*

4.5.1.7 Analysis of Variance: The risk sub-variables selected under each factor of the credit scoring model, which is used for attitude surveys, should be able to distinguish the critical risk drivers for the two sectors under focus, that is: road and power. Such a distinction is possible if the values for the selected risk drivers for the two groups are separated by wide enough margins, and the reading of risk drivers in the two groups does not overlap. That is, the means of distribution for each of the risk drivers for the

two sectors under focus must be far apart. The statistical test for measuring the explanatory power of risk drivers is the F test. Zmijweski (1984) conducted it for univariate models in corporate expansion and modernization projects. A statistical test for examining the differences among means for two or more populations is called as Analysis of Variances (ANOVA). Since the researcher is doing it for each of the risk sub-variable under each factor, one-way analysis of variance will be done.

The t-test conducted earlier in the previous section is done for each element of the credit score sheet as identified earlier and will help the hypothesis testing. One-way ANOVA will investigate whether any significant difference lies in each of the risk drivers under each element of the credit scoring sheet. For example, the element in management risk is defined by the five risk drivers : (*i*) Transparent shareholders' agreement; (*ii*) Track record of sponsors;(*iii*) Financial strength and Prudence of sponsors; (*iv*) Capability for equity infusion; and (*v*) Viability gap funding or government grant.

If the attitude towards risk sub-variables changes significantly from sector to sector, it will necessitate a relook at the credit appraisal and the scoring processes which are the first steps in risk measurement that are currently being used by the Indian banks. This test will identify the risk drivers about which the perception is significantly different when the officer is appraising and scoring projects under different sectors. The F-score may also point towards the most critical risk drivers under each sector.

Based on the conclusions of the study on project appraisal process, attitude survey results on risk drivers of risk scoring and practices of risk management in Indian banks, suitable suggestions and recommendations will be drawn for the banking system.

4.5.2 For research question two, in order to understand the Basel II implications for Specialised Lending, secondary research was carried out. Then using a sample of 48 project loans and the ratings from CRISIL, a five year transition matrix was created.

4.5.2.1 Creation of Transition Matrix: The transition matrix is a tool for studying rating migration of a borrower. It represents rating migration from one rating level to another within a time-frame of one year. It denotes default probability and migration of the

rated borrower to default grade. The transition matrix provides the profile of credit quality change or migration that has taken place for the selected 48 projects based on the CRISIL rating format, between any two selected years. Because the study was done on historical data, migration was noted for weighted average actual migration achieved on a year- to-year basis for the 5-year period. The mean transition matrix is a summary of how the rated accounts have migrated during the selected years and the last column of the matrix indicates probability of default which is a measure of credit risk.

The process was started by doing mortality-rate analysis of yearly cohorts of companies for at least two years to find the number of firms in each rating class, each cohorts moving towards the default category (D). Each cohort comprises all the companies which have a rating outstanding at the start of the cohort year.

Assume there are T(i,d) number of firms migrating to default category out of N(i) number of firms in the Ith rating grade over the one-year period where the I represents the rating grade at the start of the period and D represents default. The probability of default will be $T_{i}, d/N_{i}$. This is under a historic default-experience approach. Pivot (frequency) tables were created for all the rating grades and mean migration; year-to-year was calculated by multiplying $T_{i}, d /N_{i}$ with the corresponding weight of the rating class (Bandhyopadhyay, 2007).

The following objectives are yet to be completed:

4.5.3 For research question three, important ratios like interest coverage, Debt to EBIDTA will be measured for 8 companies in Infrastructure sector. These ratios will be compared with similar other groups. Balance sheets will be analyses using PROWESS data base or Capital Line.

4.5.4 For Research Question four, market data was analyzed, betas, leveraged and unleveraged will be calculated and rising cost of equity of Infrastructure firms will be calculated in stressed scenarios.

Chapter Five

A SURVEY OF CREDIT OFFICERS IN BANKS

RESULTS AND INTERPRETATION

5.1. Introduction

It is quite evident after the descriptive research that the parameters and issues involved across all sectors of infrastructure are quite different when the bankers appraise the projects. However when appraising officers assess risk, it is generally done on the same factors and sub-variables across all sectors as the scoring models are not sector specific. There are many factors on which credit officers assign scores depending on their perception. Using the same factors as used by banks in credit rating and dividing them into sub-variables based on descriptive research, an attitude survey was conducted for appraising officers. The survey focused on road and power sectors.

The survey results are divided into three sections. In section A appraising officers were asked to give their opinions on relative importance that they give to each sub-variable under identified elements of project appraisal such as management quality, market potential, and funding issues relating to technical, construction, operation, legal, and *force majeure* aspects across both road and power sectors. Through a paired sample t-test the first null hypothesis – that the attitude of credit officers towards relative importance of credit scoring variables on the overall credit score of each element of risk, as used in credit rating mechanism, is not different from sector to sector – is tested. In section B, the same methodology is used to check their perceptions on specific risk buckets and their identification across all sectors. In section C appraising officers were asked questions on their appreciation of structural issues as well as creation of security in infrastructure projects.

The target group of this survey, as explained earlier, was those officers who have appraised projects in both road and power sectors as well as traditional corporate projects.

A structured questionnaire was used, which was divided into 3 sections. A sample size of 70 credit officers was used.

This chapter directly corresponds to the sections in the questionnaire and leads to the testing of the hypotheses. Section A discusses the results of Project Appraisal; Section B concentrates on Risk Measurement; and Section C on Structural issues.

Section A

Testing of Hypothesis 1

Project Appraisal

5.2 Testing of Hypothesis One: Project Appraisal

Project appraisal can be defined as adoption of a process to enable an independent and objective assessment of the inter-relationship between technical, financial, commercial, economic, managerial, ecological and social aspects of an investment proposition for arriving at a financing decision (Balu, 2002). This entire gamut of appraisal is critical for determining the viability of a project and can help re-shape a project to enhance its viability and utility (Chandra, 2002).

The following hypothesis is used to establish the attitude of credit officers towards variables which constitute each element of a project appraisal.

5.2.1 Hypothesis One

- H0 (Null Hypothesis)= Attitude of credit officers towards relative importance of credit scoring sub-variables on the overall credit score of each element of risk, as used in credit rating mechanism, is not different from sector to sector while appraising projects in the chosen sectors of road and power.

- H1 (Alternate Hypothesis) = Attitude of credit officers towards relative importance of credit scoring sub-variables on the overall-credit score of each element of risk, as used in credit rating mechanism depends on inherent risks unique to the sector and status of a promoter.

Though each bank clearly defines the parameters on which scores are to be given, the hunch is that some amount of subjectivity may creep in, which may be the result of the sectoral issues which credit officers may feel relevant, and, therefore, the score on the same parameters may not reflect correctly on the rating, thereby affecting the pricing as well. This will happen if the same elements are used across each sector of infrastructure.

5.2.2 Hypothesis Testing

Hypothesis testing for the study is related to the differences between the means of two samples that is Credit Officers who have appraised projects in Road Sector and Power Sector. Both parametric and non-parametric tests of hypothesis are done on the collected data. The results are substantiated by Analysis of Variances.

5.2.2.1 *Management Quality:* For any credit officer, appraising management quality is of critical importance. This appraisal element is sub-divided into five distinct variables which are: (i) transparent shareholders' agreement between sponsors, (ii) track record of sponsors and experience of project team, (iii) financial prudence of sponsors, (iv) ability to infuse equity, and (v) extent of government grant. The success of an appraisal would largely depend on how well the officer has examined these variables.

The frequency distributions of the results of the two sectors are summarized in Table 5.1(A) and (B).

Table 5.1 (A): **Project Appraisal: Management Quality (Roads)**

Management Quality	Percentage of Responses within Each Rank (N=70)					
	Least Importance *1*	*2*	*3*	*4*	*Very High Importance* *5*	*Mean*
1. Transparent Shareholders' Agreement	0(0)	1.4 (1)	15.7 (11)	42.9 (30)	40.0 (28)	4.21
2. Sponsors' Track Record/Project Team	0(0)	5.7 (4)	7.1 (5)	40 (28)	47.2 (33)	4.27
3. Sponsors' Financial Prudence	0(0)	1.4 (1)	17.1 (5)	18.6 (13)	72.9 (51)	4.63
4. Infusion of Capital	8.6 (6)	37.1 (26)	30 (21)	12.9 (9)	11.4 (8)	2.81
5. Government Grant / Viability Gap Funding	5.7 (4)	32.9 (25)	50 (33)	7.1 (5)	4.3 (3)	2.71

Table 5.1 (B): **Project Appraisal: Management Quality (Power)**

Management Quality	Percentage of Responses within Each Rank (N=70)					
	Least Importance				*Very High Import*	*Mean*

	1	2	3	4	ance 5	
1. Transparent Shareholders' agreement	0(0)	4.3 (3)	5.7 (4)	11.4 (8)	78.6 (55)	4.64
2. Sponsors Track Record	0(0)	5.7 (4)	8.6 (6)	37.1 (26)	48.6 (34)	4.28
3. Sponsors Financial Prudence	0(0)	0(0)	8.6 (6)	20.0 (14)	71.4 (50)	4.65
4. Infusion of Capital /Equity	0(0)	10.0 (7)	20.0 (14)	54.3 (38)	15.7 (11)	3.76
5. Government Grant / Viability Gap Funding	0(0)	17.1 (12)	57.19 (40)	22.9 (16)	2.9 (2)	3.11

It is clear from the above results that credit officers consider financial prudence, shareholders' agreement and track record of the sponsors/project team as the most important variables in defining management quality. In both road and power sectors, the sponsor's financial prudence is of critical importance. Though the funding is essentially non-recourse in nature, they believe that sponsors being equity providers drive the functioning of SPV even though they are minority holders. Most of the projects in infrastructure sector are being taken up by strong sponsors, so equity infusion is not such a critical concern. **Although, what is of concern is the delay in equity infusion.** As government grant and viability gap funding come with various riders of compliance and many a time withdrawal is on reimbursement basis, it does not play a critical role in project appraisal.

A first glance at the above table shows that scores in the power sector across all variables are higher than that of the road sector, which is examined further by the t test.

Table 5.2: **Paired Sample t-Test (Management Quality)**

Variable	*N*		*Standard Deviation*	*Standard Error*	
Road	70		1.65	0.20	
Power	70		1.61	0.19	

Difference of Mean Road Power -1.77	Standard Deviation 2.04	Standard Error Mean 0.24	Correlation 0.220	t value -7.275	Degrees of Freedom 69	Significance (2 Tailed) at 0.05 level 0.000

The mean difference between the attitudes towards appraisal of road and power is 1.77 with a standard deviation of 2.04 and a standard error of 0.24. This results in a t value of 7.275 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers feel that management quality and strength of project team has a greater say in appraisal in power compared to road in general. The difference in attitude towards management appraisal of road and power sectors is statistically significant.

The variables selected for management appraisal should be able to distinguish appraisal of road sector from the power sector. Such a distinction is possible if the values of selected variables for the two groups are separated by a wide enough margin. The statistical test for explanatory power of variables is called as ANOVA. Analysis of variances is used as a test of means for two or more populations. The null hypothesis is of course that means are equal. One-way analysis of variable uses only one factor and therefore for each variable one-way analysis of variance is carried out. The results are summarized in Table 6.3.

Table 5.3: ANOVA Single Factor (Management Quality)

	Mean Road (N=70) df=69	*Mean Power (N=70) df=69*	*Anova Statistics*	*F value*	*F critical*	*P value at 0.05 significance level*
1. Transparent Shareholders' agreement	4.21	4.64	DF=1 MS=6.42	10.83	3.909	0.001
2. Sponsors' Track Record	4.27	4.28	DF=1 MS=0.007	0.010	3.909	0.918
3. Sponsors' Financial Prudence	4.63	4.65	DF=1 MS=0.028	0.070	3.909	0.791
4. Infusion of Capital	2.81	3.76	DF=1 MS=31.11	31.23	3.909	0.000
5. Government Grant/ Viability Gap Funding	2.71	3.11	DF=1 MS=5.6	9.05	3.909	0.003

The results at 0.05-level of significance show a significant difference in attitude across the two sectors in shareholders' agreement, infusion of capital and viability gap. However, the difference is not statistically significant with respect to strength of project

team/sponsors' track record and financial prudence. It means that appraising officers place the highest priority on track record and financial prudence of sponsors and though the raw scores are more in power than in the road sector. There is no statistical difference in approach towards the same. These two variables are independent of the sector. However, as is evident across many examples in power sector, particularly the Ultra Mega Power Project (UMPP), in Sasan case where shareholders' agreement was challenged, it is critical in power sector in comparison to roads. As power projects are generally more costly, in comparison to road projects, equity infusion and viability gap funding assume significance.

5.2.2.2 *Market Potential: Demand and Price issues*: For any bank officer, appraising market potential is of critical importance. Market potential is further sub-divided into demand issues and price issues. As far as the demand is concerned, there are two types of projects, (a) where there are single or identifiable buyers, for example in power, water supply, etc; (b) where there may be numerous buyers, for example toll roads, airports or telecom, etc. Similarly, with regard to price, there are some projects in which charges are predefined by the government, for example roads; others where the charges are predefined by the bidder, for example power and water, and still others where charges are predefined by the regulator, for example airports. These elements are further sub-divided into five distinct variables for our survey. The frequency distributions of results of two sectors are summarized in Table 6.4 (A) and (B).

***Table 5.4 (A)* : Project Appraisal: Market Potential, Demand Issues (Roads)**

Market Potential *Demand Issues*	*Percentage of Responses within Each Rank (N=70)*					
	Least Importance *1*	*2*	*3*	*4*	*Very High Importance* *5*	*Mean*
1. Single or Multiple Buyer	0(0)	5.7 (4)	48.6 (34)	44.3 (31)	1.4 (1)	3.41

	1	2	3	4	5	Mean
2. Contractual agreement with the buyer	0(0)	21.41(5)	77.1 (54)	1.4 (1)	0(0)	2.80
3. Long term demand supply gap	0(0)	1.4 (1)	85.7 (60)	12.9 (9)	0(0)	3.11
4. Competition from new entrants/ alternate facilities	0(0)	8.6 (6)	64.3 (45)	27.1 (19)	0(0)	3.19
5. Cyclicality/ Recession in general economy	0(0)	11.4 (8)	84.3 (59)	4.3 (3)	0(0)	2.93

Table5.4 (B) : **Project Appraisal: Market Potential, Demand Issues (Power)**

Market Potential *Demand Issues*	*Percentage of Responses within each rank (N=70)*					
	Least Importance *1*	*2*	*3*	*4*	*Very High Importance* *5*	*Mean*
1. Single or Multiple Buyer	0(0)	4.3 (3)	24.3 (17)	71.4 (50)	0(0)	3.67
2. Contractual agreement with the buyer	0(0)	0(0)	21.4 (15)	35.7 (25)	42.9 (30)	4.21
3.Long term demand supply gap	0(0)	7.1 (5)	22.9 (16)	70 (49)	0(0)	3.63
4.Competition from new entrants/ alternate facilities	0(0)	17.1 (12)	61.4 (43)	15.7 (11)	5.7 (4)	3.10
5.Cyclicality/ Recession in general	0(0)	5.7	22.9	71.4	0(0)	3.66

economy		(4)	(16)	(50)	

It is clear from the above results that credit officers consider single or multiple buyers as the most important factors in deciding demand issues in roads. It means that, apart from annuity projects, road projects generally involve collection of toll. As toll is fixed by the government agency, it means that success of a project is largely dependant on the toll collected which is linked to traffic. Traffic forecasts are generally done by traffic consultants based on various parameters. In the case of power, the single buyer would be a State Electricity Board and multiple buyers may involve contingent buyers like Power Trading Corporations. Of course contractual agreement with the buyers like the power purchase agreement becomes critically important in the case of power projects. This is actually insignificant in the case of roads.

A glance at the table shows that scores in the power sector across all variables are higher than that of the road sector, which is examined further by the t test in Table 5.5.

Table 5.5 : **Paired Sample t-Test (Market Potential, Demand Issues)**

Variable	*N*	*Standard Deviation*	*Standard Error*
Road	70	1.26	0.15
Power	70	1.83	0.21

Difference of Mean Road - Power - 2.84	Standard Deviation 2.3445	Standard Error Mean 0.2802	Correlation 0.113	t -test -10.145	Degrees of Freedom 69	Significance (2 Tailed) at 0.05 level 0.000

The mean difference between the attitudes towards appraisal of roads and power is 2.84 with a standard deviation of 2.34 and a standard error of 0.28. This results in a t-value

of 10.145 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers feel that in general demand has a greater say in appraisal in the power sector compared to the road sector. The difference in attitude towards demand appraisal of road and power sectors is statistically significant.

One-way analysis of variable uses only one factor and therefore for each variable one-way analysis of variance is carried out. The results are summarized in Table 5.6.

Table 5.6 : **ANOVA Single Factor (Market Potential, Demand Issues)**

Market Potential Demand Issues	*Mean Road (N=70) do=69*	*Mean Power (N=70) do=69*	*ANOVA statistics*	*F value*	*F critical one tail*	*P value at 0.05 significance level*
1 Single or Multiple Buyer	3.41	3.67	DF=1 MS=2.314	6.59	3.909	0.011
2.Contractual agreement with the buyer	2.80	4.21	DF=1 MS=70.00	175.66	3.909	0.000
3.Long-term demand supply gap	3.11	3.63	DF=1 MS=9.25	36.05	3.909	0.000
4.Competition from new entrants/ alternate facilities	3.19	3.10	DF=1 MS=0.25	0.58	3.909	0.446
5.Cyclicality/ Recession in general economy	2.93	3.66	DF=1 MS=18.5	74.49	3.909	0.000

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The results at 0.05-level of significance show a significant difference in attitude across the two sectors in all variables except competition from new entrants and alternate facilities. This may be because competition would impact all sectors.

5.2.2.2.1 *Pricing issues***:** Pricing issues are summarized in Tables 5.7 (A) & (b).

*Table 5.7 (A)***: Project Appraisal: Market Potential, Price Issues (Roads)**

Market Potential *Price Issues*	**Percentage of Responses within Each Rank (N=70)**					
	Least Importance *1*	*2*	*3*	*4*	*Very High Importance 5*	*Mean*
1.Charges predefined by Govt/ Bidder	1.4 (1)	28.6 (20)	61.4 (43)	8.6 (6)	0 (0)	2.77
2.Bids Servicing Costs	0 (0)	32.9 (23)	51.4 (36)	15.7 (11)	0 (0)	2.83
3.Off take, Demand Driven, Take or Pay	4.3 (3)	12.9 (9)	65.7 (46)	10 (7)	7.1 (5)	3.03
4.Charges economical for the off taker	2.9 (2)	14.3 (10)	64.3 (45)	11.4 (8)	7.1 (5)	3.06
5. Level of Competition	0 (0)	8.6 (6)	11.4 (8)	62.9 (44)	17.1 (12)	2.89

Table 5.7 (B) **: Project Appraisal: Market Potential, Price Issues (Power)**

Market Potential	*Percentage of Responses within Each Rank (N=70)*

Price Issues	Least Importance 1	2	3	4	Very High Importance 5	Mean
1. Charges predefined by Government/Bidder	1.4 (1)	2.9 (2)	5.7 (4)	21.4 (15)	68.6 (48)	4.53
2.Bids Servicing Costs			1.4 (1)	25.7 (18)	72.9 (51)	4.71
3.Off take, Demand Driven, Take or Pay			7.1 (5)	22.9 (16)	70 (49)	4.63
4. Charges Economical for the off- taker			7.1 (5)	28.6 (20)	64.3 (45)	4.57
5. Level of Competition	8.6 (6)	35.7 (25)	32.9 (23)	15.7 (11)	7.1 (5)	2.77

It is evident from the above table that pricing issues are more critical in the power sector rather than the road sector. This may be because in most of the road projects, toll rates are regulated by the government agency. So, in the case of roads, whether the charges are economical or not for the off-taker are quite critical, which, in other words mean, whether there will be willingness to use the toll-road. Other critical issue would be escalation of toll rates. In the case of power, particularly now, when most of the power projects are on bid, the price or the rate at which the generating company will supply power and whether the bid will service the costs is critical. Also important in the case of power is whether the off-taking party (State Electricity Board) has the escrowable capacity to pay. Most of the state

electricity boards are poorly rated and may have poor escrowable capacity only. The results are further analysed through the t-test (Table 5.8).

Table 5.8 : Paired Sample t-Test (Market Potential, Price Issues)

Variable	N	Standard Deviation	Standard Error
Road	70	1.67	0.20
Power	70	1.87	0.22

Difference of Mean Road - Power	Standard Deviation	Standard Error Mean	Correlation	t Value	Degrees of Freedom	Significance (2 Tailed) at 0.05 level
- 5.64	2.7454	0.3281	- 0.012	-17.19	69	0.000

The mean difference between the attitudes towards appraisal of roads and power is 5.64 with a standard deviation of 2.7454 and a standard error of 0.3281. This results in a t-value of 17.19 with 69 degrees of freedom and a probability (2-tailed) of less than 0.005. Therefore, bankers feel that price issues have a greater say in the appraisal in power compared to road sector in general. In fact, so steep is the difference that even factors are slightly negatively correlated indicating that attitude of bankers towards factors of pricing of infrastructure services, which is a key input to cash-flows modeling done by the borrower are quite divergent depending on the sector being appraised. Further, factor-wise analysis carried out by ANOVA test is given in Table 5.9.

Table 5.9 : ANOVA Single Factor (Market Potential, Price Issues)

Market Potential Price Issues	Mean Road (N=70) df=69	Mean Power (N=70) df=69	ANOVA Statistics	F value	F critical	P value at 0.05 level
1.Charges Predefined	2.77	4.53	DF=1	196.77	3.909	0.000

by government/bidder			MS=108.06			
2. Bids Servicing Costs	2.83	4.71	DF=1 MS=124.45	356.11	3.909	0.000
3. Off take, Demand Driven, Take or Pay	3.03	4.63	DF=1 MS=89.60	166.44	3.909	0.000
4. Charges economical for the off taker	3.06	4.57	DF=1 MS=80.25	151.89	3.909	0.000
5. Level of competition	3.89	2.77	DF=1 MS=43.45	50.21	3.909	0.000

The one-way ANOVA results show that differences in attitude towards pricing issues of road and power sectors are statistically significant across all variables.

5.2.2.3 *Technical Issues*: For infrastructure projects technical issues are of critical importance. The appraising officer has to appraise availability and appropriateness of technology, the reputation of equipment suppliers and basis of selection, the terms of supply *vis-a-vis* the scope and liquidated damages, adequacy of raw material and implementation schedule with regard to feasibility and single-point responsibility.

Table 5.10 (A) : **Project Appraisal: Technical Issues (Roads)**

	Percentage of Responses within Each Rank (N=70)					
Technological Issues	*Least Importance* *1*	*2*	*3*	*4*	*Very High Importance* *5*	*Mean*

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1. Land Acquisition /R & R	7.1 (5)	60 (42)	20 (14)	10 (7)	2.9 (2)	2.41
2. Clearance from MoEF/PCB/ Others	1.4(1)	5.7 (4)	65.7 (46)	17.1 (12)	10 (7)	3.29
3. LIE opinion on aggressiveness	1.4(1)	4.3 (3)	25.7 (18)	64.3 (45)	4.3 (3)	3.66
4. Technology and Operational risk issues		17.1 (12)	17.1 (12)	52.9 (37)	12.9 (9)	3.61
5. Testing and Commissioning Risks	8.6 (6)	54.3 (38)	18.6 (13)	14.3 (10)	4.3 (3)	2.51

Table 5.10 (B) : **Project Appraisal: Technical Issues (Power)**

	Percentage of Responses within Each Rank (N=70)					
Technological Issues	*Least Importance* *1*	*2*	*3*	*4*	*Very High Importance* *5*	*Mean*
1. Land Acquisition /R & R	2.9 (2)	5.7 (4)	22.9 (16)	60 (42)	8.6 (6)	3.66
2.Clearance from MoEF/PCB/ etc.			5.7 (4)	30 (21)	64.3 (45)	4.59
3. LIE Opinion on Aggressiveness	1.4 (1)	2.9 (2)	24.3 (17)	54.3 (38)	17.1 (12)	3.83

| 4.Technology and Operational risk issues | | | 5.7 (4) | 35.7 (25) | 58.6 (41) | 4.53 |
| 5. Testing and Commissioning Risks | 2.9 (2) | 2.9 (2) | 14.3 (10) | 11.4 (8) | 68.6 (48) | 4.40 |

It is evident that though land acquisition plays a very small role in road projects; they are important in case utilities are not tied up in power projects. They are even more critical in storage-type hydro projects where displacement is a common problem. Clearances from Ministry of Environment and Finance (MoEF) and Pollution Control Board (PCB) are critical for power sector, particularly for coal-fired thermal plants as they produce fly ash which is a big pollutant and has to be dumped in land fills. Most of the projects are vetted by the lenders' independent engineer who plays an important role. In case the estimates of the borrower are different from those estimated by LIE, the appraising officer needs to further investigate. Technology and operational risks are definitely more crucial to power, as in many projects, bidding is done based on the strength of super-critical technologies and the manner in which they improve the peak load factor. For the power purchase agreement to come into force, many a time testing and commissioning clauses need to be validated and are crucial. The results are further analysed by the t-test (Table 5.11).

Table 5.11 : **Paired Sample T-Test (Technical Issues)**

Variable	*N*	*Standard Deviation*	*Standard Error*			
Road	*70*	*1.93*	*0.23*			
Power	*70*	*1.82*	*0.22*			
Difference of Mean- Road and Power - 5.51	Standard Deviation 2.43	Standard Error Mean 0.29	Correlation 0.161	t-Test -18.985	Degrees of Freedom 69	Significance (2 Tailed) at 0.05 level 0.000

The mean difference between the attitudes towards appraisal of roads and power is 5.51 with a standard deviation of 2.43 and a standard error of 0.29. This results in a t-value of 18.98 with 69 degrees of freedom and a probability (2-tailed) of less than 0.005. Therefore, bankers feel that technological issues have a greater say in appraisal in power compared to the road sector in general. Factor by factor analysis is further carried out by analysis of variances.

Table 5.12: **ANOVA Single Factor (Technical Issues)**

Technical Issues	*Mean Road (N=70) df=69*	*Mean Power (N=70) df=69*	*ANOVA Statistics*	*F value*	*F critical*	*P value at 0.05 level*
1. Land Acquisition/ R & R	2.41	3.66	DF=1 MS=54.06	74.04	3.909	0.000
2. Clearance from MoEF/PCB/ Others	3.29	4.59	DF=1 MS=59.15	121.33	3.909	0.000
3. LIE opinion on aggressiveness	3.66	3.83	DF=1 MS=1.02	1.82	3.909	0.178
4. Technology and Operational risk issues	3.61	4.53	DF=1 MS=29.25	48.04	3.909	0.000
5. Testing and Commissioning Risks	2.51	4.40	DF=1 MS=124.45	122.42	3.909	0.000

Except for vetting by lender's independent engineer, the appraising officer's attitude towards all the variables used for technological appraisal in road and power sectors are significantly different**.**

5.2.2.4 *Construction Issues***:** Construction should be completed without time and cost overruns so that the project can start operations as per the scheduled commencement date,

which is quite critical to the success of any infrastructure project. The frequency distribution is given in Tables 5.13 (A) and (B).

Table 5.13 (A) : Project Appraisal : Construction Issues (Roads)

Construction Issues	Percentage of Responses within Each Rank (N=70)					
	Least Importance 1	2	3	4	Very High Importance 5	Mean
1.Fixed Time, Fixed Price All Inclusive EPC Contract		2.9 (2)	44.3 (31)	42.9 (30)	10 (7)	3.60
2.Liquidated Damages/ Defects Liability			20 (14)	74.3 (52)	5.7 (4)	3.86
3.Parent Company Guarantees	7.1 (5)	68.6 (48)	14.3 (10)	1.4 (1)	8.6 (6)	2.36
4.Reasonability of EPC Contract Price			37.1 (26)	54.3 (38)	8.6 (6)	3.71
5.Benchmarking under Similar Contracts	1.4 (1)		27.1 (19)	67.1 (47)	4.3 (3)	3.73

Table 5.13 (B) : Project Appraisal: Construction Issues (Power)

Construction Issues	Percentage of Responses within Each Rank (N=70)					
	Least Importance 1	2	3	4	Very High Importance 5	Mean
1. Fixed Time, Fixed Price All Inclusive EPC Contract	1.4 (1)	1.4 (1)	17.1 (12)	31.4 (22)	48.6 (34)	4.24

2. Liquidated Damages/ Defects Liability	1.4 (1)	8.6 (6)	20 (14)	47.1 (33)	22.9 (16)	3.81
3. Parent Company Guarantees		7.1 (5)	21.4 (15)	27.1 (19)	44.3 (31)	4.09
4. Reasonability of EPC Contract Price		1.4 (1)	8.6 (6)	20 (14)	70 (49)	4.59
5. Benchmarking under Similar Contracts	2.9 (2)	1.4 (1)	11.4 (8)	22.9 (16)	61.4 (43)	4.39

It is evident that all the factors are fairly important in construction issues. A fixed-time fixed-price EPC contract with adequate liquidated damages is a protection against time overrun. However, in many cases the liquidated damages are capped at 20 per cent of the project cost. The EPC price has to be vetted and benchmarked because in many cases its percentage is the highest in the total project cost. Parent company guarantees are quite critical, particularly in times of restructuring. The results are further analysed through the t-test (Table 6.14).

Table 5.14 : **Paired Sample t-Test (Construction Issues)**

Variable	N	Standard Deviation	Standard Error
Road	70	1.59	0.19
Power	70	2.04	0.24

Difference of Mean Road Power - 3.86	Standard Deviation 2.41	Standard Error Mean 0.29	Correlation 0.138	t-Test -13.39	Degrees of Freedom 69	Significance (2-Tailed) at 0.05 level 0.000

The mean difference between the attitudes towards appraisal of road and power is 3.86 with a standard deviation of 2.41 and a standard error of 0.29. This results in a t-value of 13.39 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers feel that construction issues have a greater say in appraisal in power compared to the road sector in general. The difference in attitude towards construction issues of road and power sectors is statistically significant. Case by case analysis is carried out through analysis of variances (Table 6.15).

Table 5.15 : ANOVA Single Factor (Construction Issues)

Construction Issue	Mean Road (N=70) df=69	Mean Power (N=70) df=69	ANOVA Statistics	F value	F critical	P value at 0.05 level
1. Fixed Time, Fixed Price All Inclusive EPC Contract	3.60	4.24	DF=1 MS=14.46	22.25	3.909	0.000
2. Liquidated Damages/ Defects Liability	3.86	3.81	DF=1 MS=0.064	0.11	3.909	0.735
3. Parent Company Guarantees	2.36	4.09	DF=1 MS=104.57	111.39	3.909	0.000
4. Reasonability of EPC contract price	3.71	4.59	DF=1 MS=26.57	59.86	3.909	0.000
5. Benchmarking under similar contracts	3.73	4.39	DF=1 MS=15.11	23.58	3.909	0.000

Apart from liquidated damages/defects liability, which in the opinion of officers affects both sectors equally, the attitude towards other variables which constitute construction issues differs from sector to sector. Also in Power sector now a days, instead of EPC contract, the companies give Boiler Turbine Generator (BTG) contract or Balance of Plant (BOP) contract.

5.2.2.5. *Operational Issues:* A good operations and maintenance contract will ensure sustainability of cash flows. It would mean an adequate level of service and maintenance requirements, track record and experience of operations and maintenance (O&M), pricing for O&M, availability of inputs and events of default. The frequency distributions are given in Table 5.16 (A) and (B).

Table 5.16 (A): Project Appraisal : Operational Issues (Roads)

	Percentage of Responses within Each Rank (N=70)					
Operational Issues	Least Importance 1	2	3	4	Very High Importance 5	Mean
1. Pricing of Operations and Management Contract			21.4 (15)	58.6 (41)	20 (14)	3.99
2. Track Record of O & M Contractor			22.9 (16)	77.1 (54)		3.77
3. Defining Events of Default	1.4 (1)	2.9 (2)	4.3 (3)	18.6 (13)	72.9 (51)	4.59
4. Input Linkages		8.6 (6)	88.6 (62)	2.8 (2)		2.94
5. Termination/Quick Replacement in Case of Suboptimal Performance		17.1 (12)	51.4 (36)	31.4 (22)		3.14

Table 5.16 (B) : Project Appraisal: Operational Issues (Power)

	Percentage of Responses within Each Rank (N=70)					
Operational Issues	Least Importance 1	2	3	4	Very High Importance 5	Mean

1. Pricing of Operations and Management Contract	1.4 (1)	2.9 (2)	8.6 (6)	34.3 (24)	52.9 (37)	4.34
2. Track Record of O & M Contractor	1.4 (1)	1.4 (1)	21.4 (15)	60 (42)	15.7 (11)	3.87
3. Defining Events of Default		1.4 (1)	12.9 (9)	24.3 (17)	61.4 (43)	4.46
4. Input Linkages		1.4 (1)	4.3 (3)	10 (7)	84.3 (59)	4.77
5. Termination/Quick Replacement in case of suboptimal performance		7.1 (5)	25.7 (18)	65.7 (46)	1.4 (1)	3.61

Pricing of operations and management contract is critical in roads and power sectors since the efficiency of the project depends on it. It is a major element in cost of the project and under or overpricing will affect efficiencies. Track record of O&M contractor is important particularly in road, as pilferages may hurt the cash flow of the project. Defining the event of default is quite critical as the water-fall mechanism used in collection will get affected by inappropriate description. Input linkages are extremely critical in power as many power projects face delay in commissioning as inputs like coal, gas, etc., is not properly tied up. Termination is not such an important issue since it usually invites legal action. The results are further analysed through the t- test. (Table 5.17)

Table 5.17 : **Paired Sample t -Test (Operational Issues)**

Variable	*N*	*Standard Deviation*	*Standard Error*
Road	70	1.40	0.16
Power	70	1.55	0.18

Difference of Mean	Standard Deviation	Standard Error Mean	Correlation	T Test	Degrees of Freedom	Significance (2 Tailed) at 0.05 level
Road - Power - 2.62	2.03	0.24	0.055	-10.79	69	0.000

The mean difference between the attitudes towards appraisal of roads and power is 2.62 with a standard deviation of 2.03 and a standard error of 0.24. This results in a t-value of 10.79 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers feel that operational issues have a greater say in the appraisal of power project compared to the road sector in general. The difference in attitude towards operational issues of road and power sectors is statistically significant. Case by case analysis is carried out through analysis of variances (Table 5.18).

Table 5.18 : ANOVA Single Factor (Operational Issues)

Operational Issues	*Mean Road (N=70) do=69*	*Mean Power (N=70) df=69*	*ANOVA Statistics*	*F value*	*F critical*	*P value at 0.05 level*
1.Pricing of Operations and management contract	3.99	*4.34*	DF=1 MS=4.46	7.62	3.909	0.006
2. Track Record of O&M Contractor	3.77	*3.87*	DF=1 MS=0.35	0.96	3.909	0.328
3. Defining Events of Default	4.59	*4.46*	DF=1 MS=0.573	0.903	3.909	0.343
4. Input Linkages	2.94	*4.77*	DF=1	502.88	3.909	0.000

			MS=117.0 2				
5. Termination/Quick Replacement in case of Suboptimal Performance	3.14	3.61	DF=1 MS=7.77	17.55	3.909	0.000	

It is quite evident that apart from the track record of O&M contractor and events of default which are considered in every appraisal, credit officers feel that the rest of the issues like pricing, input linkages and termination are sector specific and therefore the differences are statistically significant.

5.2.2.6 *Legal Issues***:** In the light of various project parties, contracts and agreements described earlier, legal issues are an important part of appraisal of infrastructure projects. The results of the survey are summarized in Tables 5.19 (A) and (B).

Table 5.19 (A) **: Project Appraisal : Legal   Issues (Roads)**

	Percentage of Responses within Each Rank (N=70)					
Legal Issues	*Least Importance* *1*	*2*	*3*	*4*	*Very High Importance* *5*	*Mean*
1.Charter of SPE		2.9 (2)	80 (56)	15.7 (11)	1.4 (1)	3.16
2.Trustee and Inter-creditor arrangements		25.7 (18)	58.6 (41)	7.1 (5)	8.6 (6)	2.99
3.Enforceability of Rights and Remedies			8.6 (6)	30 (21)	61.4 (43)	4.53

Legal Issues	1	2	3	4	5	Mean
4. Legal Opinion on Documentation and taxation		24.3 (17)	41.4 (29)	21.4 (15)	12.9 (9)	3.23
5. Dispute Redressal	1.4 (1)	12.9 (9)	64.3 (45)	18.6 (13)	2.9 (2)	3.09

Table 5.19 (B) : Project Appraisal : Legal   Issues (Power)

Legal Issues	Percentage of Responses within each rank (N=70)					Mean
	Least Importance 1	2	3	4	Very High Importance (5)	
1. Charter of SPE		4.3 (3)	21.4 (15)	70 (49)	4.3 (3)	3.74
2. Trustee and Intercreditor arrangements	1.4 (1)	1.4 (1)	12.9 (9)	58.6 (41)	25.7 (18)	4.06
3. Enforceability of rights and remedies		2.9 (2)	7.1 (5)	18.6 (13)	71.4 (50)	4.59
4. Legal opinion of documentation and taxation			17.1 (12)	78.6 (55)	4.3 (3)	3.87
5. Dispute redressal		2.9 (2)	14.3 (10)	80 (56)	2.9 (2)	3.83

It is quite evident that enforceability of rights and remedies remains the most critical issue in the minds of the bank manager and receives high scores. Most of the issues like charter of SPV, inter-creditor issues and dispute redressal are also important. Many a projects do not reach financial closure or takes a very long time to achieve financial closure

as one or the other documentary issue is left to be cleared. The results are further analysed by the paired sample t- test.

Table 5.20: Paired Sample t - Test (Legal Issues)

Variable	N	Standard Deviation	Standard Error				
Road	70	1.92	0.23				
Power	70	1.76	0.21				
Difference of Mean Road - Power - 3.10	Standard Deviation 2.23	Standard Error Mean 0.27	Correlation 0.270	t-Test -11.64	Degrees of Freedom 69	Significance (2-Tailed) at 0.05 level 0.000	

The mean difference between the attitudes towards appraisal of road and power sectors is 3.10 with a standard deviation of 2.23 and a standard error of 0.27. This results in a t-value of 11.64 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers feel that legal issues have a greater say in the appraisal of power sector compared to road infrastructure in general. The difference in attitude towards legal issues of road and power sector is statistically significant. Case by case analysis is carried out through analysis of variances (Table 5.21).

Table 5.21: ANOVA Single Factor (Legal Issues)

Legal Issues	Mean Road (N=70) df=69	Mean Power (N=70) df=69	ANOVA Statistics	F value	F critical	P value at 0.05 level
1.Charter of SPE	3.16	3.74	DF=1 MS=12.00	40.7	3.909	0.000

2.Trustee and Inter-creditor Arrangements	2.99	4.06	DF=1 MS=40.17	63.90	3.909	0.000
3.Enforceability of rights and remedies	4.53	4.59	DF=1 MS=0.114	0.230	3.909	0.631
4.Legal opinion of Documentation and taxation	3.23	3.87	DF=1 MS=14.46	25.52	3.909	0.000
5.Dispute redressal	3.09	3.83	DF=1 MS=19.31	51.82	3.909	0.000

It is quite clear that differences of opinion on the relative importance of all factors towards legal appraisal are statistically significant, except in the case of enforceability of rights and remedies.

5.2.2.7 Force Majeure *Issues*: In any infrastructure project appraisal there can be political and non-political *force majeure* issues. Many a time the compensation that ensues to a banker is clearly specified. The results are summarized in Table 6.22 (A) and (B).

Table 5.22 (A) **: Project Appraisal: Force Majeure Issues (Roads)**

	Percentage of Responses within each rank (N=70)					
Force Majeure Issues	*Least Importance* *1*	*2*	*3*	*4*	*Very High Importance* *5*	*Mean*
1.Identification of *Force Majeure* Issues			8.6 (6)	34.3 (24)	56.1 (40)	4.49

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2.Sufficient Insurance Coverage to Prevent Default	2.9 (2)	24.3 (17)	67.1 (47)	4.3 (3)	1.4 (1)	2.77
3.Enforceability of Contract Termination	2.9 (2)	64.3 (45)	28.6 (20)	4.3 (3)		2.34
4.Coverage of Supply Default		28.6 (20)	31.4 (22)	30 (21)	10 (7)	3.21
5.Termination Benefits	4.3 (3)	61.4 (43)		21.4(15)	12.9 (9)	2.56

Table 5.22 (B): **Project Appraisal:** *Force Majeure* **Issues (Power)**

Force Majeure Issues	Percentage of Responses within Each Rank (N=70)					
	Least Importance *1*	*2*	*3*	*4*	*Very High Importance* *5*	*Mean*
1.Identification of *Force Majeure* Issues	1.4 (1)	7.1 (5)	20.0 (14)	54.3 (38)	17.1 (12)	3.79
2. Sufficient Insurance Coverage to Prevent Default		1.4 (1)	5.7 (4)	25.7 (18)	67.1 (47)	4.59
3. Enforceability of Contract Termination	4.3 (3)	20 (14)	61.4 (43)	14.3 (10)		2.86
4.Coverage of Supply Default			8.6 (6)	35.7 (25)	55.7 (39)	4.47
5.Termination Benefits			5.7 (4)	51.4 (36)	42.9 (30)	4.37

It is quite evident that high insurance coverage is an important issue apart from termination benefits which are critical to the banker. The results are further analysed through the paired sample t-test.

Table 5.23 : **Paired Sample t - Test (Force Majeure Issues)**

Variable	*N*	*Standard Deviation*	*Standard Error*			
Road	70	1.75	0.21			
Power	70	1.84	0.22			
Difference of Mean Road - Power - 4.70	Standard Deviation 2.10	Standard Error Mean 0.25	Correlation 0.319	T Test -18.71	Degrees of Freedom 69	Significance (2-Tailed) at 0.05 level 0.000

The mean difference between the attitudes towards appraisal of roads and power sectors is 4.70 with a standard deviation of 2.10 and a standard error of 0.25. This results in a t-value of 18.71 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers feel that *force majeure* issues have a greater say in appraisal in power project compared to road sector in general. The difference in attitude towards *force majeure* issues of road and power sectors is statistically significant. Case by case analysis is carried out through analysis of variances (Table 6.24).

Table 5.24: **ANOVA Single Factor (Force Majeure Issues)**

	Mean Road (N=70) df=69	*Mean Power (N=70) df=69*	*ANOVA Statistics*	*F value*	*F critical*	*P value at 0.05 level*
Force Majeure Issues						

1. Identification of *Force Majeure* Issues	4.49	3.79	DF=1 MS=17.15	29.12	3.909	0.000
2. Sufficient Insurance Coverage to Prevent Default	2.77	4.59	DF=1 MS=115.20	267.97	3.909	0.000
3. Enforceability of Contract Termination	2.34	2.86	DF=1 MS=9.25	21.17	3.909	0.000
4. Coverage of Supply Default	3.21	4.47	DF=1 MS=55.31	80.15	3.909	0.000
5. Termination Benefits	2.56	4.37	DF=1 MS=115.20	156.46	3.909	0.000

Since most of the issues under this head are governed by sector specific norms, it is quite clear that differences are statistically significant for all of them.

5.2.2.8 *Funding Issues*: From the bankers' point of view, funding is the most critical issue which is summarized below in Tables 5.25 (A) and (B).

Table 5.25 (A) **: Project Appraisal: Funding Issues (Roads)**

	Percentage of Responses within Each Rank (N=70)					
Funding Issues	*Least Importance* *1*	*2*	*3*	*4*	*Very High Importance* *5*	*Mean*

1. Equity Commitment and Strength of Sponsors		12.9 (9)	27.1 (19)	44.3 (31)	15.7 (11)	3.63
2. Stability of Cash Flows				37.1 (26)	62.9 (44)	4.63
3. Tenor of Loans	1.4 (1)	25.7 (18)	64.3 (45)	5.7 (4)	2.9 (2)	2.83
4. Reasonableness of Capital Costs	1.4 (1)	17.1 (12)	7.1 (5)	48.6 (34)	25.7 (18)	3.80
5. Viability and Bankability of Projects			12.9 (9)	50 (35)	37.1 (26)	4.24

In the road sector, the tenor of loans is not as critical as it is dependant on the duration of the concession period which is not in the hands of bankers. They do however try to build a cushion.

Table 5.25 (B): **Project Appraisal: Funding Issues (Power)**

	Percentage of Responses within each rank (N=70)					
Funding Issues	*Least Importance 1*	*2*	*3*	*4*	*Very High Importance 5*	*Mean*
1. Equity Commitment and Strength of Sponsors			4.3 (3)	52.9 (37)	42.9 (30)	4.39
2. Stability of Cash Flows			4.3 (3)	41.4 (29)	54.3 (38)	4.50
3. Tenor of Loans			10.0 (7)	37.1 (26)	52.9 (37)	4.43
4. Reasonableness of Capital		1.4	12.9	31.4	54.3	4.39

Costs		(1)	(9)	(22)	(38)	
5. Viability and Bankability of Projects		1.4 (1)	27.1 (19)	48.6 (34)	22.9 (16)	3.93

In the power sector many a time viability and bankability are ensured before bidding is invited, so this does not play such a critical role. The results of survey on some of the critical ratios used in appraisal are given in Table 6.26 (A) and (B).

Table 5.26 (A) **: Project Appraisal: Funding Issues, Ratios (Roads)**

Funding Issues, Ratios	*Values*				
	<5%	5-10%	10-15%	>15%	Mean
1. Internal Rate of Return	1	4	8	57	>15%
	<15%	15-30%	30-45%	>45%	Mean
2. EBITDA Margins		5	50	15	30-45%
	1-1.5	1.5-2.0	2-2.5	>2.5	Mean
3. Debt Equity Ratio	1	4	11	54	>2.5
	<1	1-1.5	1.5-2.0	>2.0	Mean
4. Debt Service Coverage Ratio		32	26	12	1.5-2.0
	<1	1-1.25	1.25-1.50	>1.50	Mean
5. Fixed Asset Coverage Ratio	14	52	1	3	1-1.25
6. Minimum Promoters' Contribution	<10%	10-15%	15-20%	>20%	Mean
		33	37		15-20%
1. Total Outside Liabilities to Tangible Networth	<1	1-1.50	1.5-2	>2	Mean
		29	28	13	1.5-2

Table 5.26 (B) : Project Appraisal : Funding Issues, Ratios (Power)

Funding Issues, Ratios	Values				
1. Internal Rate of Return	<5%	5-10%	10-15%	>15%	Mean
			9	61	>15%
2. EBITDA Margins	<15%	15-30%	30-45%	>45%	Mean
		2	16	52	>45%
3. Debt Equity Ratios	1-1.5	1.5-2.0	2-2.5	>2.5	Mean
		13	56	1	2-2.5
4. Debt Service Coverage Ratio	<1	1-1.5	1.5-2.0	>2.0	Mean
		12	51	7	1.5-2.0
5. Fixed Asset Coverage Ratio	<1	1-1.25	1.25-1.50	>1.50	Mean
		2	12	56	>1.50
6. Minimum Promoters Contribution	<10%	10-15%	15-20%	>20%	Mean
			9	61	15-20%
7. Total Outside Liabilities to Tangible Networth	<1	1-1.50	1.5-2	>2	Mean
		6	58	6	1.5-2

Most of the ratios are in the range which is quite different from the ones traditionally considered as "ideal". The results are further analysed in the next chapter. Paired sample t-test is used for testing the hypothesis.

Table 5.27 : Paired Sample T - Test (Funding Issues)

Variable	N	Standard Deviation	Standard Error
Road	70	1.65	0.20

Power	70	1.75	0.21	

Difference of Mean	Standard Deviation	Standard Error Mean	Correlation	T Test	Degrees of Freedom	Significance (2-Tailed) at 0.05 level
Road - Power - 2.50	2.19	0.26	0.162	-9.543	69	0.000

The mean difference between the attitudes towards appraisal of road and power sectors is 2.50 with a standard deviation of 2.19 and a standard error of 0.26. This results in a t-value of 9.543 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers feel that funding issues have a greater say in appraisal of power sector compared to road project in general. The difference in attitude towards funding issues of road and power sectors is statistically significant. Case by case analysis is carried out through analysis of variances (Table 6.28).

Table 5.28 : ANOVA Single Factor (Funding Issues)

Funding Issues	*Mean Road (N=70) df=69*	*Mean Power (N=70) df=69*	ANOVA Statistics	*F value*	*F critical*	*P value at 0.05 level*
1. Equity Commitment and Strength of Sponsors	3.63	4.39	DF=1 MS=20.06	35.08	3.909	0.000
2 .Stability of Cash Flows	4.63	4.50	DF=1 MS=0.57	2.00	3.909	0.159
3.Tenor of Loans	2.83	4.43	DF=1	196	3.909	0.000

			MS=89.6						
4. Reasonableness of Capital Costs	3.80	4.39	DF=1 MS=0.114	0.230	3.909	0.631			
5. Viability and Bankability of Projects	4.24	3.93	DF=1 MS=3.45	6.86	3.909	0.090			

It is quite clear that except for equity commitment (road projects being small in nature, equity commitment issues are quite different from that of power) and tenor of loans (road tenors being fixed by concession agreement and power projects being fixed generally on long-term BOO basis) the differences in approach towards rest of the issues are not statistically significant.

Section B

Risk Measurement

5.3. Testing of Hypothesis 1: Risk Measurement

In the earlier section we have seen that there is a statistically significant difference in the attitude of appraising officers towards all elements of the project appraisal used for road and power sectors. The obvious question is : Does it also relate to significant differences in their attitude towards identifying risks in each sector based on each element of appraisal?

Each element of appraisal described above gives rise to an element of risk. In order to consolidate the results, the data which was collected on nominal scale was analysed using an important non-parametric test called the Wilcoxin Matched Pairs Signed Ranks test. For this a significance level of 0.05 was used.

Table 5. 29 : **Wilcoxin Matched Pairs test for risk elements**

	Development or bid risk	Equity partners related	Promoters' Risk	Financing/Funding	Time overrun risk	Cost overrun	Price risk	External Parties Risk	Input Related Risk

		risk		Risk	risk				
Z score	-6.804	-7.184	-0.964	-7.143	-7.208	-7.320	-7.185	-6.563	-6.950
2-tailed p	0.000	0.000	0.090	0.000	0.000	0.000	0.000	0.000	0.000

Table 5.30 : **Wilcoxin Matched Pairs Test for Risk Elements (*contd*)**

	Off take risk	*Currency Risk*	*Force Majeure Risk*	*Legal Risk*	*O&M Risk*	*Regulatory Risk*	*Environmental Risk*	*Interest rate Risk*	*Refinance Risk*
Z score	-7.185	-6.628	-7.131	-7.143	-7.131	-5.143	-4.321	-6.587	-6.626
2 tailed p	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

The above results clearly show that there are statistically significant differences between attitudes of credit officers towards risk identification in different sectors. Since most of the power projects are bid on a single-point criterion of 'the lowest bid', the risk of bidding is definitely more in power than road. As power projects are bid on long-term power purchase agreements, disputes among the equity partners or one of the partners trying to sell their stake is a common risk. Financing pattern and key ratios used for appraisal are clearly different. In power sector there may be foreign equity that is brought in apart from large number of foreign lenders; hence so currency risk also exists. Construction as well as operational issues is quite different from sector to sector as already pointed out. Besides, regulatory and environment risk is also different as coal-fired thermal plants may need a flash-disposal system which may not be needed in roads. Banks do face refinance risk as asset liability mismatch is of great concern while lending to these sectors, particularly in the

light of take-out financing schemes not doing so well. However, the promoters risk is evident in both the sectors, and, the banker's attitude towards them is also not significantly different, meaning that promoter's strength is clearly important for the banker irrespective of the sector he is financing.

5.3.1. Risk Analysis and Measurement: Based on literature, risk analysis and measurement techniques survey method was adopted by the researcher to study the various risk factors that Indian banks adopt while appraising proposals for project financing. Table 5.31 gives the summary responses of the survey analysis.

Table 5.31 **: Risk Analysis and Measurement Techniques (Summary of Responses)**

Percentage of Responses within each rank (N=70)													
Stipulating Benchmarks (%)		Sensitivity Analysis (%)		Exposure Limits (%)		Maturity Profile of Loan Book (%)		Risk Scoring (%)		Periodic Review (%)		Credit Audit (%)	
Yes (Y)	No (N)	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
90	10	91.4	8.6	97.1	2.9	91.4	8.6	98.6	1.4	100		94.3	5.7

As indicated by the above table, most banks (90%) stipulate benchmarks for the elements of appraisal discussed in this chapter. These benchmarks often form the backdrop against which risk scoring, appraisal and thereafter pricing is decided. Static measures like sensitivity analysis (91.4%) are used. Based on research and prior experience, most of the banks (97.1%) set exposure limits for each sector beyond which the lending to the particular sector cannot increase. Banks face asset liability mismatch, hence, maturity profile of loan book (91.4%) is important. Almost all banks (98.6%) use credit scoring. However, most of the formats do not change from sector to sector. Periodic review is done by all banks

(100%), though credit audit is used by only 95 per cent of the banks as a monitoring tool. Banks generally give a rating to the project based on credit scores which indicate the levels of risk. Pricing is therefore decided on the rated risk factors.

Table 5.32: **Techniques for Pricing Credit Risk : Summary of Responses**

Percentage of Responses within Each Rank (N=70)											
Portfolio Quality (%)		Value of Collateral (%)		Market Rates (%)		Perceived Value (%)		Strategic Reasons (%)		Portfolio Sector Exposure (%)	
Yes (Y)	No (N)	Y	N	Y	N	Y	N	Y	N	Y	N
97.1	2.9	91.4	8.6	58.6	41.4	57.1	42.9	37.1	62.9	87.1	12.9

It is clear that for pricing 'portfolio of loans approach' is used by most of the banks depending on quality (97.1%) and sector exposure (87.1%). Value of collateral (91.4%) plays an important role in pricing and so does market rates and perceived values of assets. Banks also use standardized approach of Basel II for measuring capital requirements for credit risk in the infrastructure sector.

Table 5.33 : **Use of Credit Risk Model : Summary of Responses**

Percentage of Responses within each rank (N=70)					
Altmans Z score	Mertons Model	KMV credit monitor	Credit Metric	CRISIL RAM	Credit Portfolio, Mckenzie
34.3%	0%	10%	37.1%	100%	0%

Most of the banks use credit risk model for measuring risk out of which CRISIL RAM (100%) appears to be the most suited model. Finally, a paired sample t-test is done for all consolidated elements for both the power and road sectors. The results are summarized in Table 5.34.

Table 5.34 : **Paired Sample T-Test (Total elements)**

Variable	*N*	*Standard Deviation*	*Standard Error*			
Road	70	2.75	0.27			
Power	70	3.14	0.22			
Difference of Mean Road-power	Standard Deviation	Standard Error Mean	Correlation	T Test	Degrees of Freedom	Significance (2 Tailed) at 0.05 level
-32.58	7.62	0.91	0.479	-35.76	69	0.000

The mean difference between the attitudes towards appraisal of roads and power sectors is 32.58 with a standard deviation of 7.62 and a standard error of 0.91. This results in a t-value of 35.76 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. The difference in attitude towards elements of appraisal of road and power sectors is statistically significant. However the results of ANOVA suggest that on factors related to the promoter, particularly his track record and financial prudence and the difference in attitude are not statistically significant. Further analysis of all risk elements using the non-parametric Wilcoxin Matched Pairs Test also suggests that attitude towards promoter's risk is not significant.

Conclusion

Thus, based on the above tests,

- **the null hypothesis : "H0 = Attitude of credit officers towards relative importance of credit scoring sub-variables on the over-all credit score of each element of risk, as used in credit rating mechanism, is not different from sector to sector while appraising projects in the above chosen sectors" can be rejected.**

  and

- **the alternate hypothesis : "H1 = Attitude of credit officers towards relative importance of credit scoring variables on the over-all credit score of each element of risk, as used in credit rating mechanism depends on inherent risks unique to the sector and the status of a promoter" can be accepted.**

Section C

Structural Issues

As discussed in the literature survey, infrastructure finance in India follows Project Finance structure which is quite different from traditional Corporate Finance, which is essentially a "recourse-based" lending, that means, a bank can have recourse to the balance sheet of the promoter in times of distress. Most of the infrastructure projects use a "non-recourse" or limited- recourse structure, meaning that either there is no recourse to the balance sheet of the promoter or recourse is limited under certain conditions. This leads to a strong impact on the way projects are appraised as the banks have to create a security structure which is mostly intangible.

In this section the attitude of the appraising officers towards appreciation of these two structures is discussed.

5.4. Testing of Hypothesis Two: Structural Issues

For the structural differences between corporate and project finance, hypothesis testing is related to the differences between the mean of the two samples, that is credit officers who have appraised projects in infrastructure sector and traditional projects started by corporate sponsor.

- **HO = Banks are using 'with recourse' structure to fund infrastructure projects, which is not different from financing corporate projects.**

- **H1 = Banks are using project finance structure to fund infrastructure projects with 'no or limited recourse' which is different from financing corporate projects.**

5.4.1 Hypothesis Testing : Structural Issues:

- **Both parametric and non parametric tests are used for hypothesis testing :** Because of an apparent difficulty in the ability to obtain a clear security structure, this section looks into the resultant impact on appraisal and financing issues across corporate

and infrastructure projects. Parametric t-test is used for testing hypothesis for paired data on corporate and infrastructure projects.

5.4.1.1 *Sponsor's Track Record/ Support to Capital Cost:* Sponsor's track record and support to the project is critical, be it infrastructure or corporate project. Manager's attitude towards the appraisal for both kinds of projects is discussed below.

Table 5.35 : **Paired Sample t -Test (Sponsor's Track Record/ Support to Capital Cost)**

Variable	N	Standard Deviation	Mean
Corporate Projects	70	0.37	4.84
Infrastructure Projects	70	0.35	4.86

Difference of Mean Corporate-Infrastructure -0.02	Standard Deviation 0.50	Standard Error Mean 5.93E-02	Correlation 0.048	T Test -0.241	Degrees of Freedom 69	Significance (2-Tailed) at 0.05 level 0.810

The mean difference between the attitudes towards appraisal of sponsors in corporate and infrastructure project is 0.02 with a standard deviation of 0.50 and a standard error of 5.93E -02. This results in a t-value of 0.241 with 69 degrees of freedom and a probability of 0.810 which is greater than 0.05, which is the chosen level of significance. Therefore, bankers feel that sponsor's track record and support has a greater say in appraisal of infrastructure compared to corporate projects in general. The difference in attitude towards sponsor's track record and support for corporate and infrastructure projects is not statistically significant. That means, banker's attitude towards sponsor's appraisal does not change from corporate to infrastructure projects.

5.4.1.2 *Importance of Project Cash Flows for Repayment***:** The success of a project would depend on the cash flows generated by it. While, in corporate projects these cash flows accrue to the sponsor, in infrastructure projects, because of special purpose vehicle being created, the banker tries to capture the cash flows both for repayment and monitoring.

Table 5.36 **: Paired Sample t -Test (Dependence on Project Cash Flows for Repayment)**

Variable		*N*		*Standard Deviation*		*Mean*	
Corporate Projects		70		0.79		3.81	
Infrastructure Projects		70		0.43		4.81	

Difference of Mean Corporate - Infrastructure -1.00	Standard Deviation 0.98	Standard Error Mean 0.12	Correlation 0.234	T-Test -8.555	Degrees of Freedom 69	Significance (2-Tailed) at 0.05 level 0.000

The mean difference between the attitudes towards appraisal of cash flows in corporate and infrastructure projects is 1.00 with a standard deviation of 0.98 and a standard error of 0.12. This results in a t-value of 8.555 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers feel that the assessment of cash flows is more critical in infrastructure projects compared to corporate projects in general. The difference in attitude towards the importance of assessment of cash flows in infrastructure and corporate projects is statistically significant.

5.4.1.3 *Recourse to Balance Sheet***:** As a measure of comfort, the banker seeks recourse to the balance sheet of the sponsor.

Table 5.37 **: Paired Sample T-Test**

(Recourse to Sponsor's Balance Sheet for Collateral /Security)

Variable	N	Standard Deviation	Mean
Corporate Projects	70	0.50	4.43
Infrastructure Projects	70	0.54	2.79

Difference of Mean Corporate Infrastructure 1.64	Standard Deviation 0.72	Standard Error Mean 8.64 E-02	Correlation 0.023	T Test 19.010	Degrees of Freedom 69	Significance (2 Tailed) at 0.05 level 0.000

The mean difference between the attitudes towards establishing recourse on the sponsor's balance sheet in corporate and infrastructure projects is 1.64 with a standard deviation of 0.72 and a standard error of 8.64 E-02. This results in a t-value of 19.010 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers generally feel that establishing recourse is possible more in corporate projects compared to infrastructure projects. The difference in attitude towards establishing recourse in infrastructure and corporate projects is statistically significant.

5.4.1.4 *Legal and Structural Dependence*: The external parties involved in infrastructure projects are many compared to corporate projects. This leads to voluminous legal and documentary issues. The strength of an appraisal often lies on how well these issues are tied up.

Table 5.38 : **Paired Sample T-Test (Legal and Structural Dependence)**

Variable	*N*	*Standard Deviation*	*Mean*				
Corporate Project	70	0.58	2.74				
Infrastructure Projects	70	0.51	4.64				
Difference of Mean Corporate - Infrastructure -1.90	Standard Deviation 0.80	Standard Error Mean 9.58 E-02	Correlation 0.070	T Test -19.839	Degrees of Freedom 69	Significance (2 Tailed) at 0.05 level 0.000

The mean difference between the attitudes towards a strong legal and documentary structure in corporate and infrastructure projects is 1.90 with a standard deviation of 0.80 and a standard error of 9.58 E-02. This results in a t -value of 19.839 with 69 degrees of freedom and a probability of less than 0.05, which is the chosen level of significance. Therefore, bankers feel that legal and structural issues are more critical in infrastructure projects compared to corporate projects in general. The difference in attitude towards the importance of legal and structural issues in infrastructure and corporate projects is statistically significant.

5.4.1.5 *Acceptable Range of Ratios*: Normally each bank has an acceptable set of financial ratios to judge the viability of projects

Table 6.39: **Paired Sample T-Test**

(Ideal/Acceptable Range for Ratios like Debt Equity, DSCR)

Variable	*N*	*Standard*	*Mean*

		Deviation	
Corporate Projects	70	0.41	4.79
Infrastructure Projects	70	0.60	3.07

Difference of Mean	Standard Deviation	Standard Error Mean	Correlation	T Test	Degrees of Freedom	Significance (2 Tailed) at 0.05 level
Corporate Infrastructure 1.71	0.70	8.43 E-02	0.063	20.35	69	0.000

5.4.1.6. *Conclusion*: It is quite clear that there is a statistically significant difference between security issues and financing issues between corporate and infrastructure projects. Credit officers had significant differences in their ability to create a security structure across these projects in the corporate and infrastructure sectors. Though on factors such as identification of cash flows, recourse to balance sheet, legal and documentary issues and key ratios, credit officers showed marked differences, on sponsor's track record, the difference was not statistically significant. This means that sponsor's appraisal is critical, be it a corporate or an infrastructure project. In the light of the above analysis and results of tests, the null hypothesis :

- **"HO = Banks are using 'with recourse' structure to fund infrastructure projects which is not different from financing corporate projects", can be rejected, because the difference in the mean between two samples is statistically significant,**

while the alternate hypothesis :

- **"H1 = Banks are using project finance structure to fund infrastructure projects with 'no or limited recourse' which is different from financing corporate projects", can be accepted.**

5.5. Summary and Interpretation of Results: Project Structure

Statistics for the survey conducted on credit officers' attitude on structure of infrastructure projects to corporate projects are summarized in Table 6.40.

Table 6.40: **Summary of Statistics: Project Structure (Paired Sample t-Test)**

Serial No.	Parameter	Comparative statistics						
		Mean (Corp. Projects)	Mean (Infra Projects)	Std. Devn.	Corr.	df	Paired t-test	Sign (2 tailed) at 0.05
1.	Sponsor's track record/ financial support to project	4.84	4.86	0.50	0.048	69	-0.241	0.810
2.	Repayment dependence only on project cash flows	3.81	4.81	0.98	0.234	69	-8.555	0.000
3.	Recourse to balance sheet of sponsor	4.43	2.79	0.72	0.023	69	19.01	0.000
4.	Legal/Contractual dependence	2.74	4.64	0.80	0.070	69	-19.83	0.000
5.	Ideal/Accepta	4.79	3.07	0.70	0.06	69	20.35	0.000

				3				
ble financial ratios								

There is no statistical difference in the credit officers' view of appraising the track record and financial strength of sponsors in infrastructure or corporate project. However, the elements that differentiate corporate finance from project finance are: Recourse to balance sheet; Absolute dependence on the project cash flows rather than sponsor's cash flows; Dependence on legal and contractual structures; and the Preset range of appraising ratios that will work across the sectors. Thus, there are significant statistical differences in the attitudes of appraising officers between corporate and infrastructure projects. This is further substantiated by data which was collected on nominal scale and verified by Wilcoxin Matched Pairs Signed Ranks Test. For each element that defines the security structure, non-parametric test was used for paired data that was collected for corporate and infrastructure projects.

Table 5.41: **Wilcoxin Matched Pairs Signed Rank Test**

(Security structure of Financing Corporate Projects and Infrastructure Project)

	Fixed Assets on Balance Sheet of sponsor	*Limited to Project Fixed Assets*	*Movable Assets on Balance sheet of sponsor*	*Limited to Project Movable Assets*	*Pledging of Equity Project - Corporate*	*Escrow/ TRA Account Project- Corporate*	*Full Recourse to B/S*	*No Recourse to B/S*	*Partial Recourse to Balance Sheet*
Z score	-7.416	-7.550	-7.141	-8.246	-7.348	-7.216	-6.379	-6.172	-5.960
2-tailed p	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

The table above shows that there are statistically significant differences in the attitude of credit officers towards creating a security structure in corporate and infrastructure projects. It is quite clear that, though in corporate projects fixed assets of the sponsor can also be mortgaged as collateral security, in infrastructure projects only project assets can be mortgaged. Similarly, in corporate projects, though movable assets of corporate sponsors can be hypothecated, it is not possible in infrastructure projects. Bankers are able to get an equity pledge from sponsors in corporate projects which are quite unlikely in infrastructure projects. Escrow or TRA account is quite common to capture end-use of funds or for monitoring infrastructure projects, it is unlikely in corporate projects. Most of the infrastructure projects are financed by "non-recourse" or "limited-recourse" structure, whereas corporate projects are financed by recourse structures.

Therefore, the null hypothesis:

- **"Banks are using 'with recourse' structure to fund infrastructure projects which is not different from financing corporate projects" is rejected,**

and the alternate hypothesis **:**

- **"Banks are using Project Finance structure to fund infrastructure projects with 'no or limited recourse' which is different from financing corporate projects" is accepted.**

Infrastructure projects are executed by the sponsors forming a Special Purpose Vehicle. This is an independent company under the Companies Act, 1956. Statistically speaking, the difference in credit officers' approach towards creating security structure for infrastructure projects was significantly different from the traditional practice that has been in use for corporate project financing. It is quite clear that, though in corporate projects fixed assets of the sponsor can also be mortgaged as collateral security, in infrastructure projects only project assets can be mortgaged. Similarly, in corporate projects, though movable assets of corporate sponsors can be hypothecated, it is not possible in infrastructure projects. Bankers are able to get an equity pledge from sponsors in corporate projects which are quite unlikely in infrastructure projects. Escrow account or TRA account is quite common to capture end-use of funds or for monitoring in infrastructure projects, it is unlikely in corporate projects.

Also corporate and personal guarantees from the sponsors are difficult to obtain in the case of infrastructure projects. As the structure is essentially "no recourse or partial recourse" basis, the cash flows from the project itself become important. The success or failure of the appraisal would depend largely on whether the project itself will be able to generate sufficient cash flows to sustain itself and service the debt, as the support from sponsors is limited. Therefore, the bankers create a large structure around the special purpose vehicle of various project parties, described in the earlier chapters, bound tightly by contracts and agreements. This is done for the purpose of risk sharing and also for risk mitigation in the light of security structure which is essentially intangible. Though the credit officers follow a certain range of financial ratios that are acceptable, in the case of

infrastructure projects, this seems unlikely. This difference in structure in corporate and infrastructure projects also necessitates that the bankers differ in their approach while appraising these projects. Appraisal of infrastructure projects is generally more detailed and exhaustive than corporate projects particularly in the light of intangible security structure and involvement of various parties and contracts.

5.6. Summary and Interpretation of Results: Project Appraisal and Risk Identification

Project appraisal involves risk identification, mitigation and measurement which are done simultaneously with the appraisal process. Project appraisal generally involves economic and industry analysis before coming down to the specific company concerned. These economic and industry drivers are generally used for financial projections by the borrower. In the descriptive research described and case studies, a clear process is defined for infrastructure sector in general and road and power sectors in particular. The credit officer then further appraises a particular project based on factors intrinsic to the project as well as external factors. The credit officer uses a credit-rating mechanism for measuring risk and as a pointer towards probability of default. The credit rating mechanism has both qualitative as well as quantitative factors. Scores are assigned to each of the sub-variables under each factor which are then added up to obtain the consolidated score of the factors and then the project as a whole. This score corresponds to a particular rating class which is pre-decided, based on its predictive power of probability of default, as explained in the literature survey, and, based on the rating that the project gets, the pricing is decided. This research has focused on the credit-rating mechanism. A summary of results of the survey conducted on rating parameters for road and power sectors is shown below:

Table 5.42 : Summary of Statistics :

Project Appraisal and Risk Measurement (Paired Sample t-test)

Serial No.	Parameter	Comparative statistics					
		Difference of mean Road – Power	Std. Devn.	Corr.	df	Paired - test	Sign. (2 tailed) at 0.05
1.	Management Quality	- 1.77	2.04	0.220	69	-7.275	0.000
2.	Market Potential - Demand Issues	- 2.84	2.3445	0.113	69	-10.145	0.000
3.	Market Potential - Price Issues	-5.64	2.7454	-0.01	69	-17.19	0.000
4.	Technological Issues	- 5.51	2.43	0.161	69	-18.985	0.000
5.	Construction Issues	- 3.86	2.41	0.138	69	-13.39	0.000
6.	Operational Issues	- 2.62	2.03	0.055	69	-10.79	0.000
7.	Legal Issues	-3.10	2.23	0.270	69	-11.64	0.000
8.	*Force Majeure* Issues	-4.70	2.10	0.319	69	-18.71	0.000
9.	Funding Issues	-2.50	2.19	0.162	69	-9.543	0.000

Analysis of variance was conducted for each of the sub-variables under the above parameters. The results are summarized in Table 5.43.

Table 5.43 : Summary of Statistics : Project Appraisal & Risk Measurement (ANOVA: Single Factor)

	Mean Road (N=70) df=69	Mean Power (N=70) df=69	Anova Statistics	F value	F critical	P value at 0.05 significance level
Management Quality						
1. Transparent Shareholders Agreement	4.21	4.64	DF=1 MS=6.42	10.83	3.909	0.001
2. Sponsors Track Record	4.27	4.28	DF=1 MS=0.007	0.010	3.909	0.918
3. Sponsors Financial Prudence	4.63	4.65	DF=1 MS=0.028	0.070	3.909	0.791
4. Infusion of Capital	2.81	3.76	DF=1 MS=31.11	31.23	3.909	0.000
5. Government Grant / Viability Gap Funding	2.71	3.11	DF=1 MS=5.6	9.05	3.909	0.003
Market Potential - Demand Issues						
1. Single or Multiple Buyer	3.41	3.67	DF=1 MS=2.314	6.59	3.909	0.011
2. Contractual Agreement with the Buyer	2.80	4.21	DF=1 MS=70.00	175.66	3.909	0.000
3. Long term Demand Supply Gap	3.11	3.63	DF=1	36.05	3.909	0.000

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			MS=9.25			
4. Competition from New Entrants/ Alternate Facilities	3.19	3.10	DF=1 MS=0.25	0.58	3.909	0.446
5. Cyclicality/ Recession in General Economy	2.93	3.66	DF=1 MS=18.57	74.49	3.909	0.000
Market Potential - Price Issues						
1. Charges Predefined by Government/ Bidder	2.77	4.53	DF=1 MS=108.06	196.77	3.909	0.000
2. Bids Servicing Costs	2.83	4.71	DF=1 MS=124.45	356.11	3.909	0.000
3. Off-take, Demand Driven, Take or Pay	3.03	4.63	DF=1 MS=89.60	166.44	3.909	0.000
4. Charges Economical for the Off-taker	3.06	4.57	DF=1 MS=80.25	151.89	3.909	0.000
5. Level of Competition	*3.89*	*2.77*	*DF=1 MS=43.45*	*50.21*	*3.909*	*0.000*

Table 5.43 (continued*)*

Technical Issues						
1. Land Acquisition /R & R	2.41	3.66	DF=1 MS=54.06	74.04	3.909	0.000
2. Clearance from MoEF/PCB/ Others	3.29	4.59	DF=1 MS=59.15	121.33	3.909	0.000
3. LIE Opinion on Aggressiveness	3.66	3.83	DF=1 MS=1.02	1.82	3.909	0.178
4. Technology and Operational Risk Issues	3.61	4.53	DF=1 MS=29.25	48.04	3.909	0.000
5. Testing and Commissioning Risks	2.51	4.40	DF=1 MS=124.45	122.42	3.909	0.000
Construction Issues						
1. Fixed Time Fixed Price All Inclusive EPC Contract	3.60	4.24	DF=1 MS=14.46	22.25	3.909	0.000
2. Liquidated Damages/ Defects Liability	3.86	3.81	DF=1 MS=0.064	0.11	3.909	0.735
3. Parent Company Guarantees	2.36	4.09	DF=1 MS=104.57	111.39	3.909	0.000
4. Reasonability of EPC Contract Price	3.71	4.59	DF=1 MS=26.57	59.86	3.909	0.000

5. Benchmarking under Similar Contracts	*3.73*	*4.39*	*DF=1 MS=15.11*	23.58	3.909	0.000
Operational Issues						
1. Pricing of Operations and Management Contract	3.99	4.34	DF=1 MS=4.46	7.62	3.909	0.006
2. Track Record of O & M Contractor	3.77	3.87	DF=1 MS=0.35	0.96	3.909	0.328
3. Defining events of default	4.59	4.46	DF=1 MS=0.573	0.903	3.909	0.343
4. Input Linkages	2.94	4.77	DF=1 MS=117.02	502.88	3.909	0.000
5. Termination/Quick Replacement in Case of Suboptimal Performance	*3.14*	*3.61*	*DF=1 MS=7.77*	*17.55*	*3.909*	0.000

	Mean Road (N=70) df=69	Mean Power (N=70) df=69	Anova Statistics	F value	F critical	P value at 0.05 significance level
Legal Issues						
1. Charter of SPE	3.16	3.74	DF=1 MS=12.00	40.7	3.909	0.000
2. Trustee and Intercreditor Arrangements	2.99	4.06	DF=1 MS=40.17	63.90	3.909	0.000
3. Enforceability of Rights and Remedies	4.53	4.59	DF=1 MS=0.114	0.230	3.909	0.631
4. Legal opinion of Documentation and Taxation	3.23	3.87	DF=1 MS=14.46	25.52	3.909	0.000
5. Dispute Redressal	3.09	3.83	DF=1 MS=19.31	51.82	3.909	0.000
Force Majeure Issues						
1. Identification of Force *Majeure Issues*	4.49	3.79	DF=1 MS=17.15	29.12	3.909	0.000
2. Sufficient Insurance Coverage to prevent default	2.77	4.59	DF=1 MS=115.20	267.97	3.909	0.000
3. Enforceability of contract Termination	2.34	2.86	DF=1 MS=9.25	21.17	3.909	0.000
4. Coverage of Supply	3.21	4.47	DF=1	80.15	3.909	0.000

Default			MS=55.31			
5. Termination Benefits	2.56	4.37	DF=1 MS=115.20	156.46	3.909	0.000
Funding Issues						
1. Equity Commitment and Strength of Sponsors	3.63	4.39	DF=1 MS=20.06	35.08	3.909	0.000
2. Stability of Cash Flows	4.63	4.50	DF=1 MS=0.57	2.00	3.909	0.159
3. Tenor of Loans	2.83	4.43	DF=1 MS=89.6	196	3.909	0.000
4. Reasonableness of Capital costs	3.80	4.39	DF=1 MS=0.114	0.230	3.909	0.631
5. Viability and Bankability of Projects	4.24	3.93	DF=1 MS=3.45	6.86	3.909	0.090

Key results in the appraisal of projects, particularly in Road and Power sector are as under:

Management Quality/Risk: Much importance is given to the transparent shareholders' agreement, sponsor's track record and **project team** and financial prudence by the appraising officers. Though the t-test (p value = 0.000 at 0.05 significance) shows that there is significant difference in attitude of credit officers on relative importance of all factors contributing to management appraisal in road and power sectors, the analysis of variance result shows that the difference is not significant in factors like sponsor's track record (p value =0.918 at significance level of 0.05) and financial prudence (p value of 0.791 at significance level of 0.05). Further, Wilcoxin matched pairs test (p value =0.090 at a significance level of 0.05) also shows that the difference is not significant in how the credit

officers view promoter's risk across sectors. This clearly shows that bankers appraise promoters on similar parameters and across sectors. In the case of infrastructure sector, the project team that the promoter assembles is of critical importance as its members are the ones who will have to take the project forward, ensure its speedy execution and happy conclusion. **The issue of equity infusion and that too timely is critical for the bankers**. Bankers expressed reservations about the fact that many a times promoters award key contracts like EPC, O & M etc to themselves from the SPV leading to issues of **padding up in the cost of project. (Role of Independent Engineer in vetting the cost and monitoring is critical)**

Market Potential/Risk: Demand and Price Risk: In demand issues high importance is given by appraising officers to the long-term demand gap (often indicated by the 'willingness to pay survey', origin-destination surveys conducted by Traffic Consultants) and the alternate routes in the road sector. "No alternative route clause" at least for some years is often sought by appraising officers in road projects. In pricing issues regarding road-toll rates and escalation clauses with reference to toll rates, appraising officers give high importance. **Also bankers expressed some reservation on the quality of traffic forecasts submitted by traffic engineers. There are serious flaws in the sample sizes of different class of vehicles and the methodology of traffic projections. They also expressed that sometimes different sample sizes and different formulaes are used to project traffic and therefore the financial appraisal itself starts off with a wrong number.**

In power sector, contractual agreement with the buyer (**power purchase agreement and its terms and conditions**) is given the highest importance by appraising officers. High importance is also given to factors like long-term demand-supply gap or presence of **contingent buyer**. In pricing issues a very high importance is given by appraising officers on the **bid amount** given by the borrower in order to ensure that the same will be able to **service the costs**. Also the highest importance is given to factors like off-taker's (State Electricity Board's) ability to service payments,(**Escrowability**) contractual agreements like "Take or Pay" to make sure that they are signed. However, the t-test results show (p value =0.000 at a significance level of 0.05) that there is a significant difference in attitude towards both demand and pricing issues across sectors. The analysis of variance results also show a

significant difference across all factors in demand and pricing issues except for competition from new entrants (p value 0.446 at significance level of 0.05) in case of demand issues. And Wilcoxin matched pairs test shows that the difference is significant in the case of price risk, bid risk, off-take risk, interest rate risk and currency risk across sectors. This is on account of the different terms of the loan and also the fact that mostly only power sector projects attract foreign investors and loans.

Technological Issues/Risks: In technological issues, high importance is given by the lenders to the report submitted by their engineers on the road sector, as also the design and land acquisition issues (**right of way**). In power sector, the highest importance is given to technological and operational risks involved as **plant-load factors depend on technologies (critical/super critical)** and many a time bids are dependant on efficiencies of super-critical technologies. Also testing and commissioning is given very high importance in power since power purchase agreement is often linked to it. **Clearances** from the government agencies like Pollution Control Board and Ministry of Environment and Finance is also given high importance as many power projects depend on satisfactory resolution of these issues. However, the t-test results (p value = 0.000 at a significance level of 0.05) show that there is a significant difference in attitude towards technological issues across sectors. The analysis of variance results also show a significant difference across all factors in technological issues except lenders' independent engineer's report (p value 0.178 at significance level of 0.05). Also Wilcoxin matched pairs test shows that the difference is significant in case of technology and environmental risk across sectors.

Construction Issues / Risk: In the road sector, high importance is given to the **Fixed-time Fixed-price EPC contract** and whether it is benchmarked against similar contracts with adequate **liquidated damages**. Appraising officers need to be careful of the risk of over padding, if it is sub-contracted by the SPV handling the project to one of the sponsors itself, as it leads to corporate governance issues.

In the case of power sector, the highest importance is given to all the issues discussed so far and also to the comments of the engineers of the lender once the **aggressiveness of EPC contract is taken note of. Also the costing of Boiler Turbine Generator (BTG) and Balance of Plant (BOP) is critical. Availability of Equipment is critical in the power sector**.

Indigenous equipments providers are few like BHEL, JSW, Thermax etc and Chinese equipments have some quality issues. Many projects get delayed as right kind of equipments that will not underperform on domestic coal/imported coal/blended don't come on time. The parent company guarantees are also sought particularly against cost overrun. Regarding time overruns, it is often sought to be protected by liquidated damages, though it is capped at 20 per cent. However, the t-test results (p value = 0.000 at a significance level of 0.05) show that there is a significant difference in the attitude towards both construction issues across sectors. The analysis of variance results also shows a significant difference across all factors in construction issues except for liquidated damages (p value 0.735 at significance level of 0.05), which is a part of all EPC contracts and independent of sectors. Also Wilcoxin matched pairs test shows that the difference is significant in case of time and cost overrun risks across sectors. This is on account of the different tenure of projects and technological sophistication of EPC contractors.

Operational Issues/Risk: In the road construction, the track record and pricing of O&M contract is given the maximum importance. If the O&M contractor is good, the banker is assured of adequate flow into the TRA account; surveillance and monitoring also become easier. Bonus and penalties also need to be adequately defined. Now a days in the road sector **technology that the Operator brings in order to monitor traffic** and curb pilferages and breach of toll roads is also critical.

As far as power sector is concerned, the highest importance is given to supply/input linkages since many a power projects fail if these are not lined up systematically**. Issues about Fuel Linkages, a long tenured Fuel Supply Agreement, Volatility in the Price of Imported coal and transport agreements are very important. In the present day world coal linkages, both domestic and imported, sovereign issues in import of coal, huge fluctuation in imported coal pricing, inability of coal supplier to get into long term fuel supply contracts are major concerns.** In the case of road, the rest of the factors described above are also given adequate importance. If sub-optimal performance is observed in the case of power, quick replacement clause is included. However, the t-test results (p value =0.000 at a significance level of 0.05) show that there is a significant difference in attitude towards operational issues across sectors. The analysis of variance results also shows a significant difference

across all factors in operational issues except for track record of O&M contractor (p value 0.328 at significance level of 0.05) and defining events of default and bonuses (p value 0.343 at a significance level of 0.05), which are independent of the sector and part of normal due diligence. Also Wilcoxin matched pairs test shows that the difference is significant in the case of O&M risk across sectors.

Legal Issues: In the case of roads, the appraising officers give the highest importance to **enforceability of rights and remedies** as well as legal opinion on documentation and dispute redressal mechanism. Issues like **Termination Benefits not available on concessionaire's default in the construction period** still bother the bankers. Also many a times the benefits as well as Viability Gap Funding is released **on Originally estimated cost of project whereas due to execution delays the actual cost and therefore funding may be higher**. In the case of power, apart from these factors, trustee and inter-creditor issues are also given sufficiently high importance. Many a time, because of complex legal and documentary issues, projects take a lot of time to achieve the financial closure. The tighter the contracts are bound the better the appraisal is because tangible security is really notional, and, intangible security is often already assigned to various projects, contracts and agreements on hand. So, the legal appraisal becomes extremely important for all sectors especially power as the off-taker (SEB) is also often tied with a legal agreement (PPA). However, the t-test results (p value =0.000 at a significance level of 0.05) show that there is a significant difference in attitude towards legal issues across sectors. The analysis of variance results also show a significant difference across all factors in legal issues except for enforceability of contracts (p value 0.631 at significance level of 0.05). This is obvious as enforceability of contracts provides protection to lenders across sectors. Also Wilcoxin matched pairs test shows that the difference is significant in the case of legal risk across sectors. This is on account of the different types of regulations and the nature of agreements signed which differ from sector to sector.

Force Majeure **Issues:** *Force majeure* issues are of two kinds, political and non-political. In both the sectors high priority is given to identification of issues and termination benefits which may protect the banker in times of crisis. Insurance and coverage of supply default is given high importance in the case of power sector. However, the t-test results (p value

=0.000 at a significance level of 0.05) show that there is a significant difference in attitude towards *force majeure* issues across sectors. The analysis of variance results also show a significant difference across all factors in *force majeure* issues. Also, Wilcoxin matched pairs test shows that the difference is significant in the case of *force majeure* and regulatory risk. This is on account of the different regulations that govern both the sectors.

Funding Issues: Stability of cash flows and viability and bankability of projects have been considered as the most important factors by bankers for the road sector, whereas for power, in addition to these factors, equity commitment from sponsors and reasonableness of capital costs are also given the maximum priority. As the projects are financed on non-recourse basis, stability of cash flows is important for both the sectors. Bankers generally give due diligence to project costs, means of finance, and, projected cash flows given by the borrower since they are applicable to both the sectors. **Building a reasonable cushion between the tenor of loans and tenor of concession agreement is also crucial.** However, some critical ratios, which are part of the appraisal, also differ from sector to sector. However the t-test results (p value = 0.000 at a significance level of 0.05) show that there is a significant difference in attitude towards funding issues across sectors. The analysis of variance results show that there is no significant difference in the stability of cash flows (p value = 0.159 at a significance level of 0.05), estimating reasonableness of capital costs (p value = 0.631 at a significance level of 0.05) and viability and bankability of projects (p value = 0.090 at a significance level of 0.05) across all factors in funding issues. This also shows that financial appraisal more or less does not change from sector to sector. Also Wilcoxin matched pairs test shows that the difference is significant in the case of funding and refinance risks. This is on account of the problem of asset liability mismatch and lack of adequate take-out facilities for refinancing.

The lenders use Trust and Retention account with a waterfall mechanism to capture and control cash flows. In case of power projects, escrow charge is often created on the offtakers. For this the role of facility agent becomes critical. Often cash sweeps and cash traps are used in case where there is a shortfall in DSCR or a slow buildup of cash in the TRA account.

Project Structure: The research found out that there is no statistical difference in the credit officers' view of appraising the track record and financial strength of sponsors in infrastructure or corporate project. However, there is a statistical difference in the elements that differentiate corporate finance from project finance are: Recourse to balance sheet; Absolute dependence on the project cash flows rather than sponsor's cash flows; Dependence on legal and contractual structures; and the Preset range of appraising ratios that will work across the sectors. Thus, there are significant statistical differences in the attitudes of appraising officers between corporate and infrastructure projects. This is further substantiated by data which was collected on nominal scale and verified by Wilcoxin Matched Pairs Signed Ranks Test.

Identification of Risks: The risks, which can have an impact on the credit quality of the project, are termed as "risk drivers". Through descriptive research and survey method, risks are identified. It can be said that the 'Sources of Risk' give birth to the `Risk Drivers' which disrupt the cash flow of the project. Risk drivers can lead to default which can be classified into four distinct areas as follows:

Table 5.44: Levels of Risk Drivers

Sr.No.	Risk Driver	Description
1	**Project Level Risks** (*a*) Contractual and Management Foundation (*b*) Technology, Construction and Operations (*c*) Competitive Market Exposure (*d*) Legal Structure (*e*) Financial Strength	Project level risks are the risks intrinsic to the project's business and the industry in which it operates
2	**Force Majeure** - **Political risk**	Political risk arises out of government's intervention in the project operations like

		expropriation, regulatory controls, etc.
3	*Force Majeure – Non-Political Risk*	Floods and earthquakes, civil disturbances, strikes, catastrophic mechanical failures etc. which can disrupt a project's cash flow
4	*Regulatory Risk*	Regulatory risk arises due to legal systems, lack of corporate governance, etc.

Risk Mitigation: After the identification of the risks, default risk has to be reduced by credit enhancements like guarantees, insurance, etc., so that the project's credit risk gets reduced. **Risk is allocated to the parties best placed to mitigate them through contracts and agreements.** But then this allocation is a process of heavy negotiation. Negotiation is in such a way that risk is completely allocated to the party and it doesn't spring up. Various agreements like those of financing, construction, sales or off-take, suppliers and insurance are done. Most of the agreements follow the principle that risk is allocated to the party best placed to mitigate or absorb that risk.

 Survey of Risk management Practices:

It is quite clear from the above discussions that projects in infrastructure sector are different in structure from corporate projects, and, therefore, the risks are also unique from sector to sector. Apart from stand-alone practices of measuring project risks like sensitivity and scenario analysis, bankers use a credit rating mechanism based on credit scoring to assess project risk. The outcome of credit rating indicates the degree of reliability and risk. Basel II has defined credit rating as a summary indicator of the risk inherent in individual credit, embodying an assessment of the risk of loss due to the default of the counter party by considering quantitative and qualitative factors. Thus, credit rating is a tool for the measurement or quantification of credit risk.

    The survey results show that most banks stipulate benchmarks for the elements of appraisal. These benchmarks often form the backdrop against which risk scoring, appraisal and thereafter pricing is done. Static measures like sensitivity analysis are used. Based on research and prior experience, most of the banks set exposure limits for each sector beyond which the lending to the particular sector cannot increase. Banks face an asset liability

mismatch so maturity profile of loan book is important. Almost all banks use credit scoring. However, the rating models are not often sector specific. Periodic review is done by all banks.

5.7 Analysis of Rating Data and Transition Matrix

As, on account of limited data, it was difficult to create a transition matrix for projects rated by banks, as a proxy, the researcher collected the project rating done by CRISIL for a period of five years. These borrower ratings correspond to a given level of probability of default. The borrowers were typically special purpose vehicles formed by sponsors and were rated. Finding quantitative methods for estimating probability of default is a first step towards Basel II compliance. The calculation of credit risk of a counter party according to Basel II capital accord involves estimation of probability of default that could be derived from corresponding transition matrix.

248 projects of the companies were identified as sample. The projects were chosen since they had reached the financial closure and rating data for all 5 years were available

The result of the mean transition matrix is as given in Table 5.45.

Table 5.45: Transition Matrix (N=248) : 2004 – 2008 (*figures in percentage*)								
Year 1	**AAA**	**AA**	**A**	**BBB**	**BB**	**B**	**C**	**D**
AAA	97.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00
AA	8.00	92.00	0.00	0.00	0.00	0.00	0.00	0.00
A	0.00	4.50	90.00	5.50	0.00	0.00	0.00	0.00
BBB	0.00	0.00	8.00	89.00	3.00	0.00	0.00	0.00
BB	0.00	0.00	0.00	3.00	88.00	6.00	0.00	3.00
B	0.00	0.00	0.00	3.00	8.00	83.00	3.00	3.00
C	0.00	0.00	0.00	0.00	10.00	0.00	50.00	40.00

| D | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 100 |

It is evident that the rating is quite stable in grades, which may be termed as investment grade – AAA (97.00) (showing that 97.00 per cent of the rated projects continued with the same rating year to year, on a one-year horizon, during the five-year period), AA (92.00%), A(90.00%) and   BBB (89.00%) . Thereafter for speculative rating like BB, B and C, the stability declines from 88 to 50 per cent which means migration across each rating grade has increased. The migration to default grade is 3 per cent in BB, 3.00 per cent in B, and 40 per cent in C grades. Hence, the lower rating is able to capture defaults quite well. This is remarkably true for C grade though the rating grade looks quite unstable. As shown by the data in Table 6.46, the percentage of loans being rated BBB is quite high. However, it becomes clear that BBB grade loans show a zero probability of default and have a remarkable upward migration, which may be due to projects reaching commencement of operation date in between the observation period. Reaching commencement of operations drastically reduces project risks. Obviously, the biggest risks that projects in India face are implementation risks as many projects do not commence on scheduled operation date. This shows that both A and BBB grades which attract higher pricing that may be reviewed along with the risk mitigants because a very significant percentage of projects show an upward migration trend.

The high percentage of upward migration in BBB rating grade suggests that banks are conservative in rating infrastructure loans till the time the project starts earning revenues. **However, if sector-specific rating mechanism along with the effect of risk mitigants is used, it will have an effect on rating of loans and subsequent pricing.**

Overall Conclusion

Both the null hypothesis being rejected, it can be inferred that infrastructure financing in India follows project finance technique which is based on "no recourse or partial recourse" method, whereby the security structure involves a large number of contracts and agreements rather than tangible collaterals. Also for appraisal, the issues involved in each sector are significantly different from sector to sector, except for promoter evaluation, so each project and sector is unique. Each sub-sector of the infrastructure is inherently unique

in terms of its administrative and organizational structure, the regulatory framework governing its operations, the level of technology, and the degree of commercialization.

The survey results show during the process of appraisal, bankers are well aware of the Project Structure as well as the sectoral challenges facing them.

What is emerging out of the survey is that though the banks are quite aware of the issues but then a very few banks have the expertise and skill sets required to identify risks sectorally, create the right kind of contracts and documents to allocate and share risks and then mitigate it. Also in terms of classification, there is a confusion regarding Project Finance and Corporate Finance. If loans which are off balance sheet (sponsor) and are to be repaid solely out of project cash flows with contracts working as second line of defence are not classified as Project Finance, then in times to come , the banking system may not have the data base to measure Probability of Default (PD) and Loss Given Default (LGD) and therefore move to Advanced IRB approaches in Project Finance (Herein, it is important to remember that Project Finance is preferred for building Infrastructure Assets)

Why it is critical in Project Finance Industry is explained in the next section.

5.8. Research Question Two

As Project Finance is included in the definition of Specialised Lending by RBI and Basel II with specific risk weightages, does fall in asset quality brings risk to the bank capital and in what manner?

The Basel committee recognizes project finance as specialized lending, a separate sub-category of Corporate asset class. The primary source of repayment of the loan is income generated by the asset being financed rather than independent capacity of a commercial enterprise. Both probability of default (PD) and Loss Given Default (LGD) depend on income from the asset, so they are related. In October 2001, the Bank for International Settlements published a working paper for specialized lending. The category is more precisely defined by its economic characteristics:

- The economic purpose of the loan is to acquire or finance an asset.

- Cash flow generated by the asset is the main source of repayment

- There is no backing by a broader commercial enterprise

- The loan is significant liability in the borrowers capital

The internal rating approach for specialized lending has four levels:

1. **Standardised Approach**: The standardized approach states that, if the project finance loans were unrated, banks would have to use 100% risk weight. If the Project Finance loan is rated, banks would use risk weights set by Basel. (75% - 350%)

2. **Basic Approach**: Regulators set PD, LGD, EAD (Exposure at Default) based on the internal rating

3. **Internal Ratings Based Approach**: Only banks that have good historical data can use this approach

   a) IRB foundation approach: Regulators set LGD/EAD or PD. Institutions estimate other parameters.

   b) IRB advanced approach: Institutions estimate PD, LGD and EAD.

The Basel paper also introduces the concept of a conditional LGD which means that LGD estimates should focus on period of downturns. The Basel Committee assumed that project finance is riskier than corporate loans. Hence, this would require higher capital requirements on project loans. There is lack of historical data and no common ground for empirical risk sensitive approach.

RBI Guidelines for Specialised Lending

Recently, the RBI issued guidelines on Implementation of the Internal Rating Based (IRB) Approaches for Calculation of Capital Charge for Credit Risk on December 22, 2011. The IRB Approach allows banks, subject to the approval of RBI, to use their own internal estimates for some or all of the credit risk components [Probability of Default (PD), Loss Given Default (LGD), Exposure at Default (EAD) and Effective Maturity (M)] in determining the capital requirement for a given credit exposure. IRB approach to capital calculation for credit risk is based upon measures of unexpected losses (UL) and expected losses (EL).

In terms of the circular, the corporate asset class includes, but is not limited to, four separate subclasses of specialised lending as mentioned above. Looking at the guidelines it

becomes apparent that, under the IRB approach, Project Finance exposure can be handled in two ways:

- According to the PD/LGD method
- According to the Supervisory Slotting Criteria approach or simplified rating method

Banks that meet the requirements for the estimation of PD will be able to use the general foundation approach for the corporate asset class to derive risk weights for Specialised Lending (SL) sub-classes subject to RBI approval. Banks that meet the requirements for the estimation of PD and LGD and/or EAD will also be able to use the general advanced approach for the corporate asset class to derive risk weights for SL sub-classes also subject to RBI approval.

Banks that do not meet the requirements for the estimation of PD under the IRB approach for SL exposures under corporate, will be required to follow the supervisory slotting criteria approach i.e. they will be required to map their internal grades to five supervisory categories (including default category), each of which is associated with a specific risk weight. This is termed as Supervisory Slotting Criteria (SSC) approach.

Supervisory Slotting Criteria

Supervisory rating grades for project finance exposures are Strong, Good, Satisfactory and Weak. RBI prescribes supervisory rating grades for all the sub classes of specialized lending separately viz., Project Finance, Income Producing Real Estate, Object Finance and Commodities Finance. The parameters of project finance include **Financial Strength** (Market conditions, Financial Ratios, Stress Analysis, Enforceability of contract, Collateral and security); **Transaction characteristics** (Design and Technology Risk, Construction Risks, Completion Guarantees, Track record and financial strength of contractor and supply risk); **Strength of Sponsor** (Track Record and support) and **Security Package** (Assignment of contracts and pledge of assets).

Based on this, supervisory categories and UL risk weights for SL exposures are given in Table below:

Table 5.46 : UL Risk Weights (Specialised Lending)

Supervisory categories	Strong	Good	Satisfactory	Weak	Default
UL Risk Weights	70%	90%	115%	250%	0%
External Rating Equivalent	BBB-or better	BB+ or BB	BB- or B+	B to C-	Not Applicable

RBI may allow banks, on a case to case basis, to assign preferential risk weights of 50% to "strong" exposures, and 70% to "good" exposures, provided they have a remaining effective maturity of less than 2.5 years or the RBI may determine that banks' underwriting and other risk characteristics are substantially stronger than specified in the slotting criteria for the relevant supervisory risk category.

For SL exposures subject to the supervisory slotting criteria, the EL amount is 9% of the risk-weighted assets produced from the appropriate risk weights, as specified below in Table Four, multiplied by EAD.

Table 5.47: EL Risk Weights (Specialised lending)

Supervisory category	Strong	Good	Satisfactory	Weak	Default
SL Risk Weights	5%	10%	35%	100%	625%

Where, RBI allows banks to assign preferential risk weights to other SL exposures falling into the "strong" and "good" supervisory categories as outlined above, the corresponding EL risk weight is 0% for "strong" exposures, and 5% for "good" exposures.

So now combining Tables, we can calculate risk weight and capital charge according to rating grade in Table 5:

Table 5.48 : Capital charge

Supervisory category	Preferred	Strong	Good	Satisfactory	Weak	Default
Risk Weight	50%	75%	100%	150%	350%	625%
Capital Charge	4.5%	6.75%	9%	13.5%	31.50%	56.25%

5.8.1 Conclusion and Recommendations

What is apparent from Tables is that the new guidelines are actually incentivizing banks to finance Strong and high rated projects (essentially means BBB- or better), thus reducing the capital charges (from the 100% risk weight) and thereby resulting in interest cost savings which depending on individual bank may be passed on to customers, who in this segment are anyways price sensitive. However on the flip side, there is heavy disincentivisation if the project slips to satisfactory or below categories. So what it may mean to banks is that they will do well only to finance well structured strong projects, otherwise the capital charges are prohibitive.

In case of defaults and repeated restructuring, the capital charges may be prohibitive for some banks. What may result from this guideline is that, if we keep the spreads constant a higher capital charge may result in negative returns for some banks.

However, banks that meet the requirements for the estimation of PD will be able to use the general Foundation approach for the corporate asset class to derive risk weights for SL sub-classes subject to RBI approval. Furthermore, banks that meet the requirements for the estimation of PD and LGD and/or EAD will also be able to use the general Advanced approach for the corporate asset class to derive risk weights for SL sub-classes also subject to RBI approval. This means, lower capital charges as the bank moves from Slotting approach to Advanced approach.

Alternatively, more sophisticated banks using Advanced IRB approaches might be able to underprice other banks using the Foundation approach which are subject to lower risk weight.

In the light of above discussion, the research indicates that that project finance business of banks which do not have data points to establish PD/LGD/EAD may be affected on account of higher capital charges. It is also suggested that it is time now perhaps for the sophisticated banks in this segment to pool their project finance data (similar to the four bank study). And, in case the banks migrating to Advanced IRB approach may , to the extent they have insufficient internally generated data to be statistically significant, use external data from an 'industry database,' provided the external data represent the project finance segment broadly over a period of 10 years and has been verified by an independent external institution/regulator. The external data may be adjusted if the bank using the data determines that the performance of its own portfolio is significantly different from the external data.

5.9. Final Conclusion and Recommendation for Banks: Challenges of Restructuring

1. **The survey results show during the process of appraisal, bankers are well aware of the Project Structure as well as the sectoral challenges/risks facing them. What is emerging out of the survey is that though the banks are quite aware of the issues but then a very few banks have the expertise and skill sets required to identify risks sectorally, create the right kind of contracts and documents to allocate and share risks and then mitigate it. (That is why a few banks are in the Asia League Tables).**

2. **Also in terms of classification, there is a confusion regarding Project Finance and Corporate Finance. Project finance consists of Government, Corporations and PPP financing investments solely through the revenue stream/cash flows of the infrastructure projects without taking recourse to government guarantees or parent company's/Sponsors balance sheet or collaterals. 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.

    a. If Projects funded by banks are not classified as Project Finance, then in times to come , the banking system may not have the data base to measure Probability of Default (PD) and Loss Given Default (LGD) using a Bank specific Project Finance Rating Model as required to move to Advanced IRB approaches for Project Finance loans.(Herein, it is important to remember that Project Finance is preferred for building Infrastructure Assets).

3. In the light of capital charges for Specialised Lending (Project Finance) as per Advanced IRB approach, more sophisticated banks using Advanced IRB approaches might be able to underprice other banks using the Foundation approach which are subject to lower risk weight. In case of defaults and repeated restructuring, the capital charges may be prohibitive for some banks. What may result from this guideline is that, if we keep the spreads constant a higher capital charge may result in negative returns for some banks.

4. Banks Capital need to be further strengthened to avoid concentration risk. But till the time Government is willing to relax its majority holding in Public Sector Banks, Tier I capital has to be strengthened largely by Budgetary allocations. Therefore Banks with smaller balance sheet size need to have a relook into their Infrastructure Finance Portfolios.

5. Syndication of loans is essentially done to share and distribute risks and also revalidate the appraisal, structure and documentation of the project . It needs strengthening of appraisal capacity in banks. There are instances when a major contributing factor of the decision to participate in syndication is the reputation of the lead syndicator/banker.

6. What needs to be done is creation of specialised cadre of credit officers in banks especially Public Sector Banks with sector wise specialisation who understand the

core rationale of using non/limited recourse debt driven Project Finance to fund capital intensive projects and look at Contracts and Documents as a means to achieve risk sharing and mitigation.

7. This sector wise specialisation in credit officers will bring in an understanding that repayment schedules need to be sculpted around the nature of sector wise cash flows. This would bring in more accuracy to cash flow projections and sector specific credit officers can then question the assumptions that have gone into creating a cash flow model.

8. Financing of infrastructure by banks and financial institutions 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 risk. Floating rate loans with appropriately priced hedges are often a solution.

9. Swap market development particularly Interest Rate swaps needs to be done for term transformation and hedging. Currently the swap markets are not entirely performing the role of term transformation and hedging.

10. Securitisation of loan portfolios may be looked in as an alternative to spread risks more widely and free capital. Needless to say proper regulation and supervision needs to be in place to prevent perverse incentives to kick in.

11. Needless to say that along with bank finance in this sector, there is a need for Infrastructure Development Funds (already launched), Take out Financing and credit enhancement products. These debt funds can attract participation from other institutions who have long term funds like Insurance and Pension Funds.

12. In this regard, Infrastructure Focussed NBFCs can play a bigger role in loan origination and onward lending.

13. But for all of this a low cost wholesale debt market segment needs to be active. In this regard an active bond market is required. In India, the bond market is privately placed bond market rather than a public bond market and there is an overcrowding effect of Government Treasury Bills. Patil Committee Recommendations may be looked into.

14. However, it is critical to understand, that there are two kind of borrowers from the debt market. One, Companies with a large operating asset base in Infrastructure space, which includes large Public and Private sector companies in energy and oil. For them, it is easier to raise money through the bond markets, including international markets, where tenure may be 30 years plus and at good price levels. However even if the issues regarding withholding taxes are addressed, they may find it difficult to raise money. The other kind of borrower are newly created SPV's with hardly any networth. For them to raise money from the bond markets, even if it is well developed would be tough as they will not get Investment grade ratings to start off with. In this manner credit enhancements by agencies like IIFCL may work, but what is critical here is that bank finance may remain as a source of initial risk capital.

15. Therefore what is more important is to address the issues in takeout financing, including domestic and through the External Commercial Borrowing route. In this light, the creation of Infrastructure Development Funds is a good step.

16. The inflows from ECB's have been rising, however such inflows have sectoral cap, end-use restrictions and interest rate cap. The cap on interest cost for ECBs makes it difficult for the borrowers to raise senior debt, subordinated debt and mezzanine debt as the maximum permissible return is not considered good enough to match the perceived risk. The risk perception of Infrastructure projects in India is high due to lower country rating and project rating issues.

Chapter SIX

ANALYSIS OF LEVERAGE EMPLOYED BY INFRASTRUCTURE COMPANIES/CORPORATE

RESULTS AND INTERPRETATION

Conceptual Background

6.1   Cost of Equity

The cost of equity is the rate of return investors require on an equity investment in a firm. The risk and return models need a riskless rate and a risk premium (in the Capital Asset Pricing Model – CAPM) or premiums (in the Arbitrage Pricing Model – APM) and multifactor models. They also need measures of a firm's exposure to market risk in the form of beta. These inputs are used to arrive at an expected return on an equity investment:

Expected Return = Riskless rate + Beta x (Market Risk Premium)

This expected return to equity investors includes compensation for the market risk in the investment, and it is the cost of equity. There are three inputs required to this model – the riskless rate, the market risk premium, and the beta of equity.

6.2   Riskless Rate

Riskless asset is defined as one for which the investor knows the expected returns with certainty. Consequently, for an investment to be riskless over a specified time period (time horizon), two conditions have to be met:

1. There is no default risk, which generally implies that the government has to issue the security. Not all governments are viewed as default free, and this does create a practical problem in obtaining riskless rates in some markets.

2. There is no uncertainty about reinvestment rates, which implies that there are no cash flows prior to the end of our time horizon, since these cash flows have to be reinvested at rates that are unknown today.

The riskless rate is the rate on a zero-coupon government bond that matches the time horizon of the cash flow being analysed.

6.3   Risk Premium

The risk premium measures the "extra return" that would be demanded by investors for shifting their money from a riskless investment to an average risk investment. It should be a function of how risk-averse investors are and how risky they perceive stocks (and other risky investments) to be, relative to a riskless investment. Because each investor in a market is likely to have a different assessment of an acceptable premium, the premium will be a weighted average of these individual premiums, where the weights will be based on the wealth the investor brings to the market.

6.3.1   Estimating Risk Premiums

There are two ways to estimate the risk premium in the CAPM. One is to look at the past and estimate the premium earned by risky investments (stocks) over riskless investments (government bonds); this is called the **historical premium**. The other is to use the premium extracted by looking at how markets price risky assets today; this is called an **implied premium**. We intend to use historical risk premiums in the study report.

Historical Risk Premiums*:* The most common approach to estimating the risk premium is to base it on historical data.   In the CAPM, the premium is estimated by looking at the difference between average returns on stocks and average returns on riskless securities over an extended period of history. One can use the arithmetic average premium arguing that it is much more consistent with the framework of the CAPM and a better predictor of the risk premium in the next period. The geometric mean is justified on the grounds that it takes into account compounding and that it is a better predictor of the average premium in the long term. There can be substantial differences in risk premiums based on the choices made at this stage. Although it is impossible to prove one premium right and the others wrong, we are biased toward:

- Longer term premiums, since stock returns are volatile and shorter time periods can provide premiums with large standard errors.

- Geometric average premiums, since arithmetic average premiums overstate the expected returns over long periods.   The geometric mean yields lower premium estimates than does the arithmetic mean and provides a more appropriate estimate for longer time horizons.

6.4   Betas

Risk in investment portfolios arise due to uncertainties. The uncertainties are caused by factors internal to a business firm or an industry and due to economy wide common factors. Risks arising due to internal factors and industry factors are called as specific risks and can be eliminated through diversification. On the other hand, there are certain risks which are common to all the assets and cannot be eliminated through diversification. The common factors are common to the entire market and hence all these factors put together is referred to as market factor. The non-diversifiable risk, therefore, is also referred to as market risk. In a competitive market investors will be rewarded for bearing the market risk only and hence market risk alone is relevant for investment and other financial decisions.

In an equity market, market risk causes the volatility in stock prices. Volatility in the values of a broad market index (proxy for the market portfolio), hence, can be said to be the indicator of the market risk. It shall be noted that though all the individual stocks are influenced by the market factor the degree of influence varies across stocks. Beta measures the relative volatility in stock prices to the volatility in the market index (refer equation 2.3).

According to CAPM beta is the appropriate measure of risk. The CAPM (equation 2.1) shows that the return an investor can expect will be equal to the riskless rate plus risk premium. The risk premium, however, will be proportional to the risk as measured by beta. Therefore, higher the beta higher will be the risk premium and lower the beta lower will be the risk premium. This relationship is explained diagrammatically in Figure 1 below. In the chart, riskless rate has been assumed to be 7 percent and hence the curve starts from 7 percent.
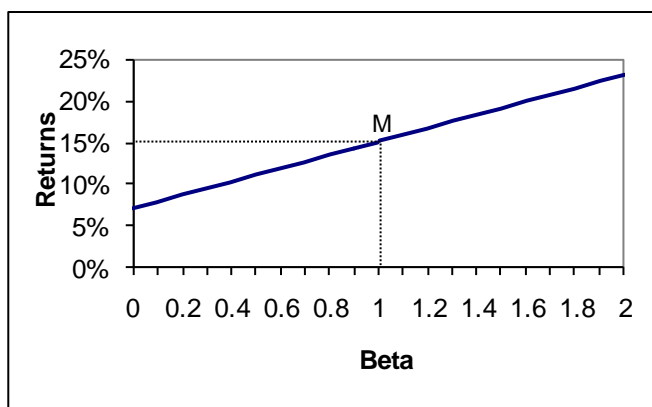
Figure 6.1: Risk-Return Relationship According to CAPM

Arbitrage Pricing Model (APM)

CAPM discussed above is based on the premise that there is only one factor that determines the risk of a security or a portfolio and the returns. Contrarily, in the real world there are many factors including the macroeconomic factors, political factors, social factors, industry factors, financial factors and the like that determine the risk and return of securities. Stephen A Ross has developed a model which takes into account the underlying factors that generate returns for a security. The model given by him is

$$E(R_i) = R_z + b_{i1}\left[E(R_1) - R_z\right] + b_{i2}\left[E(R_2) - R_z\right] + \ldots$$

Where,

E(Ri) = Expected return on security i

Rz = Return on zero-beta portfolio

[E(Ri) – Rz] = Risk premium associated with factor i

bi = Responsiveness of the stock to the changes in factor i

The term [E(Ri) – Rz] in the equation may be replaced by the symbol λ and can be expressed in a short form as

$$E(R_i) = R_z + b_i \lambda$$

Above equation is the arbitrage pricing model. As can be seen, it is a multifactor model unlike CAPM which is a single factor model. However, APM does not say what are the factors that are priced in the market and it does not suggest the number of factors that should be taken into the model. No one has found out the factors that can be used in the model. If we assume that there is only a single factor determining security returns, the APM model will become similar to CAPM and if we assume the single factor is nothing but the market factor the APM will reduce to CAPM.

CAPM, therefore, is used universally and beta is considered to be the measure of risk. Three approaches are available for estimating betas. One is to use historical data on market prices for individual investment; the second is to estimate the betas from the fundamental characteristics of the investment; and the third is to use accounting data.

6.4.1 Historical Market Betas

The conventional approach to estimating the beta of an investment is a regression of returns on the investment against returns on a market index. For firms that have been publicly traded for a length of time, it is relatively straightforward to estimate returns that an investor would have made by investing in the firm's stock each interval (such as a day, a week or a month) over that period. In theory, these stock returns on the asset should be related to returns on a market portfolio, that is, a portfolio that includes all traded assets, to estimate the betas of the assets. In practice, we tend to use a stock index, such as the BSE 100, as a proxy for the market portfolio, and we estimate betas for stocks against the index.

The standard procedure for estimating betas is to regress stock returns (R_j) against market returns (R_m).

$$R_j = a + bR_m$$

Where,

a = Intercept from the regression

b = Slope of the regression = $\dfrac{Co\,variance(R_j, R_m)}{\sigma_m^2}$

R_j = Return on security i

R_m = Return on market index

σ_m^2 = Variance (volatility) of returns of the market index

The *slope* of the regression corresponds to the beta of the stock and measures the riskiness of the stock.

Fundamental Betas

A second way to estimate betas is to look at the fundamental of the business. The beta for a firm may be estimated from a regression, but it is determined by decisions the firm has

made on what business to be in and how much operating leverage to use in the business, as well as by the degree to which the firm uses financial leverage.

The fundamental beta of a firm is determined by three variables: *(a)* the type of business or businesses the firm is in, *(b)* the degree of operating leverage of the firm, and *(c)* firm's financial leverage. Although we will use these determinants to find betas in the CAPM, the same analysis can be used to calculate the betas for the arbitrage pricing and the multifactor models as well.

Type of Business: Since betas measure the risk of a firm relative to a market index, the more sensitive a business is to market conditions, the higher its beta. Thus, other things remaining equal, cyclical firms can be expected to have higher betas than non-cyclical firms.

We can extend this view to a company's products. The degree to which a product's purchase is discretionary will affect the beta of the firm manufacturing the product. Firms whose products are much more discretionary to their customers should have higher betas than firms whose products are viewed as necessary or less discretionary.

Degree of Operating Leverage: The degree of **operating leverage** is a function of a firm's cost structure and is usually defined in terms of the relationship between fixed costs and total costs. A firm that has high fixed costs relative to total costs is said to have high operating leverage. A firm with high operating leverage will also have higher variability in operating income than would a firm producing a similar product with low operating leverage. Other things remaining equal, the higher variance in operating income will lead to a higher beta for the firm with high operating leverage.

Degree of Financial Leverage: Other things remaining equal, an increase in **financial leverage** will increase the beta of the equity in a firm. Intuitively, we would expect that the fixed interest payments on debt to result in high net income in good times and negative net income in bad times. Higher leverage increases the variance in net income and makes equity investment in the firm riskier. If all the firm's risk is borne by the stock-holders (i.e., the beta of debt is zero) and debt has a tax benefit to the firm, then

$$\beta_L = \beta_u (1 + (1-t)\frac{D}{E}$$

β_L = Levered beta for equity in the firm

β_u = Unlevered beta of the firm (i.e., the beta of the firm without any debt)

t = Corporate tax rate

$\frac{D}{E}$ = Debt/Equity Ratio

Intuitively, we expect that a leverage increases (as measured by the debt to equity ratio), equity investors bear increasing amounts of market risk in the firm, leading to higher betas. The tax in the equation captures the tax deductibility of interest payments.

The **unlevered beta** of a firm is determined by the types of businesses in which it operates and its operating leverage. It is often also called the **asset beta** because it is determined by the assets owned by the firm. Thus, the **levered beta,** which is also the beta for an equity investment in a firm, is determined both by the riskiness of the business it operates in and by the amount of financial leverage risk it has taken on.

Since financial leverage multiplies the underlying business risk, it stands to reason that firms that have high business risk should be reluctant to take on financial leverage. It is also expected that firms that operate in stable business should be much more willing to take on financial leverage. Utilities, for instance, have historically had high debt ratios but have not had high betas, mostly because their underlying businesses have been stable and fairly predictable.

6.4.3   Bottom-Up Betas

Breaking down betas into their business risk and financial leverage component provides us with an alternative way of estimating betas, in which we do not need past prices on an individual firm or asset to estimate its beta.

We can estimate the beta for a firm in four steps. First, we identify the business or businesses in which the firm operates (in this case Infrastructure). Next, we estimate the average unlevered betas of other publicly traded firms that are primarily or only in each of these businesses. Third, we take a weighted average of the unlevered betas, using the proportion of firm value derived from each business as the weights. If values are not

available, we use operating income or revenue as weights. This weighted average is called the bottom-up unlevered beta. Finally, we estimate the current market value of debt and equity at the firm and use this debt to equity ratio to estimate a levered beta. The betas estimated using this process are called **bottom-up betas.**

6.5   Estimating the Cost of Equity

Having estimated the riskless rate, the risk premium(s), and the beta(s), we can now estimate the expected return from investing in equity at any firm. In the CAPM, this expected return can be written as:

Expected Return = Riskless Rate + Beta x Expected Market Risk Premium

Where the riskless rate would be the rate on a long-term government bond, the beta would be either the historical, fundamental, or accounting betas described above, and the market risk premium would be either the historical premium or an implied premium.

6.6   Calculating the Cost of Debt

The *cost of debt* measures the current cost to the firm of borrowing funds to finance projects. In general terms, it is determined by the following variables:

1. *The current level of interest rates:* As the level of interest rates increases, the cost of debt for firms will also increase.

2. *The default risk of the company*: As the default risk of a firm increases, the cost of borrowing money will also increase.

3. *The tax advantage associated with debt*: Since interest is tax deductible, the after-tax cost of debt is a function of the tax rate. The tax benefit that accrues from paying interest makes the after-tax cost of debt lower than the pre-tax cost. Furthermore, this benefit increases as the tax rate increases.

    After tax cost of debt = Pre-tax cost of debt (1-tax rate)

Some companies choose not to get rated. Many smaller firms and most private business fall into this category. Although rating agencies have sprung up in many emerging markets,

there are still a number of markets where companies are not rated on the basis of default risk. When no rating is available to estimate the cost of debt, there are two alternatives:

1. *Evaluate Recent Borrowing History:* Many firms that are not rated still borrow money from banks and other financial institutions. By looking at the most recent borrowings made by a firm, we can get a sense of the types of default spreads being charged from the firm and use these spreads to come up with a cost of debt.

2. *Estimate a Synthetic Rating:* An alternative is to play the role of a rating agency and assign a rating to a firm based on its financial ratios; this rating is called a **synthetic rating.** To make this assessment, we begin with rated firms and examine the financial characteristics shared by firms within each ratings class.

6.7   Estimating the Cost of Capital

Since a firm can raise its money from two sources – equity and debt – the cost of capital is defined as the weighted average of each of these costs. The cost of equity (k_e) reflects the riskiness of the equity investment in the firm, the after-tax cost of debt ((k_d) is a function of the default risk of the firm. The weights on each of these components should reflect their book/ market value proportions, since these proportions best measure how the existing firm is being financed. Thus, if E and D are the market values of equity and debt respectively, the cost of capital can be written as follows:

$$\text{Cost of Capital} = K_e\left(\frac{E}{D+E}\right)+K_d\left(\frac{D}{D+E}\right)$$

(2.8)

For example, a company's capital structure, beta and tax rate were as follows:

Equity Capital (Paid up equity capital + Reserves) : Rs. 200
Borrowings (debt capital)   : 100
Cost of debt (interest on borrowings) : 10%
Beta   : 0.8
Tax rate   : 30%

Suppose, riskless rate of return is 7 percent, the market risk premium is 8 percent, the cost of equity, cost of debt and weighted average cost of capital for the company would be as below.

Cost of equity   = 7 + 0.8 x 8

                = 13.4%

Post tax cost of debt = 10 (1 - 0.3)

              = 7%

Weighted average cost of capital = 13.4 (200/100) + 7 (100/300)

                = 11.27%

Research Methodology

6.8   Data

As a first step, a list of Infrastructure service companies was obtained. The list includes 10 major publicly traded listed companies (Annexure 1).   Daily stock prices of the listed companies for a period of five years from April 1, 2009 to March 31, 2013 were collected from CAPITALINE, a corporate database. Values of BSE100 index for the same period too were obtained from CAPITALINE. BSE100 index is a broad based index of 100 large and most active stocks from across various industrial sectors listed on the Bombay Stock Exchange (BSE). In fact, till mid-1990s it was referred to as the national index. Therefore, it has been considered as a proxy for the market portfolio in the study.

Financial statements of all the listed companies for which data for the latest financial year were available in CAPITALINE, were collected from CAPITALINE.

In order to find out market risk premium riskless rate of return and market return are required. Based on the conceptual framework defined in the previous section zero coupon bonds that do not have default or reinvestment risks can qualify as riskless securities. Government of India issues bonds with different maturities and 10 year G-Sec is the most widely used security by the investors for determining the riskless rate. Yield on 10 year G-Sec were collected from Reserve Bank of India publications for a period of 15 years from April 1999 to March 2013 for the purpose of finding out the long-term average riskless rate.

To find out the market return BSE100 index has been used as a proxy for the market as explained in the conceptual framework. Values of the index for a period of 14 years starting from April 1, 2000 to March 31, 2013 were collected from CAPITALINE. Geometric average of the index return has been calculated to find out the long-term average return offered by the index. It is to be noted that the stock markets are highly volatile and offer very high returns during some years and very low returns or negative returns in some years. Therefore, there is a need for taking long-term average returns which can be said to be the minimum expected return. 14 years considered in the study is long enough to even out the impact of business cycles and short-term ups and downs in the market.

6.8.1 Estimation of Betas and Risk Premium

Universally, CAPM is widely used to calculate risk premium. According to the model returns that can be expected from an asset should be equal to riskless rate plus risk premium. The model further says that the risk premium should be proportional to the amount of risk. That is, higher the risk greater should be the risk premium and lower the risk smaller should be the risk premium.

According to CAPM, risks specific to any individual stock or industry can be eliminated through diversification. Whereas risks that are common to the entire market cannot be eliminated. Therefore, investors will be rewarded for bearing non-diversifiable risk only. Beta measures the non-diversifiable risk. It measures volatility of stock prices relative to the volatility of the market as a whole. The term 'b' in equation 2.4 is the slope coefficient (referred to as beta). Beta estimated using the equation is often referred to as regression beta.

Market risk premium multiplied by the beta of a stock will give the risk premium for the stock. As such, the risk premium for any stock will be proportional to the risk involved. For instance, if the beta of a stock is 1 the risk premium for the stock will be equal to the market risk premium. If it is less than one it will be less than the market risk premium and if it is greater than 1 it will be higher than the market risk premium.

As has been mentioned earlier, long-term average yield from 10 year G-Secs is used as the riskless rate.

A broad based, at the same time, widely used share price index is used as a proxy for the market and long-term average return of the index is used as the market return. Average return on BSE100 index has been used in the study.

Beta of listed companies can be calculated using stock prices and index values for the corresponding period.

6.8.2 Debt-Equity Norm for the Infrastructure Sector: Choosing an Optimal Capital Structure

Firms choose the mixture of debt and equity by trading-off the benefits of borrowing against the costs. There are three alternative views of how firms choose a financing mix. The first is that the choice between debt and equity is determined by where the firm is in the growth life cycle. High growth firms will tend to use debt less than mature firms. The other is that firms choose their financing mix by looking at other firms in their business. The third view is that firms have strong preferences in the kind of financing they will use that is a financial hierarchy in terms of internal financing, equity and debt in that order.

In this study we have used an approach that the ideal debt ratio will be the one that minimises the cost of capital. In this approach we estimate the cost of debt and equity at different debt ratios, use these costs to compute the cost of capital and look for the mix of debt and equity that yields the lowest cost of capital for the firm. At this cost we will argue that the firm value is maximised.

Steps in Cost of Capital Approach

We need three basic inputs to compute the cost of capital – the cost of equity, the after tax cost of debt and the weights on debt and equity. The cost of equity and debt change as the debt ratio changes.

For cost of equity we have shown earlier that the beta of equity will change as the debt ratio changes. We estimated levered beta as the function to debt to equity ratio of the firm. Thus, if we estimate the unlevered beta for a firm, we can use it to estimate the levered beta of the firm at every debt ratio.

The cost of debt for a firm is the function of the firm's default risk. As firms borrow more, their default risk will increase and so will the cost of debt. If we use debt ratings as our measure of default risk, we can estimate cost of debt in three steps:

First we estimate a firm's rupee debt and interest expenses at each debt ratio; as firms increase their debt ratio, both rupee debt and interest expenses will rise. Second at each debt level, we compute a financial ratio that measures default risk and we use the ratio to estimate the synthetic rating for a firm and again as firms borrow more the rating will decline. Third, a default spread based on estimated rating is added to the risk free rate to arrive at a pre-tax cost of debt. Applying the tax rate to this pre-tax cost yields after tax cost of debt. The tax rate to be used is the marginal tax rate. That is the rate of tax applicable to incremental profits and we have assumed a tax rate of 33.2 per cent. The ranges of interest cover, synthetic rating, default spread, rate of interest and post-tax interest rate used in the study are presented in the Table1. It may be noted that the default spread for a AAA rated corporate bond over yield on 10 year G-Sec in India is 1.00 percent (source: Fixed Income Money Market Derivatives Association of India (FIMMDA)). Average yield from 10 year G-Sec was 9.82 percent and therefore, the interest rate applicable to a AAA rated corporate bond has been taken as 10.82 percent.

Table 6.1 : Details of Synthetic Ratings and Interest Rates used in the Study

Interest cover		Synthetic Rating	Default Spread	Interest rate	Post-Tax Interest Rate
Low	High				
8.5	100000	AAA	1.00%	9.60%	6.41%
6.5	8.50	AA	1.50%	10.10%	6.75%
5.5	6.50	A+	1.65%	10.25%	6.85%
4.25	5.50	A	1.75%	10.35%	6.91%
3	4.25	A-	2.00%	10.60%	7.08%
2.5	3.00	BBB	2.85%	11.45%	7.65%
2.25	2.50	BB+	4.10%	12.70%	8.48%
2	2.25	BB	5.10%	13.70%	9.15%
1.75	2.00	B+	5.85%	14.45%	9.65%
1.5	1.75	B	6.35%	14.95%	9.99%
1.25	1.50	B-	7.10%	15.70%	10.49%
0.8	1.25	CCC	9.10%	17.70%	11.82%
0.65	0.80	CC	9.85%	18.45%	12.32%
0.2	0.65	C	10.85%	19.45%	12.99%
-100000	0.20	D	12.35%	20.95%	13.99%

Once we estimate the cost of debt and equity we weight them based on proportions used for each to estimate the cost of capital. In this, the effect of firm value of changing the capital structure is isolated by keeping the operating income fixed (no growth) or having a perpetual growth rate and varying the cost of capital. However, if operating income changes with default risk the basic analysis will not change but minimising the cost of capital may not be the optimal course of action since the value of the firm is both cash flows and cost of capital.

The value of the firm is calculated at each debt level and the optimal debt ratio is the one which maximises firm value.

6.9. Results and Interpretation

Research Question Three:

"Does restructuring correlate with high leverage that corporate employ to fund infrastructure projects?"

The increase in resorting to restructuring can be partially attributed to excessive leveraging by some borrowers during boom period. It is generally seen that the debt equity ratio of infrastructure projects is unusually high as the funding mechanism is generally "Project Finance" and higher debt may help the companies in lowering cost of capital and raising funds on project basis. The Theory will work if the Bankruptcy costs are reduced by guaranteed offtake.

Many a times the lenders face the "plums problem" (Chen, 2006) where a small project company that provides the capital has more knowledge about the project's costs and value than the government which proudly announces it, thus leading to political games, corruption and ultimately it ends up in loss. This is in contrast to the "lemons problem" (Akerlof, 70) in traditional projects where initiator of the project knows more than the bidder.

Research Question Four:

Does restructuring increase the Indirect bankruptcy costs of Infrastructure firms thereby raising their cost of equity and debt?

Key Results and Interpretation
6.9.1 Debt

Across the infrastructure sector, there has been a pile-up of debt over the last 5 years. This can be observed due to primarily two factors: Eagerness of corporates to fund capex with debt, and over-eagerness of banks to disburse loans to bloat their lending portfolios. As can be observed from the Table 6, Total Debt of the top 10 corporates in the Infrastructure sector has grown by a CAGR of 40% yoy. It has increased from Rs. 77054 crores in FY09 to Rs. 298054 crores in FY13. For some borrowers like Reliance Power, the numbers give a yoy CAGR of 113%. JP Associates is the borrower with the highest amount of debt outstanding

of Rs 63111 crore in FY13. For some companies the debt increase has outpaced the capital expenditure increase while the asset sale or deleveraging has not yet taken off. In this condition future servicing of interest payments on debt looks difficult on the account of overleveraging by the big corporate houses.

Table 6.2: Debt of Infrastructure companies

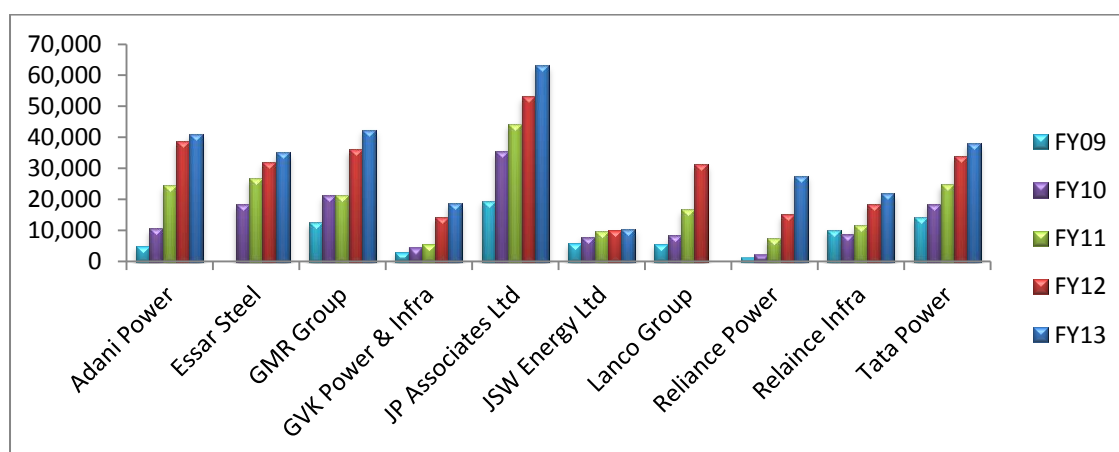|	Debt					
	FY13	**FY12**	**FY11**	**FY10**	**FY09**	**CAGR**
Adani Power	41,103	38,600	24,503	10,586	4,990	69%
Essar Steel	35,181	31,916	26,763	18,401	NA	24%
GMR Group	42,349	36,077	21,195	21,171	12,500	36%
GVK Power & Infra	18,564	14,257	5,548	4,445	2,980	58%
JP Associates Ltd	63,111	53,174	44,264	35,505	19,479	34%
JSW Energy Ltd	10,377	9,995	9,638	7,870	5,927	15%
Lanco Group	NA	31,230	16,653	8,361	5,597	77%
Reliance Power	27,511	15,065	7,334	2,241	1,332	113%
Reliance Infra	21,976	18,290	11,674	8,584	10,105	21%
Tata Power	37,882	33,860	24,742	18,447	14,143	28%
Average Debt	33,117	28,246	19,231	13,561	8,562	
Total Debt	2,98,054	2,82,464	1,92,314	1,35,612	77,054	40%

Source: Capitaline

Figure 6.1: Debt of Infrastructure companies
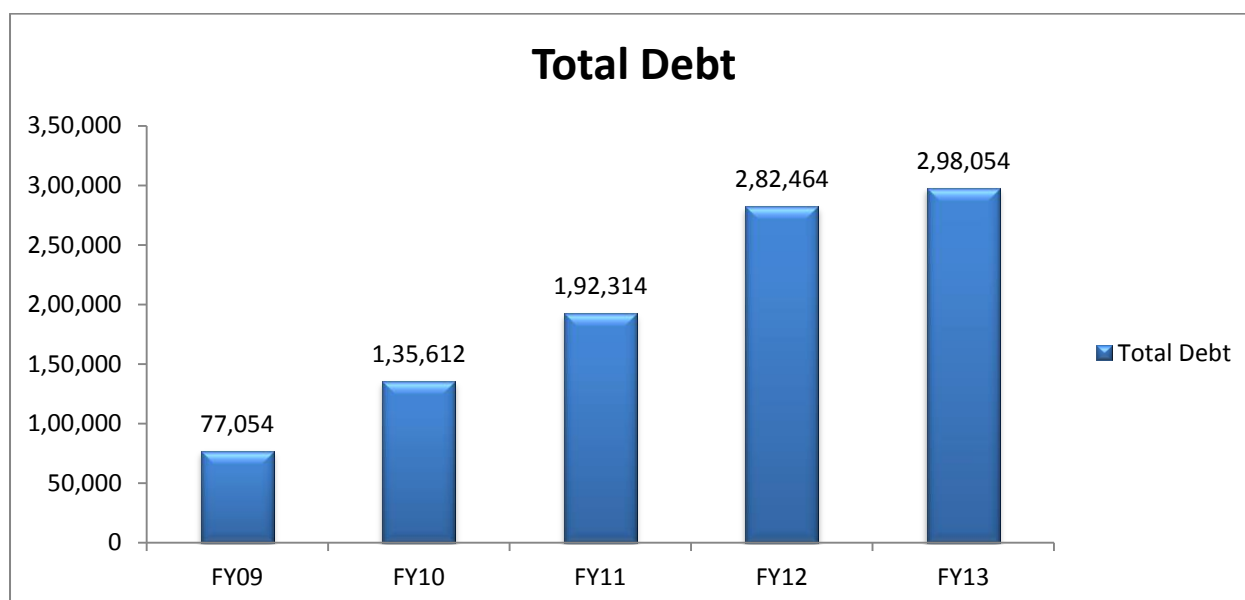
Figure 2: Total Debt of Infrastructure companies over the years

6.9.2 Interest Coverage

Interest coverage ratio measures a company's ability to service its debt obligations through scheduled interest payments. There has been a sharp fall in the interest coverage ratios across the infrastructure industry. As can be observed from Table 7, from an average ISCR of 23.72 in FY09, the ISCR of the top 10 players in the infrastructure industry has fallen to 2.03 in FY13. The sharpest fall can be seen for Reliance Power, for which the ISCR has fallen from 74.74 in FY09 to 5.05 in FY13. Essar steel looks almost on the brink of default with an ISCR of 0.08, while Tata Power has maintained a healthy ISCR of 3.51 across the 5 years of study.

Table 6.3: Interest coverage of Infrastructure companies

	Interest Coverage				
	FY13	**FY12**	**FY11**	**FY10**	**FY09**
Adani Power	0.11	0.99	3.60	6.40	0.00
Essar Steel	0.08	0.36	0.41	0.99	1.59
GMR Group	1.02	1.71	1.38	1.20	5.37
GVK Power & Infra	0.80	0.93	0.46	21.32	96.95
JP Associates Ltd	1.36	1.72	1.83	2.11	3.15
JSW Energy Ltd	3.40	1.77	4.19	4.70	6.55

Lanco Group	NA	1.21	2.24	4.64	3.91
Reliance Power	5.05	3.25	2.47	74.75	111.49
Reliance Infra	2.98	5.40	5.55	4.61	4.61
Tata Power	3.51	4.27	3.42	3.97	3.54
Average ICR	2.03	2.16	2.56	12.47	23.72
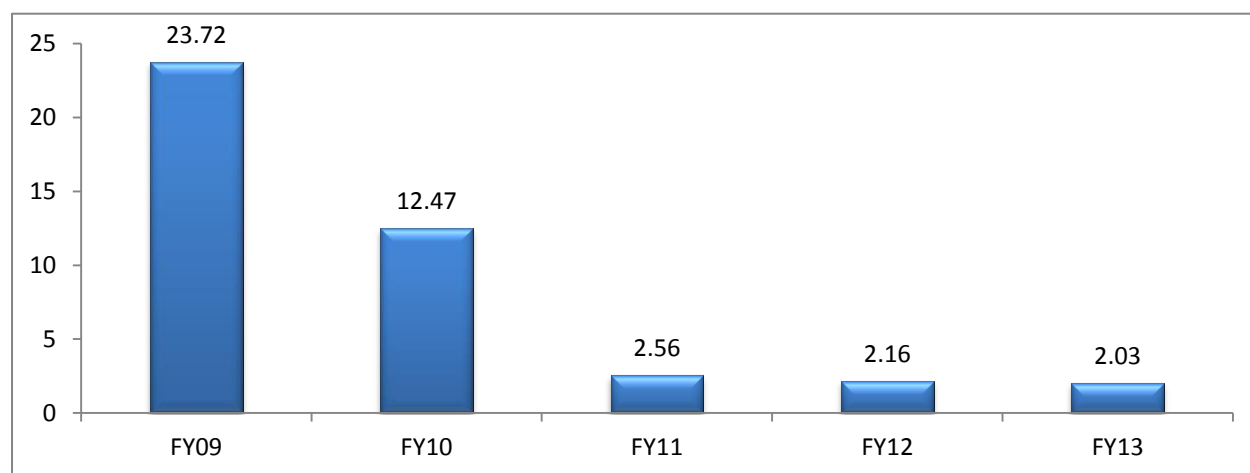
Figure 3: Interest Coverage for Infrastructure companies

6.9.3   Debt-Equity

Debt/Equity ratio measures the capital structure of a company and gives a clear picture of the proportion of capital being raised through equity and debt. As observed from Table 8, the average Debt/Equity ratio for the infrastructure industry has risen from 0.77 in FY09 to 1.47 in FY13. This indicates a jump of almost 100% over the 5-year period. It clearly points to the fact that the top 10 industry have had a major change in their capital structures over this 5 year period. They are utilizing more debt to fund their capex and working capital needs. The sharpest rise in the Debt/Equity ratio has been for Adani Power, while Reliance Infra has maintained its Debt/Equity ratio thus maintaining a stable capital structure.

Table 6.4: Debt-Equity of Infrastructure companies

	Debt/Equity				
	FY13	FY12	FY11	FY10	FY09
Adani Power	5.09	3.59	2.24	1.82	1.61
Essar Steel	3.49	2.51	2.06	1.85	1.46

GMR Group	0.50	0.37	0.38	0.26	0.08
GVK Power & Infra	0.17	0.10	0.04	0.02	0.00
JP Associates Ltd	1.80	2.00	2.27	2.13	2.00
JSW Energy Ltd	0.83	0.89	0.66	0.61	0.98
Lanco Group		1.14	0.99	0.81	0.55
Reliance Power	0.06	0.05	0.05	0.00	0.00
Reliance Infra	0.55	0.37	0.25	0.44	0.55
Tata Power	0.75	0.65	0.59	0.57	0.49
Average D/E	1.47	1.17	0.95	0.85	0.77
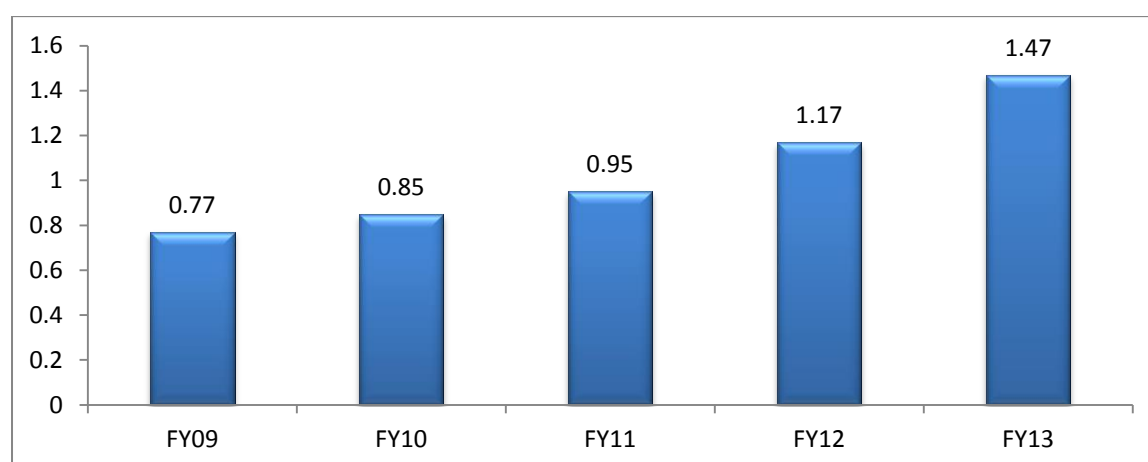
Figure 4: Debt-Equity of Infrastructure companies

6.9.4   Excess Debt

Excess Debt over capex indicates that funds being borrowed are being utilized for other purposes like working capital requirements, lease payments etc. This is a not a healthy situation for any company to be in as siphoning of debt for working capital needs is sure to get the ire of the lenders sooner than later. As observed from Table 9, the 3 corporates which have had a higher debt borrowing than their capex are Reliance Power, Essar Steel and GVK Power & Infra. Reliance power has borrowed around 40% more than its capex needs. This points to mismanagement of funds as debt is not being used to create long term assets through capex.

Table 6.5: Debt in excess of Capex for Infrastructure companies

Debt in excess of Capex			
	Capex	Change in Debt	Debt/Capex
Reliance Power	8913	12,446	140%
Essar Steel	2392	3,265	136%
GVK Power & Infra	3355	4,307	128%
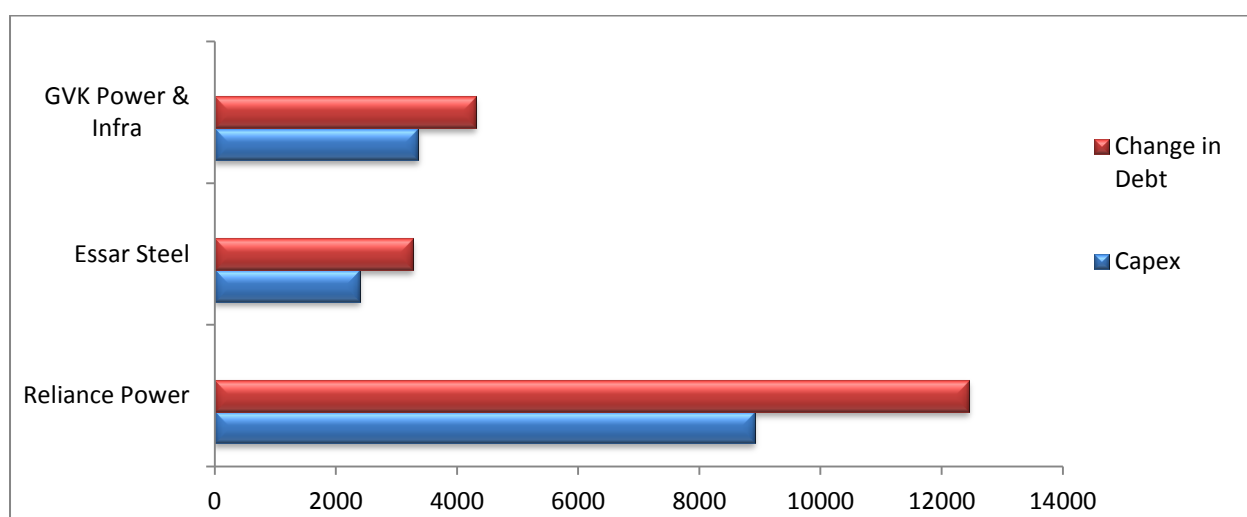
Figure 5: Debt in excess of Capex for Infrastructure companies

6.9.5 Rising Cost of Equity

Table 6.6: Cost of equity at various D/E levels

D/E Ratio	Adani	GMR	GVK	JP	JSW	Lanco	R Power	R Infra	Tata Power
0	13.85%	26.11%	30.47%	20.07%	21.83%	22.16%	30.51%	26.49%	17.97%
0.11	14.14%	27.31%	31.99%	20.82%	22.72%	23.06%	32.03%	27.71%	18.57%
0.25	14.52%	28.83%	33.92%	21.78%	23.84%	24.22%	33.97%	29.27%	19.33%
0.43	15.01%	30.79%	36.41%	23.02%	25.28%	25.70%	36.46%	31.27%	20.32%
0.67	15.78%	33.93%	40.39%	24.99%	27.60%	28.08%	40.44%	34.48%	21.89%

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1	17.00%	38.85%	46.62%	28.09%	31.22%	31.80%	46.69%	39.51%	24.35%
1.5	18.84%	46.32%	56.09%	32.79%	36.74%	37.46%	56.18%	47.16%	28.09%
2.53	22.53%	61.22%	74.98%	42.16%	47.72%	48.75%	75.11%	62.40%	35.54%
4	27.87%	82.83%	102.37%	55.76%	63.65%	65.11%	102.55%	84.50%	46.36%
9	45.92%	155.83%	194.92%	101.69%	117.48%	120.39%	195.27%	159.18%	82.89%

As observed from Table above, average cost of equity at the minimum WACC level for the 10 infrastructure companies is 27.48%. This has increased considerably due to the amount of debt these companies are carrying. **Therefore, by using a highly levered capital structure though the firms are trying to minimize their cost of capital by borrowing cheaper debt, the overall cost of capital is not getting reduced as the cost of equity is also increasing due to increased bankruptcy risk. We can see this clearly from Figure 7.**

Thus we see that the assumption of constant and cheap cost of equity is flawed and cost of equity will also rise at high debt levels to offset the gains made by borrowing cheaper debt. Cost of equity is very high for companies like Reliance Power (36.46%) and GVK Infra and Power (36.41%), while it is low for companies like Adani Power (14.14%) at the minimum WACC level.
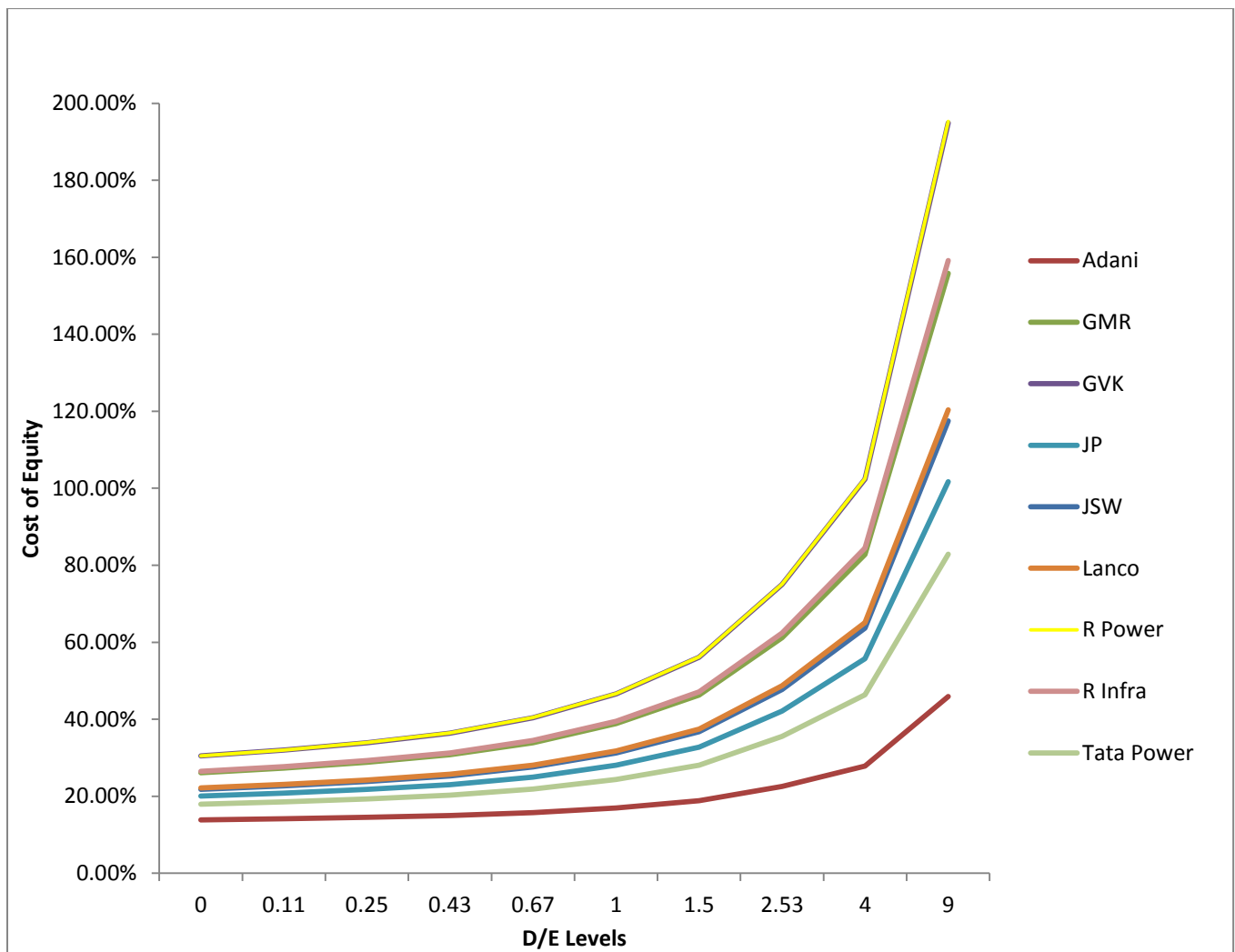
Figure 6: Cost of equity at various D/E Levels

6.9.6 Beta of Listed Companies

Regression beta of listed Infrastructure companies for the last five years and average beta are presented in Table 6.7. The results given in the table clearly show that the betas do not remain stable. Many research studies have been conducted on the behaviour of beta both in India and other markets. The studies too have found that the betas do not remain constant. The reason for the volatility could be several including sector specific developments and company specific developments. Sector specific developments include growth, competition, etc. Company specific developments would include business profile, profitability, diversification of business, changes in the proportion of debt capital, etc. Due to these reasons, one can believe that the beta for the latest year is likely to reflect the risk in the future and be closer to the future beta. Therefore, we recommend that the beta for the year 2013 shall be taken as the measure of risk.

Table 6.7 presents the beta of ten listed companies. Amongst them GVK Power and Infra Ltd has the highest beta of 2.18 during 2013 followed by JP Associates with 2.14, GMR and Lanco Group at 2.06, Reliance Power at 2.04 and so on. The company with the lowest beta is Tata Power (1.16). The average for the industry works out to 1.92 which is quite high indicating high risk involved in the sector. The betas of the listed companies for the year 2013 are shown graphically in Figure 7.

Table 6.7: Beta of Listed companies

Name of Company	Annual Beta					Average Beta
	2009	2010	2011	2012	2013	
Adani Power	NA	0.29	0.68	1.11	1.68	0.94
Essar Steel	NA	NA	NA	NA	NA	NA
GMR Group	1.07	1.16	1.17	1.30	2.06	1.35
GVK Power & Infra	1.07	1.29	1.14	1.45	2.18	1.43
JP Associates Ltd	1.76	1.55	1.66	1.88	2.14	1.80
JSW Energy Ltd	NA	1.08	0.72	1.19	1.77	1.19
Lanco Group	1.45	1.59	1.17	1.61	2.06	1.58
Reliance Power	1.03	1.02	1.03	1.29	2.04	1.28
Reliance Infra	1.68	1.40	1.21	1.43	2.16	1.58
Tata Power	0.98	0.75	0.63	0.93	1.16	0.89
Average	1.29	1.13	1.05	1.35	1.92	1.34

Note: NA = Data not available. These companies might have come into existence or been listed on the stock exchanges after this year(s).
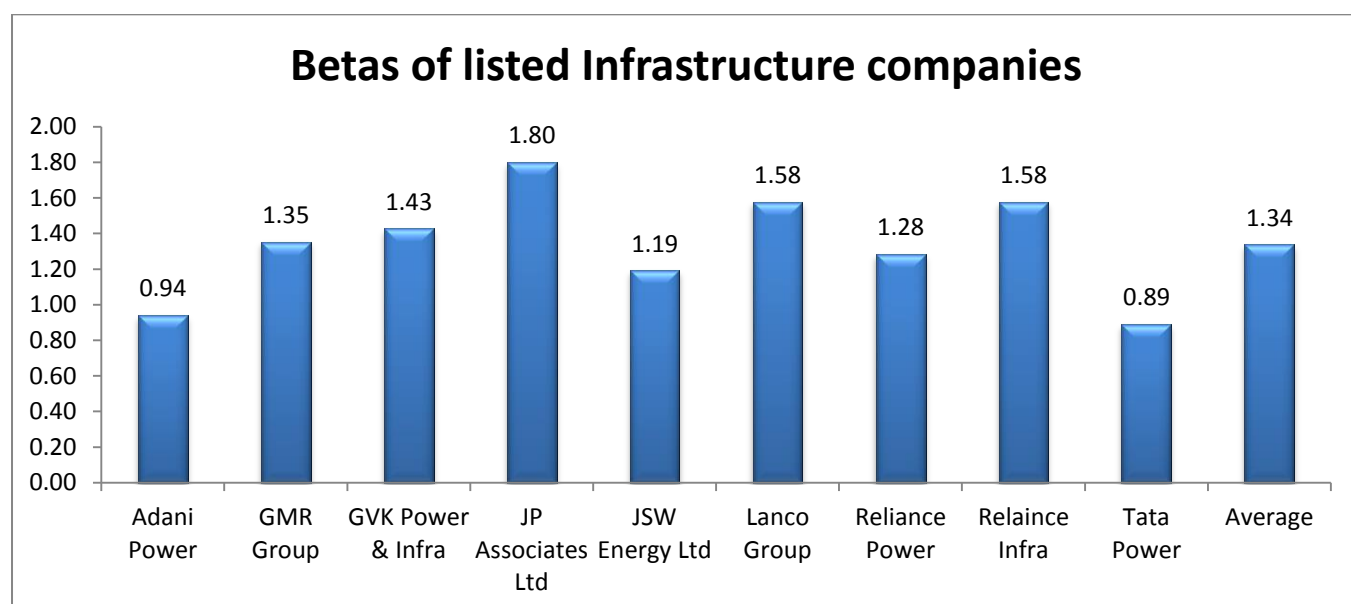

Figure 7: Beta of Listed Infrastructure companies

Market Risk Premium

As has been mentioned under methodology, BSE100 index has been considered as the proxy for the market and 10 year G-Sec has been used as the proxy for riskless asset. The long-term average return offered by BSE100 index was 12.18 per cent. This is the return arising out of price change and can be called as capital gains. To this dividend yield shall be added. We have assumed a market return of 15 per cent taking both capital gain and dividend yield into account. The long-term average yield from 10 year G-Sec was 9.82 per cent. Thus, the market risk premium works out to 10.55 per cent.

Risk Premium For Listed Companies

Market risk premium multiplied by beta of individual companies will give risk premium of the companies concerned. Market risk premium is 10.55 per cent as has been mentioned in the previous paragraph. In our opinion, beta for the latest year should be considered. Accordingly, beta of the listed companies for the year 2013 and their risk premium are presented in Table . The table shows that the risk premium is high for the companies with high betas and low for the companies with low betas. Accordingly, the investors would expect the highest premium from GVK Power and Infra (23%) and the lowest premium from Tata Power (12.23%). For graphical description of risk premium Figure 8 may be referred. The average risk premium works out to 20.22 percent.

Table 6.8: Beta and Risk Premium of Listed Infrastructure Companies

Name of Company	Beta (for the year 2013)	Risk Premium
Adani Power	1.68	17.72%
GMR Group	2.06	21.73%
GVK Power & Infra	2.18	23.00%
JP Associates Ltd	2.14	22.58%
JSW Energy Ltd	1.77	18.67%
Lanco Group	2.06	21.73%
Reliance Power	2.04	21.52%
Reliance Infra	2.16	22.75%
Tata Power	1.16	12.23%

Average	1.02	20.22%
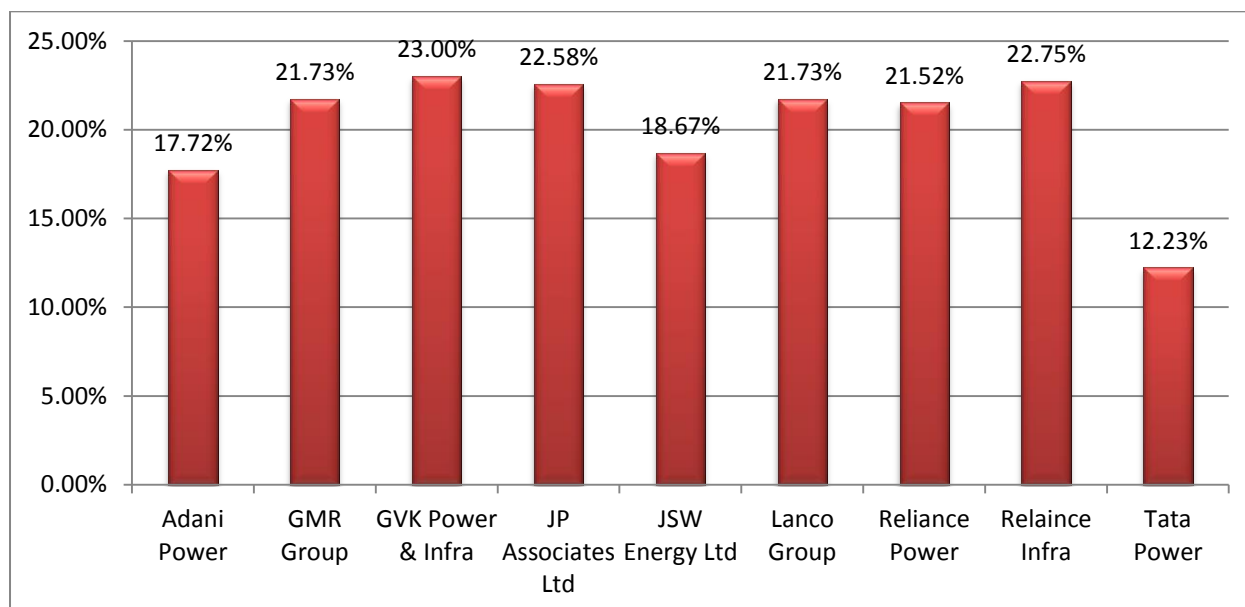
Figure 8: Risk Premium of Listed Infrastructure Companies

Unviable External Commercial Borrowing and Rising Hedging Costs

Yields across the board, including that of US treasuries, have risen more than a percentage point in the past two months. Foreign portfolio flows in both equities and debt have turned negative after nearly a year of inflows, deteriorating the outlook on the rupee and boosting the cost of hedging. The advantage of raising money abroad is slowly fading due to the rising cost of hedging against currency volatility and declining interest rates in the domestic market.

According to RBI norms, companies cannot pay more than LIBOR plus 500 basis points for an external commercial borrowing. For a AAA rated company, a US dollar loan may now cost more than 10%, given the market interest rate and hedging costs. That makes borrowing in Indian Rupees cheaper.

With the Federal Reserve poised to taper bond purchases by the end of the year, interest rates are climbing. The yield on benchmark 10-year US treasuries is projected to rise to 4% from 2.5% now. In fiscal 2012-13, ECBs formed the largest chunk of India's external debt. Indian companies borrowed $121 billion through the ECB route.

Analysis
Forward Rate (USD/INR) on 13th September 2013

MONTH	RATE
31 Aug 13	66.3125
30 Sep 13	63.8850
31 Oct 13	64.4200
30 Nov 13	64.9100
31 Dec 13	65.3950
31 Jan 14	65.8400
28 Feb 14	66.2000
31 Mar 14	66.5600
30 Apr 14	66.9750
31 May 14	67.2850
30 Jun 14	67.6050
31 Jul 14	67.9250

Source: Moneycontrol.com
Spot Exchange Rate (USD/INR) on 13th September 2013 – **63.625**

Cost of Hedging = (67.925/63.625-1)*100
           = 6.76%

The price of forward contracts that fix the conversion rate for buying dollars with rupees in a year is at an annualised 6.76% over the spot, the most since May 2011, Bloomberg data shows. Adjusted for this, it makes little sense to borrow overseas.

Indian corporates raised money in the US market at interest rates ranging between 4.5% and 5%. If a corporate has to hedge the loan against currency fluctuation, its cost of borrowing increases to 11%. Against this, the cost of borrowing in the domestic market for the best-rated (AAA-rated) bonds ranges from 8.8% to 9% for long-term bonds. However at base rates, it almost matches, term loan rates, so no arbitrage is possible.

Final Conclusions and Recommendation after investigation into Corporate Leverage: Challenges of Restructuring

1. It is clear that the above sample of Infrastructure companies in India have leveraged their balance sheets much above the optimum debt taking capacities on a given level of cash flows and assets.

2. When we use Project Finance believing that Risk structuring and allocation can minimize increased risk of assets, it cannot essentially work in projects with flawed economics and politically sensitive macro environments as offtake of cash flows become volatile.

3. Therefore, this volatility in cash flows has resulted in higher Bankruptcy costs, which has resulted in a rise in higher risk premiums leading to higher cost of equity and debt. Needless to say, that then the Weighted Average Cost of Capital has also risen. Now if this increased Cost of Capital is used as a discount rate, many infrastructure projects may become unviable for promoters in terms of Equity IRR and Project IRR.

4. This means that with this rise in Cost of Equity, it may not be feasible for the promoters of these companies to raise further equity from the market. Thus Projects may be debt driven in future as well.

5. Therefore in the present situation, the corporate is increasingly resorting to a behavior called as "Risk Shifting" whereas the incentive to shift risk of riskier assets to debt providers will rise. They keep on hoping for the upside on riskier assets (thus more and more riskier assets are built on overleveraged balance sheets) and in the present situation, it may be difficult get that upside.

6. This is more apparent when corporate often bid high for projects which are risky with uncertain cash flows and then ask for sweeteners from the Government.

7. However, all of this may still work out in favour, if the cash flows from the stalled projects start flowing and therefore the role of Government and Various sectoral regulatory authorities become important. It is important to note here that even if there is a delay in project achieving start of commercial operations, it leads to delayed cash flow buildup leading to stress for both debt and equity providers.

8. Lastly, this is one sector which faces severe manpower shortage for engineers who specialize in Construction and Project Management. This often results in confusion

over the fixing up of Declared Commencement of Commercial operations date (DCCO). A good Project Manager may try to use several techniques to complete the project in time. Asset classification in banks are linked to DCCO, and this often a problem for bankers if DCCO is changed on account of inadequacies in Project Management.

Annexure 6.1

Table 1: List of Sample Infrastructure Companies in India

Synod.	Company
Listed Companies	
1	Adani Power
2	Essar Steel
3	GMR Group
4	GVK Power & Infra
5	JP Associates Ltd
6	JSW Energy Ltd
7	Lanco Group
8	Reliance Power
9	Reliance Infra
10	Tata Power

Source: CAPITALINE

Annexure 2:
Summary of Workings on Optimal Capital Structure for Listed Infrastructure Companies

Adani Power

D/E Ratio	Beta	Cost of Equity	Interest	Interest Coverage	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC
0	0.38	13.85%	0.00	NA	AAA	9.60%	33.20%	6.41%	13.85%
0.11	0.41	14.14%	37.13	5.09	A	10.35%	33.20%	6.91%	13.43%
0.25	0.45	14.52%	84.39	2.24	BB	13.70%	33.20%	9.15%	13.45%
0.43	0.49	15.01%	145.15	1.30	B-	15.70%	33.20%	10.49%	13.65%
0.67	0.57	15.78%	226.17	0.84	CCC	17.70%	28.37%	12.68%	14.54%
1	0.68	17.00%	337.56	0.56	C	19.45%	21.82%	15.21%	16.10%
1.5	0.86	18.84%	506.34	0.37	C	19.45%	17.30%	16.09%	17.19%
2.53	1.20	22.53%	854.03	0.22	C	19.45%	14.82%	16.57%	18.26%
4	1.71	27.87%	1350.24	0.14	D	20.95%	12.97%	18.23%	20.16%
9	3.42	45.92%	3038.04	0.06	D	20.95%	11.53%	18.53%	21.27%

GMR Group

D/E Ratio	Beta	Cost of Equity	Interest	Interest Coverage	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC
0	1.54	26.11%	0.00	NA	AAA	9.60%	33.20%	6.41%	26.11%
0.11	1.66	27.31%	98.54	4.64	A	10.35%	33.20%	6.91%	25.29%
0.25	1.80	28.83%	223.96	2.04	BB	13.70%	33.20%	9.15%	24.90%
0.43	1.99	30.79%	385.21	1.19	CCC	17.70%	33.20%	11.82%	25.09%
0.67	2.29	33.93%	600.21	0.76	CC	18.45%	28.37%	13.22%	25.62%
1	2.75	38.85%	895.84	0.51	C	19.45%	21.82%	15.21%	27.03%
1.5	3.46	46.32%	1343.76	0.34	C	19.45%	17.30%	16.09%	28.18%
2.53	4.87	61.22%	2266.48	0.20	C	19.45%	14.82%	16.57%	29.22%
4	6.92	82.83%	3583.37	0.13	D	20.95%	12.97%	18.23%	31.15%
9	13.84	155.83%	8062.59	0.06	D	20.95%	11.53%	18.53%	32.26%

GVK Power & Infra

D/E Ratio	Beta	Cost of Equity	Interest	Interest Coverage	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC
0	1.96	30.47%	0.00	NA	AAA	9.60%	33.20%	6.41%	30.47%
0.11	2.10	31.99%	33.81	1.24	CCC	17.70%	33.20%	11.82%	29.99%
0.25	2.28	33.92%	76.84	0.54	C	19.45%	33.20%	12.99%	29.74%
0.43	2.52	36.41%	132.16	0.32	C	19.45%	33.20%	12.99%	29.37%
0.67	2.90	40.39%	205.93	0.20	C	19.45%	28.37%	13.93%	29.77%
1	3.49	46.62%	307.35	0.14	D	20.95%	21.82%	16.38%	31.50%
1.5	4.39	56.09%	461.03	0.09	D	20.95%	17.30%	17.33%	32.83%
2.53	6.18	74.98%	777.60	0.05	D	20.95%	14.82%	17.85%	34.03%
4	8.77	102.37%	1229.41	0.03	D	20.95%	12.97%	18.23%	35.06%
9	17.55	194.92%	2766.18	0.02	D	20.95%	11.53%	18.53%	36.17%

JP Associates Ltd

D/E Ratio	Beta	Cost of Equity	Interest	Interest Coverage	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC
0	0.97	20.07%	0.00	NA	AAA	9.60%	33.20%	6.41%	20.07%
0.11	1.04	20.82%	128.24	22.25	AAA	9.60%	33.20%	6.41%	19.40%
0.25	1.13	21.78%	291.46	9.79	AAA	9.60%	33.20%	6.41%	18.71%
0.43	1.25	23.02%	501.32	5.69	A+	10.25%	33.20%	6.85%	18.15%
0.67	1.44	24.99%	781.12	3.65	A-	10.60%	28.37%	7.59%	18.01%
1	1.73	28.09%	1165.85	2.45	BB+	12.70%	21.82%	9.93%	19.01%
1.5	2.18	32.79%	1748.77	1.63	BB+	12.70%	17.30%	10.50%	19.42%
2.53	3.07	42.16%	2949.60	0.97	CCC	17.70%	14.82%	15.08%	22.75%
4	4.35	55.76%	4663.40	0.61	C	19.45%	12.97%	16.93%	24.69%
9	8.71	101.69%	10492.65	0.27	C	19.45%	11.53%	17.21%	25.66%

JSW Energy Ltd

D/E Ratio	Beta	Cost of Equity	Interest	Interest Coverage	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC
0	1.14	21.83%	0.00	NA	AAA	9.60%	33.20%	6.41%	21.83%
0.11	1.22	22.72%	70.77	25.65	AAA	9.60%	33.20%	6.41%	21.10%
0.25	1.33	23.84%	160.85	11.29	AAA	9.60%	33.20%	6.41%	20.35%
0.43	1.47	25.28%	276.66	6.56	AA	10.10%	33.20%	6.75%	19.71%
0.67	1.69	27.60%	431.07	4.21	A-	10.60%	28.37%	7.59%	19.57%
1	2.03	31.22%	643.38	2.82	BBB	11.45%	21.82%	8.95%	20.09%
1.5	2.55	36.74%	965.08	1.88	B+	14.45%	17.30%	11.95%	21.86%
2.53	3.59	47.72%	1627.76	1.12	CCC	17.70%	14.82%	15.08%	24.32%
4	5.10	63.65%	2573.54	0.71	CC	18.45%	12.97%	16.06%	25.58%
9	10.21	117.48%	5790.46	0.31	C	19.45%	11.53%	17.21%	27.24%

Lanco Group

D/E Ratio	Beta	Cost of Equity	Interest	Interest Coverage	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC
0	1.17	22.16%	0.00	NA	AAA	9.60%	33.20%	6.41%	22.16%
0.11	1.26	23.06%	48.72	12.54	AAA	9.60%	33.20%	6.41%	21.41%
0.25	1.36	24.22%	110.74	5.52	A+	10.25%	33.20%	6.85%	20.74%
0.43	1.51	25.70%	190.47	3.21	A-	10.60%	33.20%	7.08%	20.10%
0.67	1.73	28.08%	296.77	2.06	BB	13.70%	28.37%	9.81%	20.75%
1	2.08	31.80%	442.95	1.38	B-	15.70%	21.82%	12.27%	22.04%
1.5	2.62	37.46%	664.42	0.92	CCC	17.70%	17.30%	14.64%	23.77%
2.53	3.69	48.75%	1120.65	0.55	C	19.45%	14.82%	16.57%	25.68%
4	5.24	65.11%	1771.78	0.34	C	19.45%	12.97%	16.93%	26.56%
9	10.48	120.39%	3986.52	0.15	D	20.95%	11.53%	18.53%	28.72%

Reliance Power

D/E Ratio	Beta	Cost of Equity	Interest	Interest Coverage	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC
0	1.96	30.51%	0.00	NA	AAA	9.60%	33.20%	6.41%	30.51%
0.11	2.11	32.03%	194.38	2.75	BBB	11.45%	33.20%	7.65%	29.62%
0.25	2.29	33.97%	441.78	1.21	CCC	17.70%	33.20%	11.82%	29.54%
0.43	2.52	36.46%	759.87	0.70	CC	18.45%	33.20%	12.32%	29.20%
0.67	2.90	40.44%	1183.98	0.45	C	19.45%	28.37%	13.93%	29.81%
1	3.49	46.69%	1767.13	0.30	C	19.45%	21.82%	15.21%	30.95%
1.5	4.39	56.18%	2650.69	0.20	C	19.45%	17.30%	16.09%	32.12%
2.53	6.19	75.11%	4470.84	0.12	D	20.95%	14.82%	17.85%	34.07%
4	8.79	102.55%	7068.51	0.08	D	20.95%	12.97%	18.23%	35.10%
9	17.58	195.27%	15904.16	0.03	D	20.95%	11.53%	18.53%	36.21%

Reliance Infra

D/E Ratio	Beta	Cost of Equity	Interest	Interest Coverage	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC
0	1.58	26.49%	0.00	NA	AAA	9.60%	33.20%	6.41%	26.49%
0.11	1.70	27.71%	202.86	14.90	AAA	9.60%	33.20%	6.41%	25.60%
0.25	1.84	29.27%	461.04	6.56	AA	10.10%	33.20%	6.75%	24.76%
0.43	2.03	31.27%	793.00	3.81	A-	10.60%	33.20%	7.08%	24.00%
0.67	2.34	34.48%	1235.60	2.45	BB+	12.70%	28.37%	9.10%	24.30%
1	2.81	39.51%	1844.18	1.64	B	14.95%	21.82%	11.69%	25.60%
1.5	3.54	47.16%	2766.27	1.09	CCC	17.70%	17.30%	14.64%	27.65%
2.53	4.98	62.40%	4665.77	0.65	CC	18.45%	14.82%	15.72%	28.94%
4	7.08	84.50%	7376.72	0.41	C	19.45%	12.97%	16.93%	30.44%
9	14.16	159.18%	16597.61	0.18	D	20.95%	11.53%	18.53%	32.60%

Tata Power

D/E Ratio	Beta	Cost of Equity	Interest	Interest Coverage	Bond Rating	Interest rate on debt	Tax Rate	Cost of Debt (after-tax)	WACC
0	0.77	17.97%	0.00	NA	AAA	9.60%	33.20%	6.41%	17.97%
0.11	0.83	18.57%	99.52	23.93	AAA	9.60%	33.20%	6.41%	17.37%
0.25	0.90	19.33%	226.18	10.53	AAA	9.60%	33.20%	6.41%	16.75%
0.43	0.99	20.32%	389.02	6.12	A+	10.25%	33.20%	6.85%	16.27%
0.67	1.14	21.89%	606.15	3.93	A-	10.60%	28.37%	7.59%	16.15%
1	1.38	24.35%	904.70	2.63	BBB	11.45%	21.82%	8.95%	16.65%
1.5	1.73	28.09%	1357.05	1.76	B+	14.45%	17.30%	11.95%	18.41%
2.53	2.44	35.54%	2288.90	1.04	CCC	17.70%	14.82%	15.08%	20.87%
4	3.46	46.36%	3618.81	0.66	CCC	17.70%	12.97%	15.40%	21.59%
9	6.93	82.89%	8142.32	0.29	C	19.45%	11.53%	17.21%	23.78%

Chapter SEVEN

Role of Public Private Partnership (PPP) and Government

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. Several initiatives have been taken to accelerate the pace of project implementation under the PPP. 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.

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. The reasons for this is largely lack of Budgetary Resources, Inability of Government departments to often align incentives, Expertise of the Private sector to reduce life cycle costs of the projects, availability of large and hybrid financing instruments from a fairly well developed financial markets and technological advancements which has made unbundling of services easy in this sector.

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. 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.

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

In India also, the recourse to the PPP model will go a long way to bridge the infrastructure gap. 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.

However, in the case of most infrastructure services, it is difficult to price them fully to cover all costs. The greater the element of public good and the difficulty of exclusion and pricing a service, the higher is the likelihood that the service would be provided by the public sector and financed by some form of tax revenues.

Also, infrastructure provision usually involves high up-front costs and long pay-back periods. Investments tend to be typically bulky and lumpy. This has two implications. First, the investor has to have large initial capital. Second, in view of the long pay-back period, he has to be capable of obtaining matching long-term finance. Moreover, since infrastructure sectors have to be heavily regulated because of their monopoly characteristics, there is high risk attached to such investments due to uncertainties involved in regulation and pricing.

Infrastructure projects are generally conceived and implemented on the basis of a meaningful partnership between the public (which includes the governments) and the private sectors. Though the degree of public involvement varies, depending upon the nature and requirements of individual projects, it is essential that the government or its department concerned should take proactive steps in building up a partnership with private project sponsors. In many countries, public services constitute state monopolies or are otherwise subject to special regulation by the government. Where that is the case, the provision of a public service by a private entity typically requires an act of authorization by the appropriate state body. Different expressions are used to define such acts of

authorization. The commonly used expressions include terms such as 'concession', 'franchise', or 'licence'. This research uses the word 'concession' to refer generally to the right given to the Project Company or consortium to construct and operate or only to operate the public infrastructure facility and to charge for its use or for the services it renders (generates).

Approaches to Private Participation: Though there seems to be a consensus among public policy makers and a growing realization for the need for increased public-private participation in infrastructure projects, the issues regarding the approach to be followed for involvement of the private sector remains unresolved. Clearly, there cannot be any single scheme or one-rule-fit-all formula to suit different needs and circumstances. Whatever the approach followed, it will necessarily stem from political commitments and/or pressures, the transition path to be pursued, institutional capabilities, competitive policies, governmental intervention, sector specific features, etc. Based on experimentation over a period of time, countries are pursuing their public-private participation initiative under a variety of schemes.

The paragraphs below discuss the following three main variants: (*i*) public ownership and operation, (*ii*) public ownership and private operation, and (*iii*) private ownership and operation. The appropriateness of a particular variant for a given type of infrastructure is a matter to be considered by the government in view of the national needs and an assessment of the most efficient way in which the particular type of infrastructure may be developed and operated. In a particular sector more than one option may be used, so these options are not mutually exclusive.

Public Ownership and Operation: The traditional mode of infrastructure provision, with the government being both the owner and the operator of the infrastructure, offered limited or no scope for private sector participation. However, some countries have devised mechanisms for attracting direct private financing or for facilitating the operation of public infrastructure under commercial principles. One way that a government can achieve the desired objective is by establishing a separate legal entity, such as a joint stock company, controlled by the government but managed as an independent commercial enterprise, subject to the same rules and business principles that apply to private companies. Some

countries have a well-established tradition in operating national infrastructure through these types of companies. Opening the capital of such companies to private investment, or making use of such a company's ability to issue bonds or other security may create an opportunity for attracting private investment in infrastructure. Some of these companies have been used as a Special Purpose Vehicle (SPV) for raising private funds for infrastructure investment *via* the project finance mode. In the Indian context, this model is being widely followed in railways, irrigation projects, power and road finance, etc. The Konkan Railway Corporation Ltd. could be cited as a specific example.

Another form of involving private participation in publicly-owned and operated infrastructure may be through the negotiation of service contracts whereby the public operator contracts out specific operations and maintenance activities to the private sector. The host government may also entrust a broad range of operations and maintenance activities to a private entity acting on behalf of the relevant public authority. Under this arrangement, which is sometimes referred to as a 'management contract', the private operator's compensation may be linked to his performance, often through a profit-sharing mechanism, although compensation on the basis of a fixed fee may also be used, particularly where the parties find it difficult to establish mutually acceptable mechanisms to assess the operator's performance.

Public Ownership and Private Operation: There are various ways in which the entire operation of the public infrastructure may be transferred to private entities. One of the possibilities is to give the private entity, usually for a certain period, the right to use a given infrastructure, to supply the relevant services and to collect the revenue generated by that activity. Such infrastructure may already be in existence, or may have been especially built by the private entity concerned. This combination of public ownership and private operation has the essential features of arrangements, which in some legal systems may be referred to as 'public works concessions' or 'public services concessions'.

Another form of private participation in infrastructure is where a private entity is selected by the host government to operate a facility which has been built by or on behalf of the government, or whose construction has been financed with public funds. Under such an arrangement, the operator assumes the responsibility of operating and maintaining the

infrastructure and he is granted the right to charge for the services he provides. In such a case, the operator is responsible for paying to the government a portion of the revenue generated by the infrastructure, which is used by the government to amortize the construction cost. Such arrangements are referred to in some legal systems as 'lease'.

Private Ownership and Operation: Under the third option, the private entity not only operates the infrastructure, but also owns the assets related to it. Here, too, there may be substantial differences in the treatment of projects under national laws, for instance, whether the government retains the right to reclaim the title to the infrastructure or to assume the responsibility for its operation and so on.

Where the infrastructure is operated pursuant to a governmental licence, private ownership of physical assets (e.g. telecommunication network) is often separable from the licence to provide the service to the public (e.g. long-distance telephone services). In such cases, the licence can be withdrawn by the government under certain circumstances. Thus, private ownership of the infrastructure may not necessarily entail an indefinite right to provide the service.

While the above three modes can be considered as broad approaches to the private participation in infrastructure, in terms of the actual strategies that are being pursued world over, these can assume any of the following arrangements.

Build-Operate-Transfer (BOT):   Under this approach, promoters under a well-structured agreement with the government for concessions, build, operate and maintain the infrastructure facility. During the life of the concession, promoters collect fees from the users towards the project cost, debt servicing and its operation.   At the end of the concession period, the infrastructure asset is transferred back to the government or to the public authority. This approach is often adopted in the development of highways and ports. For example, Madhya Pradesh Tolls Ltd – a joint venture company of Infrastructure Leasing and Financial Services Ltd and the Madhya Pradesh State Industrial Development Corporation – operates a road project under this approach. **The Design Build Finance Operate and Transfer (DBFOT) is a variation of traditional BOT.**

Build-Own-Operate (BOO): This is on the lines of BOT except that the infrastructure asset is never transferred to the government. This approach has been adopted around the world for building power plants, telecom projects and wastewater treatment plants.

Build-Own-Operate-Transfer (BOOT): This is also on the lines of BOT. After the negotiated period of time, the infrastructure asset is transferred to the government or to the private operator. This approach has been used for the development of highways and ports. The proposed Rs. 4,800 crore Elevated Light Rail Transit System (ELRTS) in Bangalore is to be run on BOOT basis over a 30-year concession period.

Build-Operate-Lease-Transfer (BOLT): The "Own Your Wagon" scheme run by Indian Railways is a variant of BOLT under which a set of wagons, purchased by private parties, is leased to Railways on fixed rentals.

Lease-Develop-Operate (LDO): Under this approach, the government/public sector retains ownership of an existing infrastructure facility and receives payments in terms of a lease agreement with the private promoter. This approach has been followed in the development of airport facilities.

Rehabilitate-Operate-Transfer (ROT): Under this approach, the governments/local bodies allow private promoters to rehabilitate and operate a facility during a concession period, after which it is transferred back to governments/local bodies. This approach is followed in urban water and sewage systems.

Management contract: Private promoters assume the responsibility for a full range of investment, operation and maintenance functions with the authority to make day-to-day management decisions under a profit-sharing or fixed-fee arrangement.

Service contract: This approach is more narrowly focused than the management contract. In this approach, the private promoter performs a particular operational or maintenance function for a fee over a specified period of time

The current slowdown

The present economic downturn as well as the increase in overall construction cost has pushed a majority of the private sector infrastructure companies (that the banks were financing) to a tight liquidity position. Some of the companies are on the verge of collapse due to reasons such as aggressive bidding, absence of traffic revenue as projected, delays in land acquisition, hurdles encountered in obtaining environmental clearances and utility shifting and failure to hand over Right of Way (ROW) by the Government on time. Other concerns of companies include delays in honoring price variations, escalations, change of scope etc. The Gross NPAs and restructured standard advances for the infrastructure sector, together as a percentage of total advances to the sector, has increased considerably from Rs. 121.90 bn (4.66%) as at the end of March 2009 to Rs.1369.70 bn (17.43%) as at the end of March 2013.

On account of issues concerning all stakeholders, there is a slowdown in the Infrastructure investment through PPP.

Table 7.1: Slow down in PPP

	2010 -11		2011 -12	
	No. of Projects	Total Investment (Billion Re)	No. of Projects	Total Investment (Billion Re)
Power	107	1840	92	933
Telecom	2	214	1	-
Ports and Airports	2	57	1	25
Total Infrastructure	124	2152	118	1029

Final Conclusion and Recommendations after investigating role of Public Private Partnership and Government

1. There should be a clear picture of economics and Physicals of the projects.

2. Land identification should be done by Government and acquisition price to be indicated to the bidder at the project bidding stage. The Letter of Acceptance (LOA) should be issued to bidders and contractors only when land acquisition is complete in all respects. This will help in build up of utilities also.

3. The scope, terms of reference and obligatory process of environmental clearance and procedures should be standardized by Ministry of Environment & Forests to enable faster environmental clearances. This requires coordination in actions and policies of Central and State Governments and even within Central Ministries needs to be better coordinated.

4. Frequent changes in Model Concession Agreement, Request For Proposal (RFP) and Request For Quotation (RFQ) norms should be avoided as it makes project implementation difficult and results in bidders spending a lot of time, effort and money in performing due diligence. Issues regarding Termination payments during period of construction should be addressed.

5. Poor Quality of Detailed Project Report (DPR) - It is recommended that the DPRs prepared should be accurate and of good quality to enable better project planning and timely completion of project with minimum deviations. It is often felt that the attention that Government agencies like NHAI gives to DPRs has reduced over the years, as Government is more keen on projects in rural areas.

6. A good quality DPR will ensure that the Government agency can come out with a range of Bids, that a bidder can quote. This will extreme overbidding by some ambitious corporate. The Government should then restrict any post bid negotiation.

7. Public Partnership Projects are grounded in appropriate sharing and allocation of risks. Government should not therefore try to maximise returns by frequent revenue sharing models in projects that are sustainable even without revenue

sharing and at lower user charges. Also un-forecastable risks like future fuel prices should not be passed entirely to private sector.

8. In the light of the fact that confidence of the banking system and corporate needs to be brought back in this sector, the Government can think of a Political risk insurance cover on the lines that ECGC or MIGA offers to Indian corporate investing abroad. The Government may also consider setting set up a corpus, which would provide support to a pool of projects. Such a corpus could be funded through budgetary allocation, contributions from multilateral agencies etc.

9. The corpus could be used to create First Loss Default Guarantee Funds provide partial guarantees to lenders for certain projects which may need such support.

Chapter Eight

A note on Debt Restructuring mechanism (CDR cell)

The asset quality of SCBs, which was deteriorating continuously, recorded an improvement in March 2013 quarter. The Gross Non-Performing Advances (GNPA) ratio of SCBs improved to 3.4 per cent as at end March 2013 against 3.6 per cent as at end September 2012. The net NPA ratio declined to 1.4 per cent as at end March 2013 from 1.6 per cent as at end September 2012. This decline in NPA was attributed to the lower slippage, improved recovery and higher write-off during the quarter. Change in classification for restructured advances with effect from April 1, 2015 may have some adverse impact on the NPAs, unless banks take preventive measures in this regard.

At the bank-group level, the GNPAs of public sector banks was highest and stood at 3.8 per cent as at end March 2013, followed by that of the foreign banks. The quarterly slippage ratio of public sector banks declined to 0.5 per cent for the quarter ended March 2013 from 0.8 per cent recorded during September 2012. Quarterly slippage of foreign banks increased to 0.3 per cent and 0.1 per cent for the corresponding periods. The old private banks registered highest quarterly recovery at 21.2 per cent during quarter ended March 2013 followed by the public sector banks at 9.1 per cent. All the bank groups, except new private banks, recorded higher write-off during the quarter ended March 2013 as compared to quarter ended September 2012

The restructured standard loans of SCBs as proportion of their total loans have registered a marginal decline from 5.9 per cent as at end September 2012 to 5.7 per cent as at end March 2013. Among the bank groups, this ratio, at 7.1 per cent, was the highest for the public sector banks followed by old private banks.

Industry and services sector account for a major proportion of restructured loans of the banking sector. As these sectors have a relatively higher share of total bank credit, the trends in restructuring of loans to these sectors make a bigger impact on the health of the banking sector. Within the industrial sector, a few sub-sectors, namely; Iron & Steel, Textile, Infrastructure, Power generation and Telecommunications; have become a cause of concern

in recent times. In case of sectors like Aviation, though the incidence of restructuring is high, its share of bank credit is relatively low.

Chart 2.21: Stressed Loans : Sector-wise – March 2013
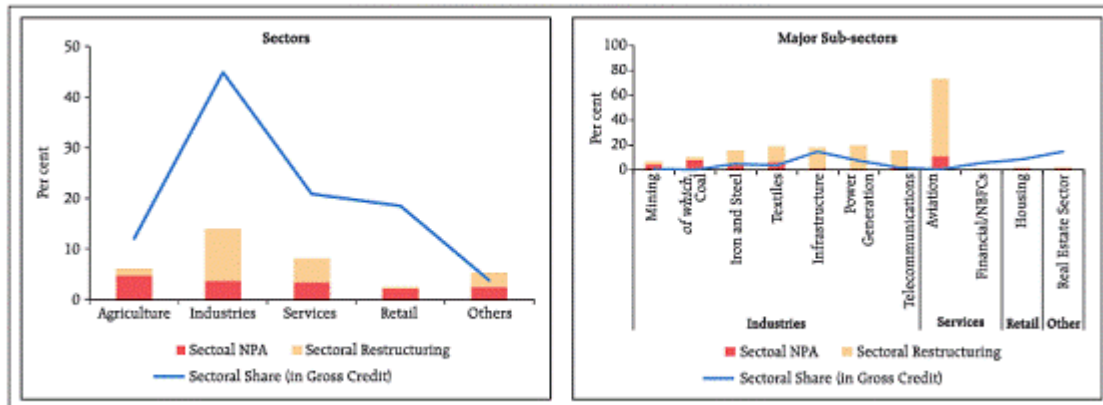
Source: RBI Supervisory Returns

The recommendations of a Reserve Bank Working Group to review the restructured loans have been accepted and the extant asset classification benefits available on restructuring will be withdrawn effective from April 1, 2015 - with the exception of provisions related to changes in date of commencement of commercial operation (DCCO) in respect of infrastructure and non-infrastructure project loans.

The Working Group had also recommended that, till such time the regulatory forbearance on asset classification is dispensed with, the provision requirement on such accounts should be increased from the present 2 per cent to 5 per cent, in order to prudently recognise the inherent risks in restructured standard assets in the interregnum. The Reserve Bank, therefore has increased the provision on restructured standard accounts to 2.75 per cent from 2.00 per cent. The provision has been increased to 5 per cent in respect of new restructured standard accounts (flow) with effect from June 1, 2013 and in a phased manner for the stock of restructured standard accounts as on March 31, 2013.

Genesis of CDR Mechanism in India

There are occasions when corporates find themselves in financial difficulties because of factors beyond their control and also due to certain internal reasons. For the revival of such corporates as well as for the safety of the money lent by the banks and financial institutions, timely support through restructuring of

genuine cases is called for. However, delay in agreement amongst different lending institutions often comes in the way of such endeavors. Based on the experience in countries like the UK, Thailand, Korea, Malaysia, etc. of putting in place an institutional mechanism for restructuring of corporate debt and need for a similar mechanism in India, a Corporate Debt Restructuring System was evolved and detailed guidelines were issued by Reserve bank of India on August 23, 2001 for implementation by financial institutions and banks.

The Corporate Debt Restructuring (CDR) Mechanism is a voluntary non-statutory system based on Debtor-Creditor Agreement (DCA) and Inter-Creditor Agreement (ICA) and the principle of approvals by super-majority of 75% creditors (by value) which makes it binding on the remaining 25% to fall in line with the majority decision. The CDR Mechanism covers only multiple banking accounts, syndication/consortium accounts, where all banks and institutions together have an outstanding aggregate exposure of Rs.100 million and above. It covers all categories of assets in the books of member-creditors classified in terms of RBI's prudential asset classification standards. Even cases filed in Debt Recovery Tribunals/Bureau of Industrial and Financial Reconstruction/and other suit-filed cases are eligible for restructuring under CDR. The cases of restructuring of standard and sub-standard class of assets are covered in Category-I, while cases of doubtful assets are covered under Category-II.

Reference to CDR Mechanism may be triggered by:

- Any or more of the creditors having minimum 20% share in either working capital or term finance, or
- By the concerned corporate, if supported by a bank/FI having minimum 20% share as above.

It may be emphasized here that, in no case, the requests of any corporate indulging in fraud or misfeasance, even in a single bank, can be considered for restructuring under CDR System. However, Core Group, after reviewing the

reasons for classification of the borrower as wilful defaulter, may consider admission of exceptional cases for restructuring after satisfying itself that the borrower would be in a position to rectify the wilful default provided he is granted an opportunity under CDR mechanism.

Structure of CDR System: The edifice of the CDR Mechanism in India stands on the strength of a three-tier structure:

- CDR Standing Forum
- CDR Empowered Group
- CDR Cell

Issues and Concerns regarding CDR Mechanism

Debt restructuring is a tool to offer aid to borrowers in distress, owing to circumstances beyond the borrower's control such as a general downturn in the economy or a sector. It might also be warranted by legal or other issues that cause delays, particularly in cases of project implementation.

As of June, lenders had approved CDR packages for 415 companies, with aggregate debt of Rs 2,50,279 crore. The iron and steel sector accounted for the most — Rs 53,543 crore. A year earlier, 309 cases, with aggregate debt of Rs 1,68,472 crore, were on the CDR platform.

There has been concern on the growing number of companies opting for a debt recast. The Reserve Bank of India had implemented strict norms to ensure only genuine units took this route. However, the performances and operations of companies in the CDR cell are often overlooked. Many of these have been under CDR protection for years, without any incentive to move out. It brings to the fore an issue of lack of a detailed performance check at CDR as some corporate had remained in this platform for long and continued to enjoy "protection", without making any move to step out. The Government is set to carry out a performance review of companies that have opted for corporate debt restructuring . This follows various steps taken to curtail the virtually unchecked flow of CDR cases.

The following issues need immediate attention in the CDR cell

- There is a need to do deeper strategic due diligence of problem accounts to locate tough management actions needed for turn around. In this bankers should only bear downside risks and upside risks have to borne by more equity from sponsors.

- At the financial analysis level conversion of debt into equity may not be such a good idea on account of rising cost of equity as mentioned earlier and two, banks really are not into business of running companies

- After the debt has been recast, a proper monitoring mechanism is needed to ensure management follows through on tough decisions in operational turn around.

- The cell must send out a message that CDR cell is not available till perpetuity. An effort can be made to restructure certain projects without CDR support.

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