Chapter 2

INFRASTRUCTURE PROJECT FINANCE

CONCEPTS AND REVIEW OF LITERATURE

2.1. Introduction

It is evident from the previous chapter that for India to continue her growth on a sustainable path, investment in infrastructure is critical. Gross capital formation through infrastructure is targeted at 9% of GDP to sustain growth rate of 8 to 9 per cent. The Economic Advisory council to the Prime Minister, Dr. Manmohan Singh, has also estimated that $350 billion would be needed by 2012. Compared to China, which spent $150 billion in 2003 (10.6% of GDP), India expended $21 billion (3.5% of GDP) in the same period which is one seventh of China’s expenditure (Ahya and Sheth, 2005). It is expected that the investment in infrastructure in the next 10 years would be $75 billion for power and electricity, $55 billion for airports and railways and $25 billion for telecommunications over the next 5 years (Kochar and Kearney, 2006).

This chapter is divided into three sections after explaining some basic concepts and definitions. In Section A, literature review is carried out for the project finance structure and the way it is being used for projects across the world. This section differentiates between the traditional corporate finance structure and the modern project finance structure as understood by banks to finance infrastructure projects. It also highlights the advantages and disadvantages of using this structure. In Section B, the application of this structure to finance infrastructure projects is discussed. In Section C Project appraisal and risk measurement as practiced by Indian banks is discussed. The RBI guidelines as also Basle II norms are also discussed in this section.

2.1.1. Commercialization of Infrastructure: For the above growth rates to be sustained, the researcher has noted that the Infrastructure sector needs to be unbundled and commercialized. (Raghuraman et al, 1998) A wave of privatization and deregulation has been sweeping infrastructure sectors across the globe over the last decade or so. Whereas the specific motivations and circumstances vary for each country and within the country by sectors, there are five basic pragmatic and non-ideological related factors that are leading economies all
over the world, and these aspects may be considered for enhancing commercialization of infrastructure provision (Chandavarkar Anand, 1994). These are, as the researcher has already noted in Chapter 1: (i) the amount of investment required, (ii) the importance of efficiency in investment and delivery, (iii) the changes in technology, (iv) the increasing need for countries to compete in the global market place, and (v) the new dynamism and integration of world capital markets. These factors have vastly increased the possibility of raising large funds for infrastructure investments on a commercial basis, whereas earlier it was the government which had better access to resources. Presently it is the private sector, in many cases, that is in a better position to garner large funds internationally.

However, the commercialization of infrastructure and unbundling lead to a considerable increase in transaction costs which have to be reduced through transparent and appropriate regulation (Kassum, Jemal-ud-din, 1994). According to the Deepak Parikh Committee Report, 2007, the major constraints in achieving commercialization of Infrastructure are:

2.1.2. Constraints to Infrastructure Development

(a) Privatization and commercialization: It is important to recognize the rationale of private sector participation. The usual arguments are: additionally of resources, improved managerial efficiency in asset creation, utilization and efficient customer service, all leading to better financial health (India Infrastructure Report, 1996).

(b) Unbundling of infrastructure: A necessary condition before attracting private participation is unbundling of infrastructure into logical sub-activities which can be privatized separately to enable private parties not to have to bite more than what they can chew. A recent example of unbundling of the British Railway can be a model (Prem Pangotra and G Raghuraman, 1995).

(c) Project structuring: This is a key issue since projects have to be structured small enough to make them investor-friendly, and, at the same time, commercially viable. (Raghuraman et al, 1999).

(d) Project appraisal and financing: The issue here is appraising the projects against future cash flows rather than on asset base or collaterals. Further, control over revenue, risk appraisal and mitigation, project documents and contracts would be related concerns (K.Balu, 2002; Indian Banking System Outlook, 2006).
The present research will look into these concerns from the point of view of Indian Commercial Banks. The Indian banking is defined below for the purpose of research.

### 2.2 Definition of Indian Banking

As per Section 5(b) of the Banking Regulation Act, 1949, banking means "the accepting, for the purpose of lending or investment, of deposits of money from the public, repayable on demand or otherwise, and withdrawable by cheque, draft, pay order or otherwise".

For the purpose of research, the Indian Banks and Financial Institutions (FI's) have been treated on par. While Indian banks mean all Scheduled Commercial Banks (including foreign banks, but excluding Regional Rural Banks), the term Financial Institutions in the context of infrastructure refers to major Development Financial Institutions (DFIs), viz. Industrial Development Bank of India (IDBI), Industrial Finance Corporation of India (IFCI), Industrial Development Finance Corporation and (IDFC), India Infrastructure Finance Company Limited (IIFCL).

Public Sector Banks are defined as those banks where the majority holding stake is with the Government of India. Multinational banks are those banks which have majority holding stake by banks that have been established abroad.

As per Section 5(d) of Banking Regulation Act, 1949, Company means any company as defined in Section 3 of the Companies Act, 1956, and includes a foreign company within the meaning of Section 591 of that Act. Non-Banking Financial Company (NBFC) is a company registered under the Companies Act, 1956, and is engaged in the business of loans and advances, acquisition of shares/stocks/bonds/debentures/securities issued by the government or a local authority or other securities of a marketable nature, like leasing, hire-purchase, insurance business, and chit business. But this does not include any institution whose principal business consists of agriculture activity, industrial activity, sale/purchase/ construction of immovable property. A non-banking institution which is a company and which has its principal business of receiving deposits under any scheme or arrangement or any other manner, or lending in any manner is also a non-banking financial company (Residuary Non-banking Company).

In the changed scenario of deregulation of interest rates, disintermediation, increased autonomy in credit decisions by banks and financial institutions and their inter-penetration into term loan/ project finance (syndication) has significantly changed the operating
environment. Thus, the financial institutions are now clamoring for the commercial bank status. RBI, in 2005, also approved the merger of IDBI Ltd. with IDBI Bank. Based on the Khan Working Group and the Discussion Paper on the issue in 2000 (vide Circular, September 2000), the RBI Governor had said that the request of financial institutions to convert into banks will be taken on case by case basis. Though the balance sheets of the two may be different, however, for expositional purposes, the terms “Indian Banks and Financial Institutions” have been commonly referred together in this research.

It is time for banks to address the change in paradigm shift from a vanilla type corporate finance structure to a contract and market finance approach which can be called as Project Finance. The international practice is to use Project Finance structures to Finance Infrastructure. The same is being followed in India.

Section A

Structure of Project Finance

2.3. From Corporate to Project Finance

The growth of any firm is directly related to the resource allocation of the firm (Chandra, 2002). The firm allocates its resources in anticipation of the future benefits and to achieve the desired growth. The most important aspect to be achieved in the direction and position in which the firm will stand in the coming future depends on the implementation of the strategies formulated at present with a view to the future. The most important factor in shaping the management policies and corporate valuations is the strategy involved in their implementation (Kaplan and Norton, 2001). In order to achieve the objective of maximizing firms’ value, the resource allocation should result in “good” investments rather than “bad” ones. Over the years, firms have been using different methods of raising funds for financing their investment needs. Historically, it has been debated whether the irrelevance proposition of Modigliani and Miller (1958) holds true in the real world. The firms are still questioning the underlying assumptions of the irrelevance proposition. They have realized that the financing and investing decisions are not separable, but are co-related. The biggest and most visible investments are the large-scale investments or capital expenditure made by the companies. These investments have a huge impact on all the players involved, and, at times, these are also termed as bet-the-company type of investments (Esty, 2003). The firms have historically used project finance for industries and infrastructural projects like toll roads,
power plants, mines, pipelines, oil fields, telecommunications, etc. The application of project finance in the corporate expenditures is not new but has not been used as it should have been. The main objective of these capital expenditures is to invest the current resources in view of the anticipated future benefits. The capital expenditure investments involve a current outlay or a series of outlays of cash resources in return for anticipated flow of future benefits, and, in turn, these investments influence the firm’s growth and affect the risk profile of the firm (Quirin, 1977).

These expenditures are considered as an act of “commitment” that can establish (or destroy) a trajectory of sustainable competitive advantage (Ghemawat, 1991). These are also classified as bet-the-company type of investments, e.g. when Airbus decides to develop A380 aircraft at an anticipated cost of $13 billion, the company had booked sales of only $17 billion and a failure could have resulted in bankruptcy (Esty & Kane, 2000). The ‘bet the company’ proposition is because of the irreversible nature of the capital investments, and if reversed it would have been at a huge cost. For example, Enron’s bankruptcy resulted in the acquisition of more than $200 million Enron’s stake in Dabhol Power Company by GE and Bechtel for only $2 million (Mehta, 2001). The large capital expenditures incurred not only have an effect on the reputation of decision makers in the companies or affect the companies executing these projects but also on the communities and nations where they are situated or established.

2.3.1 Strategic Route to Growth: The Capital Expenditure: A corporation’s growth and even its survival depend upon a continuous allocation of resources in new capital investments. Corporate prosperity largely depends on the ability to identify and generate profitable capital projects (Adelson, 1970). The capital expenditure investments involve a current outlay or series of outlays of cash resources in anticipation of flow of future benefits, and, in turn, these investments influence the firm’s growth and affect its risk profile (Quirin, 1977).

The definition of capital expenditure, therefore, is not what is normally defined by accounting norms. According to accounting practice, this is an expenditure which is shown as an asset in the balance sheet and is to be depreciated over the life of the project. This narrow view of capital expenditure fails to identify the outlays on research and development, reconditioning of plant and machinery, etc., even though these are targeted to encash future opportunities and have long-term impact on the firms. These decisions, because of their long-
term impact, are classified as “strategic” investment decisions as against “tactical” decisions (which involve only a relatively small amount of funds). So, these capital expenditures may result in a major departure from what the company has been doing in the past. Acceptance of a strategic investment will involve a significant change in the company’s expected profits and in the risks to which these profits will be subjected. These changes are likely to lead shareholders and creditors to revise their evaluation of the company. The same has been illustrated by McConnell and Muscarella (1985) in a study indicating that an increase in capital expenditure intentions, relative to prior expectations, results in increased stock returns around the time of announcement, and vice versa for an unexpected decrease.

These expenditure decisions determine the future destiny of the firm. The capital expenditure, because of the amount involved, can become a defining amount for most companies. The large capital expenditures not only have an effect on the decision makers in the companies or companies executing these projects but also on the communities and nations where they are established and operated. They can improve the social and economical conditions of the region by providing an unexpected upswing to the development rate, not anticipated earlier, or can even cause disasters for the nations. For instance, Enron’s Dabhol power plant’s failure created an unmanageable power crisis in Maharashtra State and a negative impact on the creditworthiness of India. Additionally, it is reflected on the political risk management system due to the instability of the government decision making process (Raghav & McCaffery, 2004). On the other hand, the success of the $1.4 billion Mozal Project in Mozambique provided the much needed economic boost to the development in one of the poorest countries of the world. To elaborate, Mozal’s share of GDP was 3.2 per cent in 2003 and contributed 5 per cent to the country’s economic growth and 15 per cent to Mozambique’s export earnings which increased from US $220m to around US $1bn. Mozal also doubled Mozambique’s exports, providing in excess of US $811 million in foreign exchange earnings. The net positive impact on external trade was $400 million at a steady state; the direct impact on manufacturing industry’s gross output was 49 per cent; the net positive impact on balance of payments stood around $100m at steady state; direct job opportunities were created for 1,150 employees, 1,600 contractors; the indirect employment creation was estimated at 10,000 jobs (Mozal Overview, 2003). It is relevant to note here that the Mozal project was envisioned at a time when Mozambique was struggling for development after 17 years of civil war and had a GDP of $1.7 billion (Esty and Qureshi, 1999).
The capital expenditure decisions have an impact on the long gestation period of the project and inevitably affect the company's future financing health structure. These expenditures are also irreversible, and if reversed, the firm would incur a huge financial loss. As the companies do not have unlimited capital resources, in case a venture fails to take off, the loss will not be limited to the project itself but also the opportunities lost will have to be taken into account, because other profitable ventures would have been shelved.

2.4. Traditional On-Balance Sheet Financing Structure

Traditionally, companies have been using various methods for funding their capital expenditure requirements like: Corporate Bonds, Term Loans, Asset-based Security Funding, Equipment Leasing, Venture Capital and, most common of all, Initial Public Offerings (IPOs) or subsequent Offerings of equity capital. These are conventional ways in which firms raise new equity capital or funds from the lenders. The lenders provide funds to the parent company (the investing firm) and then the parent company invests the funds in the project assets. In this form of financing, commonly known as corporate financing or the balance sheet financing, although the financing is done for the project, the lender looks at the cash flows and assets of the whole company in order to service the debt and assure security of funds (Pandey, 2005).

In case of default, the lenders have full claim on the total assets of the parent company including the new project assets for which the new debt is being issued. In this way the lenders have full recourse on the parent company for the repayment of the debt. This kind of lending largely depends on the parent company and not on the project per se in which the amount will be invested. Therefore, the financial credibility and standing of the parent company plays a major role in deciding the amount disbursed and the conditions and characteristics of the loan. The parent company is exposed to risk for the full amount required for the investment. In other words, the existing shareholders are exposed to an additional risk by this act and the claim of the shareholders is further reduced due to the additional financial risk. This kind of arrangement can result in risk contamination and the parent company may be termed as a potential defaulter.

2.5. Structure of Project Finance

Project Financing is generally used to refer to a non-recourse or limited recourse financing structure in which debt, equity, and credit enhancement are combined for construction and
operation, or the refinancing of a particular facility in a capital-intensive industry, in which lenders base their credit appraisals on the projected revenues from the operation of the facility, rather than on the general assets or the credit of the sponsor(s) of the facility, and rely on the assets of the facility, including any revenue-producing contracts and other cash flows generated by the facility, as collateral for the debt (Hoffman, 2001). The concept of project finance is very simple, as it involves a capital investment on the merits of the asset's returns, but despite the simplicity of the concept, there is no common definition agreed upon by the financial community. According to Finnerty (1996), "...the raising of funds to finance an economically separable capital investment project in which the providers of the funds look primarily to the cash flow from the project as the source of funds to service their loans and provide the return on their equity invested in the project." According to Nevitt and Fabozzi (2000), "The financing of a particular economic unit in which a lender is satisfied to look initially to the cash flow and earnings of that economic unit as the source of funds from which a loan will be repaid and to the assets of the economic unit as collateral for the loan." According to Pacelle et al (2001), "It is a term that typically refers to money lent to build power plants or oil refineries." According to Esty and Sesia (2005), "It involves the creation of a legally independent project company financed with equity and non-recourse debt for the purpose of financing a single purpose capital asset, usually with a limited life." Lastly, as per Standard & Poor's Risk Solutions (2002), "A project company is a group of agreements and contracts between lenders, project sponsors, and other interested parties that creates a form of business organization that will issue a finite amount of debt on inception; will operate in a focused line of business; and, will ask that lenders look only to a specific asset to generate cash flow as the sole source of principal and interest payments and collateral."

All these definitions of project finance highlight some basic characteristics of the project financing method. These are:

- **Creation of Separate Entity** popularly known as *Special Purpose Entity or Special Purpose Vehicle* (SPE/SPV). The SPV has a defined objective and definite life;

- **Equity Holding Pattern** which may involve 3 or 4 equity sponsors;

- **Non-recourse Debt** implies that the debt component provided by lenders is on non-recourse nature and the lenders have no claim on the equity sponsors for the repayment of debt service but fully rely on the project cash flows for the debt service;
• High Leverage and complex Contractual Structure.

Project finance is growing in terms of importance, but in the absence of clear-cut demarcations between project finance and other financing structures, like Secured debt, Subsidiary debt, Asset-based securities, Real estate investment trusts, Joint ventures, Vendor-financed debt, Lease, Leveraged or management buyouts, Commercial real estate development, Project holding companies, it creates further confusion as to what all can be precisely defined as project finance and what should not be. However from a banker’s point of view, the above discussion clearly gives the demarcation between on-balance sheet financing and project financing.

In the next section the researcher looks at how infrastructure projects are being financed through the project finance structure instead of the corporate finance structure.

Section B

Infrastructure and Project Finance

2.6. History of Financing Infrastructure

The use of project finance to fund infrastructure is not a new phenomenon as considered by many. It has been an age-old practice for funding the capital expenditure. One of the earliest recorded applications of project finance was in 1299, when the English Crown enlisted a leading Florentine merchant bank to aid in the development of the Devon silver mines. The bank received a one-year lease for the total output of the mines in exchange for paying all the operating costs without recourse to the Crown if the value or amount of the extracted ore was less than the expected output (Kensinger and Martin, 1988). In the current times, this type of arrangement is commonly known as production payment loan. The trading expeditions of the 17th and 18th Centuries were also financed by project financing methods. Investors provided funds to the Dutch East India Company and the British East India Company for the voyages to Asia, after which they were repaid according to their share of the cargo sold (Eiteman et al, 1998). In the 1930s, in the United States, the “wildcat” explorers in Texas and Oklahoma used production payment loans to finance oil-field exploration (Smith and Walter, 1990). The real estate developers were also building and developing commercial properties by using project structures. In the 1970s, project finance began to develop into its modern form, partly in response to several large natural resource discoveries and partly in response to the soaring energy prices and the resulting demand for alternative energy sources. British Petroleum
raised $945 million on project-basis in the early 1970s to develop the “Forties Field” in the North Sea. Around the same time, Freeport Minerals project-financed the Ertsberg copper mine in Indonesia and Conzinc Riotinto of Australia project-financed the Bougainville copper mine in Papua New Guinea (Esty, 2005). The reasons for selecting project finance were the amount of investment required and the firm’s balance sheet. The balance sheet of the firms provided a restriction to raise the amount required.

Project Financing is a well-established financing technique. Chen et al (1989) documented more than $23 billion worth of project financing between 1987 and 1989 and identified 168 projects financed on this format, including 102 projects for power production. Project financing can be used to finance the infrastructure requirement of the countries (Financing the Future, 1993; Forrester et al, 1994; Chrisney, 1995). Project financing has long been used to fund large-scale natural resource projects. The use of project finance is primarily focused on the development of infrastructural requirements like roads, electricity generation, telecommunication, water, airports, and so on.

The use of project finance is not a new concept in India though it is still in its infancy and goes back to the 19th Century. For the development of the railways in the 1880’s the British principally had recourse to finance from private entities whose investments took the form of project finance (Benouaich, 2000). In recent years, the Government of India has realized that to develop the infrastructure in the country, they have to look towards the private sector via the PPP method. Presently, the use of project finance has increased in India and it is not only used for infrastructural financing as for Dabhol Power Company (now the Ratnagiri Gas and Power Private Limited), and Noida Toll Bridge Company, but it is also being used by many corporates for financing their requirements such as: Reliance Petroinvestments for the SPV formed by Reliance Capital; Reliance Industries to bid for IPCL; Global Steel Holdings (GSHL), an SPV controlled by Pramod; and Vinod Mittal of Ispat group for acquiring the Turkish Electric Arc Furnace (EAF).

2.6.1 Financing Infrastructure through Project Financing: In the early 1990s, privatization, deregulation, and globalization spurred the use of project finance in both developed and developing countries (Esty, 2005). During the recent years, project finance, which was primarily used for mining and natural resource projects, has been used for variety new projects also. In developing countries, because of the limited availability of public funds, the governments have decided to privatize the state-owned companies or infrastructure
development. According to a World Bank (2004) study on Public Policy for Private Sector and Private Infrastructure, from 1990 to 2003, investment in infrastructure projects with private participation in developing countries was to the tune of $890 billion. According to IFC publications on IFC-supported projects (1999), many developing countries have benefited from the application of project finance. In Argentina, in 1993, the project finance technique helped to raise $329 million to finance the 30-year concession period for the rehabilitation and expansion of the Buenos Aires' water and sewerage services project which was projected to provide better quality of water for approximately 6 million people; in Hungary, in 1994, the technique was used to finance 15-year concession worth $185 million joint venture project to develop, install and operate a nationwide digital cellular network; in China, in 1997, this technique was used to finance a $57 million greenfield project to install modern fiberboard plants in the interior of China to support her fast-growing construction industry.

The void created, due to the exit by the governments, in the infrastructure development was filled in by the private sector. The concurrent deregulation and globalization also forced the companies to look for new ways to raise funds for their capital investments and also new ways to conduct their businesses. The scarcity of natural resources also has forced the companies to look for untapped areas for development to overcome this constraint. In this scenario, the project finance industry has witnessed smooth sailing as well as seen rough weather since the beginning of the new millennium.

Growth reached all time high in 2001, but declined in 2002 as a result of global recession. Projects exposed to market, credit and political risks were hit badly and many of them defaulted. The glaring example was the now defunct $3 billion Dabhol Power Plant, which defaulted on the payment in 2001. The impact of the 'three risks' mentioned above has left many investors with non-performing assets in their laps and has encouraged many participants – sponsors, bankers, and investors – to exit the industry. But even after such drawbacks, the industry looks very promising. From only a project-financed investment of less than $10 billion per year in late 1980s, by 2008, the global project finance market has become the largest sector in history with an investment of approximately $234 billion. The amount invested represented a 36 per cent increase over 2003 and a 73 per cent increase over 2002, when the investments fell almost 40 per cent due to the economic slowdown. From 1994 to 2008, the total project-financed investment grew every year except in 1998 (following the Asian financial crisis) and 2002 (following the global recession). Despite these
declines, the 5- and 10-year Compound Annual Growth Rates (CAGRs) for the total project-financed investment were 8 and 19 per cent respectively.

The application of project finance has seen a shift also geographically. In 2000, the major lending was done in North America and Western Europe with 53 per cent of the total, but declined to 36 per cent by 2008. On the other side, Asia, the Middle East and Australia/New Zealand contributing only 17 per cent in 2000 rose to 46 per cent in 2008. The 4-year CAGR was the highest for Asia and Eastern Europe with 34 per cent, closely followed by the Middle East with 31 per cent. The increase in Asia was considered as very positive as the region was still recovering from the Asian financial crisis of 1998.

With respect to industrial-sector usage, project finance has largely been concentrated in the power, telecom, and infrastructure projects with approximately 71 per cent of the total investment in 2004 being allotted to these sectors. The infrastructure sector has seen a positive growth rate over the period from 12 per cent in 2000 to 17 per cent in 2004, with a CAGR of 15 per cent. However, the power and telecom sectors saw a decline during the same period with a CAGR of -6 per cent and -32 per cent respectively. The decrease could be the outcome of the high default rate in the power projects, while the expected boom which never materialized left the telecom sector companies with overcapacity which forced more than 50 companies to go bankrupt. On the other hand, there has been an unprecedented increase in the usage in oil and gas, industrial and mining sectors with a CAGR ranging between 25-54 per cent. This increase can be attributed to the change in government policies worldwide and the distress in power and telecom sectors, but still in terms of the amount, these sectors are relatively small but growing. Project finance is largely used across the globe in the power sector with 37 per cent during the 2000-06 period, with the Americas accounting for 54 per cent of the total. In the telecom sector, the Americas and Asia Pacific region have only 30 per cent share and Europe, the Middle East and Africa accounted for 7 per cent.

2.7. Infrastructure Finance through Project Finance in Asia and India

The project finance loans in the Asia Pacific region increased to $36.3 billion in 2006 from $16.3 billion in 2003, and as at June 30, 2005, it stood at $6.7 billion. The Indian share in the total project finance loans in the region was only 3.3 per cent with $1.2 billion in 2006 rising from 0.7 per cent in 2003 to $122 million, but showed a remarkable increase in 2005 with 16.1 per cent share and took the second position in the region. The leading players in the region till 2004 are: Australia with 28.9 per cent up from 22.2 per cent; South Korea with
17.5 per cent up from 16.8 per cent; Taiwan with 13.7 per cent up from 0.5 per cent; and Japan with 10.3 per cent up from 10 per cent. On the other hand, China showed a decline from 23.1 per cent to 7.7 per cent. In 2005, Laos moved to the third position with 15.3 per cent share from nowhere in 2003. With respect to industry analysis, transportation, power, oil and gas and petrochemicals had the majority loan share of 80.1 per cent at $29.1 billion. The same trend was observed in 2007 also, but the data for petrochemicals are not available. In terms of amount underwritten, Korean Development Bank was the lead arranger in 2004, while in terms of the number of issues, Mitsubishi Tokyo Finance was the leader and no Indian bank was among the top 10 lead arrangers. But in 2005, the scenario was different. ANZ was the lead arranger in the region, and State Bank of India (SBI) and Punjab National Bank (PNB) were among the top 10 lead arrangers at the second and the seventh positions. This improvement shows a positive trend in India with respect to usage of project finance to fund infrastructure.

2.8. Advantages of Project Finance

But the real questions are: Why should banks use project finance to fund the infrastructure requirements? How is project finance superior to traditional recourse-based corporate financing? As the long-term demand for capital and infrastructure is at a critical juncture and the present magnitude and growth clearly indicate that the future prospects of project finance are very strong and positive, the financial managers, bankers and government officials should understand the advantages of project finance and take advantage to create value additions by using the same positive trends. They should also realize that project finance-structured investment has a higher probability of providing the expected and targeted results in financial as well as operational scenarios. The motivations to use project finance are classified below as follows:

2.8.1. Risk Sharing Motivation: A capital expenditure passes through the following three stages – development, construction and operationalization. At each stage, because of uncertainties in the overall economic environment, the amount of risk is very high. The parties which can pose risk may vary from government (by full or creeping expropriation) to social activist groups (by forcing the project to forego some advantageous conditions because of societal issues), or customers (by not providing enough demand) to suppliers (by creating supply-related problems), etc. As the exposure involved in capital expenditure is very high and any risky venture might lead to financial distress, the companies following traditional
financing, whereby the parent company is exposed to the entire risk, may decide not to give a green signal to the project because of the increased incremental distress cost (because of adding the project to the portfolio of existing projects). The use of project financing can help the companies to invest in risky projects which the company may have to forego because of the increased incremental distress cost. This incremental distress cost either direct or collateral, if sufficiently large, can exceed the project's Net Present Value (NPV), which makes the positive NPV turn into a negative NPV investment.

According to Bruner et al (1995), project financing is a way of distributing risks and returns more efficiently than under conventional financial strategies. Those who have the specialized ability to bear the specific kinds of project risks are blessed with good returns. The application of separate entity helps in reducing the probability of risk contamination due to which an unsuccessful investment creates negative value for the otherwise financial healthy firm. This type of structural arrangement also helps in reducing ultimate distress cost in case of actual default. There are certain indirect impacts on the investments which can not be controlled, like the changes in unrelated commodities, but these would have an effect on the projects as these factors influence the overall economy of which the project is a part, just as the impact of the decision had on non-oil subsidiaries due to the shocking change in the oil prices (Lamont, 1997).

The risk management motivation has not been adequately dealt with in the existing financing literature. The risk management motivation is considered to be consistent with the emerging issues of the magnitude of investment distortions (Parrion et al, 2005). Over the years, the concepts of market imperfections incorporated in capital structure and risk management theories are ignored in capital budget analysis (Stulz, 1999). These concepts are addressed in the case of project finance as it differs from traditional finance management strategies because it involves a change in organizational form rather than the use of financial instruments or derivatives (Esty, 2003). The introduction of a risky project in the portfolio of a healthy firm can have a negative impact on the overall financial and trading position of the firm. The addition of the risky project can lead to volatility in the presently stable cash flows generated by the firm. If the volatility is significant enough, it can hinder the progress of the on-going investments (Froot et al, 1993; Lamont, 1997; Minton and Schrand, 1999). The increased risk of default due to this introduction can also encourage the existing suppliers and customers to review their business transactions (Titman, 1984).
Due to these kinds of negative impacts, the managers of any company, having an objective of value-maximizing, can rationally choose to forego the investment if corporate debt is the only option. But in project finance these risks are hedgeable with financial and other contracts. In project finance structures, specific contracts can be formulated in which the risk can be shared by other parties which specialize in the specific domain, e.g. a construction contractor can become a partner by sharing risk by putting equity interest; suppliers can become risk sharing partners by signing contracts for being the preferred suppliers. Even by signing some specific contracts, the risk can be mitigated, e.g. a turnkey contract can transfer the entire construction and setting up of the plant to the turnkey contractor; in the case of a power plant, by signing a PPA (Power Purchase Agreement); similarly an independent producer can be assured of the revenues. This contractual agreement also provides the project sponsors a high gearing ratio as otherwise possible due to reduced risk on the project and risk sharing among various parties. By risk sharing among many partners as other sponsors or debt lenders, the incremental distress costs are reduced because there is a positive and convex relationship between distress costs and leverage (Brealey and Myers, 2003).

2.8.2. Reduced Underinvestment Problems: Over the years of financial research, it has been noted that firms with high leverage (Myers, 1977), risk averse managers (Stulz, 1984; Smith and Stulz, 1985), and asymmetric information (Myers and Majluf, 1984) have a greater tendency of underinvestment.

According to the concept of underinvestment, a firm has a tendency of not investing in borderline capital expenditures because of the fear that a negative impact might result in financial distress which can lead even to bankruptcy. The underinvestment occurs only when capital providers have asymmetric information about assets-in-place and investment opportunities (Myers and Majluf, 1984). Project finance reduces asymmetric information by eliminating the need to value assets-in-place (Shah and Thakor, 1987) as project finance separates the current assets and potential investment opportunities. The highly leveraged firms have more trouble in financing attractive investment opportunities because of the existing high fixed financial burden. The use of corporate debt as per traditional financing can increase corporate leverage as it will increase the existing financial burden further, resulting in a failure to raise funds at all or at reasonable terms or cost, thereby forcing the investments to be non-profitable to the firms and this in turn can lead to firms being vulnerable to underinvestment. But project finance allows the firms to preserve scarce
corporate debt capacity and borrow more cheaply than it could otherwise be possible. The use of secured debt can also reduce the leverage-induced underinvestment by allocating returns to new capital providers (Stulz and Johnson, 1985). Project finance also provides the same result through separate incorporation and non-recourse debt (Berkovitch and Kim, 1990; John and John, 1991; Flannery et al, 1993). But the use of project finance is more effective than secured debt since the lenders of secured debt have a residual claim on the corporate balance sheet and reduces the corporate debt capacity, while project finance eliminates all recourse back to the sponsoring firms. John and John (1991) have developed a model, based on the works of Myers (1977), which indicates that outstanding debt gives rise to an underinvestment incentive, thereby forcing the managers to pass up the positive NPV projects into situations where the projects would operate to the benefit of the debtholders but to the detriment of shareholders. Under such a scenario, in order to overcome the problem of underinvestment, in the case of highly leveraged firms, the issue of new equity is the only viable option for financing investment opportunities due to non-availability of corporate debt capacity, but this equity may be issued at a discount to make it attractive due to the high financial risk and may be turned down by the existing shareholders to avoid the dilution of their claims, which again leads to underinvestment as the projects may become unviable, if only financed by equity.

2.8.3. Reduce Costly Agency Conflicts: The one phenomenon which has been assumed to have a great impact on the value-maximization proposition of the firms is the agency issues. The literature on corporate finance has been extensively devoting its time and resources in establishing the relationship between conflict of interest among claim holders and distortions in investment decisions. Studies such as Mello and Parsons (1992), Leland (1998), Parrino and Weisbach (1999), Moyen (2000), Titman and Tsypaklov (2001) use the approach of calibrating a model on the database of public firms to estimate the magnitude of the impact of stockholder/debtholder conflicts on investment decisions. An agency relationship exists when one party (the principal) hires another party (the agency) to perform some services, and, in doing so, delegates decision-making authority to the agent. In any firm, the shareholders are principals and the CEO is the agent; if CEO is principal then managers are agents. Parrino et al (2005) argue that the compensation mode also has an impact on the distortions in investment decisions. According to the study, a manager who receives equity-based compensation is likely to favor projects that lower the firm’s risk even if they have a negative NPV and ignore the high-risk projects that have a positive NPV. This behavior occurs even though low risk (risky) projects transfer wealth to (from) debtholders from (to) stockholders.
Ideally, the incentive to increase the risk should complement, rather than substitute, for the incentive to increase the share value, thus, leading to value maximization, and if risk-taking incentives are high enough, relative to the incentives to increase the share price, then the manager’s option of holding may provide inducements to invest in risk-increasing, negative NPV projects (Rogers, 2005). However, if the manager also holds stock, this incentive will be partially offset by the lack of risk-taking incentives provided by stock holdings (Guay, 1999).

Investments generating Free Cash Flow (FCF) can lead to inefficient investment and value destruction on a much larger scale (Jensen, 1986; Harford, 1999; Blanchard et al., 1994) because of sub-optimal effort and excessive perquisite consumption (Jenson and Meckling, 1976). The costly agency conflicts arise when managers controlling the investment decisions and cash flows have different “Divergent Objectives” as compared to capital providers or shareholders. As the traditional methods of discipline are not so effective in project companies, the issue of separation of ownership and control is of paramount importance in project settings. The mechanism used to discipline managers of start-up firms as an opportunity for a liquidating event, such as an IPO or an acquisition (Baker and Montgomery, 1994), and the threat of staged-financing with contingent ownership (Gompers, 1995; Kaplan and Stromberg, 2002) are less effective in the context of project companies. Liquidating events are not possible as most of the projects have a limited life due to which asset values decline over time to zero.

2.8.4. Structured Risk Mitigation: In the case of traditional financing, the managers use the concept of raising the project’s hurdle rate, based on past experience, by an arbitrary amount to obtain a new hurdle rate, commonly defined as creating the risk-adjusted rate of return (RARR). According to them, the increased returns compensate the firm for bearing a substantial risk. This approach can at times convert a potential sound investment into a negative NPV investment, resulting in the firm deciding against investing. The structural approach of project finance provides a better platform for overcoming such issues. The most important remaining risk associated with any investment, after risk sharing, is the sovereign or political risk – the risk resulting because of either direct expropriation in the form of asset seizure or creeping expropriation in the form of increased government payments resulting in decreased cash flows to capital providers. The structural approach, in contrast with the increasing hurdle rate, uses the concept of paradox of infrastructure investment (Wells and Gleason, 1995) and reduces the risk through careful structuring. The use of debt structuring and choosing carefully selected lenders can reduce the sovereign risk, e.g. by incorporating
IFC or any other Multi-Lateral Agencies (MLAs), which lend only to projects rather than corporations, if the lenders can persuade the governments not to opt for expropriation because future lending to the host nation may become a difficult task if any project financed with the funds made available by these MLAs is expropriated. Also, the presence of high leverage in project finance makes it more costly for the host government to expropriate and thereby reduces the overall risk.

2.8.5. Reduced Overall Cost of Financing: Because of the full recourse nature of a debt, one of the advantages of traditional financing is that the debt is available at a less expensive rate to those companies that have a proven track record and financial standing in the market. But this advantage is often offset in project finance by the high leverage, which on an average is 70 per cent. Moreover, as project finance is dependent on highly contractual arrangements, at times it is possible to increase the gearing ratio and obtain favorable terms on the debt agreement also; e.g. in the case of toll-road financing, if the toll arrangement is based on annuity, the lenders are willing to provide up to 90 per cent of the total cost as non-recourse debt, and, because of the secured and guaranteed nature of repayments, even the rate of interest can be lower than the normal project finance deals. These advantages are not available in traditional financing because the lenders are not providing the funds to the project per se but to the company and at times they do not even raise concerns related to the usage of funds.

Another advantage of using project finance method and high gearing ratio is the reduced sovereign risk. In case, the firm adopts traditional or conventional financing, it has a tendency of increasing the hurdle rate and accepts those investments which provide sufficient returns. According to Wells and Gleason (1995), this approach increases the project’s sovereign risk because the government may feel that the sponsors are earning exorbitant profits at the cost of society. The concept that high returns result in high risk is known as “paradox of infrastructure investment.” But a high leveraged investment in the project may result in the project being unviable, thereby forcing the government to rethink before deciding to expropriate the project. This can be best explained by the problems the Government of India is facing in the revival process of the Dabhol Power Company (DPC), which is assumed to be expropriated after the Maharashtra State Electricity Board (MSEB) decided not to honor the PPA signed between the MSEB and the DPC after a political shift in the state (Rangan et al, 2004).
2.9. Disadvantages of Project Finance

Project finance has many advantages but, as no coin has only one side, there are certain disadvantages associated with project finance also. These disadvantages force the companies not to go in for project finance but have recourse to traditional finance. The main disadvantages are:

2.9.1. Huge Third-Party Costs: The project finance structures are very complex which result in huge third-party up-front investments or dead-weight costs in various legal processes, which are required for designing and preparing the project ownership structure, loan documentation, and other contractual requirements. The financial advisors, selected to help structure the financing, normally charge advisory fees to the order of 50 to 100 basis points. These costs are incurred at the project development stage because of which these are not recoverable if the project fails to take off. Also, at times, the feasibility studies may be conducted only to satisfy the other related parties which can increase the development costs.

2.9.2. Time-Consuming Process: Structuring a project-finance deal, involving many parties, takes considerable time as compared to structuring a corporate-finance or a traditional-finance deal. Whereas in traditional finance, the deal is finalized only by the internal team involving only a handful of people, in case of project-finance, the process of structuring the deal is unduly delayed because of the involvement of independent players each one trying to safeguard his/her personal interest. This incremental delay not only affects the project’s viability measures like NPV, IRR, etc., but it may also result in missed opportunities.

2.9.3. Stringent Covenants: One of the biggest disadvantages of project finance is the application of stringent covenants imposed by a number of parties involved to safeguard their interests. The covenants which affect the parties to a great extent are (a) reduced flexibility in managerial decision making, and (b) disclosure requirements. The reduced flexibility is an outcome of the extensive set of operating and reporting requirements imposed on borrowers by the lenders. These provisions restrict the sponsor’s ability to modify the design, admit new partners, dispose of assets, or respond to a large number of contingencies that invariably arise over the project’s life. As a result the firms are forced to delay their response to the lender’s ever-changing demands and meeting environmental concerns.

The disclosure covenant requires the firms to disclose certain proprietary information about the deal to the lenders, which the sponsors may not feel comfortable with. The biggest
problem lies in the syndicate loan process, whereby credit is provided by a group of banks by forming a consortium, which requires that all information has to be made available to all the members through the lead or mandate bank. The sponsors may force the lenders to sign confidentiality agreements, since the potential for leakage will be high due to the number of parties sharing the information, as compared to traditional financing process.

To summarize, project finance is still in its evolving stage, and has seen an exponential growth since 1990s. The use and growth of project finance is considered as a triumph of optimism over experience (Worenklein, 2003). But the growth has met with roadblocks in specific sectors, geographical areas and has also been hindered by the recent failures of large projects like Iridium, Dabhol, Eurotunnel, etc. However, the future looks bright as the global economy has improved and the investors have realized the advantages of risk sharing and the mistakes of over-committing themselves. The ‘Modigliani and Miller irrelevance proposition’ has been debated upon ad nauseam, and, after extensive research, it has been proved that the proposition, in reality, is not valid and that financing and investment are not exclusively separable and independent activities. How the companies finance an asset affects its value, which in turn suggests whether the asset should be financed. The authors do not suggest that the companies should start using project financing as a sole solution to all financing needs. In fact, they should consider adopting the new financing structures so that the objective of shareholder’s wealth maximization can be achieved. Companies should also try using project finance, if not already using it previously, for specific mega projects which, because of the amount invested, can have a material impact on the company’s earnings, debt ratings, and at times even their own survival. Similarly, for projects in highly volatile areas where the parent company is exposed to high degree of political risks, like war, strikes, terrorism, sabotage, direct or “creeping” expropriation or currency inconvertibility, project finance would be feasible. Likewise, proposed projects which are exposed to high degree of legal risk in a country which does not have a sound legal system in place and as a result the company may not have the complete certainty of having recourse to a successful legal action undertaken, is case of a default, project finance would be ideal. Lastly, a parent company planning joint venture with unknown partners, having weaker credit capabilities but otherwise sound technical expertise, in order to maximize the advantages of project finance, may benefit from project finance, thereby minimizing risks of exposure involved in these projects.
As the world is heading towards an integrated global market and the failure of governments as well as the demand for private capital in infrastructure assets is increasing, project finance will continue to play an important role in both developed and developing markets.

In the light of the above advantages and disadvantages of financing infrastructure through project financing, in the next section, the researcher looks at the Project Appraisal and Risk Measurement issues from the bankers' point of view.

Section C

Project Appraisal and Risk Measurement

2.10. Infrastructure Finance by Commercial Banks: Project Appraisal

Infrastructure Projects are complex capital-intensive projects requiring long gestation periods. They involve also large financial outlay. Investments involve high upfront costs and long-term financing since the repayment period is also usually long (India Infrastructure Report, 1996). The contractual structure of many Indian projects can be similar to those in more developed economies, but the practical reality is that project companies, and by extension their lenders, may face additional challenges that are present in many emerging markets. But they are more acute in the context of Indian bankers (Chetan Modi, 2008). Historically, initiatives to implement infrastructure projects in India have generally been vested with the public sector. With infrastructure services being perceived as natural monopolies, it was argued that only the government should be entrusted with its provisions. There was also the view that the financial outlays involved were beyond the resources available to the private sector. Both these views have undergone a sea change. In the current fiscal situation, the government will be constrained to raise resources from the market for providing budgetary support to the departments engaged in infrastructure development (India Sovereign Analysis, 2007). As a result, commercialization of infrastructure has taken place particularly during the last 7 to 8 years. However, the key problem in commercialization of infrastructure projects is the appropriate allocation of risk and source of funds. (Balu, 2002). When infrastructure is provided by the public sector, all the potential risks are internalized with the government and hence the issue of risk allocation does not really arise. But with the changing scenario, successful design of an infrastructure project involves the appropriate demarcation and allocation of risks to different stakeholders in the project. A key issue in infrastructure
financing relates to what recourse the lenders have if investments fail to produce the expected returns. Project financing is usually on non-recourse basis with lenders being repaid only from the cash flow generated by the project. Currently, financial markets have acquired ample experience in non-recourse financing where the focus is not to tie down the balance sheet of the promoter as security. The assessment of cash-flow stream of the infrastructure project determines the eventual financing of the sector and the range of instruments required to realize it. In all cases, the viability of the project should be assessed at commercial rates of return.

The nature of infrastructure projects and their inherent complexities make them different from traditional industrial projects with which the financial institutions have so far been familiar with, thereby leading to difficulties in appraisal and risk assessment (Balu, 2002). Most of the projects involve new techniques such as Build Operate Transfer (BOT) or Build Own Operate (BOO) or Build Own Operate Transfer (BOOT), etc. Of the $786 billion invested globally in PPP infrastructure projects between 1990 and 2003, India attracted only $33 billion or 4 per cent (The Hindu, June 4, 2007). Infrastructure projects with private participation that were cancelled or distressed amounted to $79 billion between 1990 and 2007. It is observed that large projects were more prone to distress or cancellation. In India, cancelled or distressed private participation projects comprised 7 per cent of the $51.4 billion spent on infrastructure projects worldwide (World Bank Database, 2006). 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.

When initiating an infrastructure project, a project company is formed under the BOT and PPP approaches. The project company constructs and operates the project for 25 to 35 years before transferring it back to the government. Under the PPP model, the government buys the services from the project company. Even the State-Build-Own-Operate (SBOO) approach has led many countries – Mexico, UK, China, Nigeria and many more – down the path of privatization. There are many shortcomings in the BOT and PPP approaches which have created several problems for the lenders to appraise them correctly (Chen and Kubick, 2007). In India ‘riding’ corruption in project design and allocation escalates the costs of the project and the commencement of the operation date (Wilkinson, 2006). In road-construction many
companies self-finance their projects instead of them being funded by the Government (Vasdev, 2006). The bidding process itself is inefficient, thus hampering the lending banker’s appraisal of costs and assessment of funds. The lack of competitive bidding in the Enron Project set it on a weak foundation from the outset (Allison, 2001).

Thus, in addition to the traditional financial, technical or economic appraisal capabilities of project financing, infrastructure projects require also a deep understanding of the legal implications, regulatory framework and institutional financial arrangements under which the project promoters will have to operate. Infrastructure projects being on non-recourse or limited recourse basis, financing them poses a tough challenge. Often, through a comprehensive web of contracts, every major risk element of the project is allocated to the party that is best able to assess and manage them. Though the literature survey points out to many studies, it does not come out with a single definite answer to the model appraisal process that can be used by the banks for appraising infrastructure projects as well as for assessing risk factors, particularly with reference to India. The research carried out by Mr. K. Balu, Assistant General Manager, RBI, is particularly relevant as he has studied the various issues in infrastructure projects and has given suggestions particularly with reference to structuring and appraising with reference to Commercial Bank Financing.

2.11. Reserve Bank of India’s Norms for Financing Infrastructure

Infrastructure finance is defined as any credit facility, in whatever form, extended by the banks to an infrastructure project, as specified below, that falls within the definition of “infrastructure lending” (Master Circular, DBOD. No. FID. FIC.4/01.02.00/2007-08 dated July 2, 2007). In other words, it is a credit facility provided to a borrower company engaged in:

- Developing, or
- Operating and Maintaining, or
- Developing, Operating and Maintaining

any infrastructure facility that is a Project, such as:

(a) a road, including toll-road, a bridge or a rail system;

(b) a highway project including other activities being an integral part of the highway project;
(c) a port, airport, inland waterway or inland port;

(d) a water supply system, irrigation project, water treatment system, sanitation and sewerage system or solid waste management system;

(e) telecommunication services, whether basic or cellular, including radio paging, domestic satellite service (i.e. a satellite owned and operated by an Indian company for providing telecommunication service), network of trunking, broadband network;

(f) an industrial park or special economic zone;

(g) generation or generation and distribution of power;

(h) transmission or distribution of power by laying a network of new transmission or distribution lines;

(i) Any other infrastructure facility of similar nature.

2.11.1 Exposure Ceilings

2.11.1.1 Single/individual borrowers: The credit exposure to a single borrower should not exceed 15 per cent of capital funds of the banks. However, the exposure can exceed by additional a five percentage points (i.e. up to 20 per cent) provided the additional credit exposure is on account of infrastructure projects. Banks may, in exceptional circumstances, with the approval of their Boards, consider enhancement of the exposure to a borrower up to a further 5 per cent (i.e. total 25 per cent) of the capital funds for infrastructure projects and 20 percent for other projects.

2.11.1.2 Group borrowers: The credit exposure to the borrowers belonging to a group cannot exceed 40 per cent of the capital funds of the banks. However, the exposure may exceed by an additional 10 percentage points (i.e. up to 50 per cent) provided the additional credit exposure is on account of infrastructure projects. Banks may, in exceptional circumstances, with the approval of their Boards, consider enhancement of the exposure to a borrower up to a further 5 percentage points (i.e. 55 per cent) of capital funds for infrastructure projects and 45 per cent for other projects.

Banks/FIs are free to finance technically feasible, financially viable and bankable projects undertaken by both the public and the private sector undertakings subject to the following conditions:

(a) The amount sanctioned should be within the overall ceiling of the prudential exposure norms prescribed by the RBI for infrastructure financing.

(b) Banks/FIs should have the requisite expertise for appraising technical feasibility, financial viability and bankability of projects, with particular reference to risk and sensitivity analyses.

(c) In respect of projects undertaken by the public sector units, term loans may be sanctioned only for corporate entities (i.e. public sector undertakings registered under Companies Act or Corporations established under the relevant statute). Further, such term loans should not be in lieu of or to substitute budgetary resources envisaged for the project. The term loan could supplement the budgetary resources if such supplementing was contemplated in the project design. While such public sector units may include Special Purpose Vehicles (SPVs) registered under the Companies Act, and set up for financing infrastructure projects, it should be ensured by banks and financial institutions that these loans/investments are not used for financing the budget of the concerned state governments. Whether such financing is done by way of extending loans or investing in bonds, banks and financial institutions should undertake due diligence on the viability and bankability of such projects to ensure that revenue stream from the project is sufficient to take care of the debt servicing obligations and that the repayment/servicing of debt is not out of budgetary resources. Further, in the case of financing SPVs, banks and financial institutions should ensure that the funding proposals are for specific monitorable projects.

(d) Banks may also lend to SPVs in the private sector, registered under Companies Act for directly undertaking infrastructure projects which are financially viable and not for acting as mere financial intermediaries. Banks may ensure that the bankruptcy or financial difficulties of the parent/sponsor should not affect the financial health of the SPV.

(e) In respect of financing of infrastructure projects undertaken by government-owned entities, banks/financial institutions should undertake due diligence on the viability of the projects. Banks should ensure that the individual components of financing and returns on the project are well defined and assessed. State government guarantees may
not be taken as a substitute for satisfactory credit appraisal and also such appraisal requirements should not be diluted on the basis of any reported arrangement with the Reserve Bank of India or any bank for registering regular standing instructions/periodic payment instructions for servicing the loans/bonds.

Infrastructure projects are often financed through Special Purpose Vehicles. Financing of these projects would, therefore, call for special appraisal skills on the part of lending agencies. Identification of various project risks, evaluation of risk mitigation through appraisal of project contracts and evaluation of creditworthiness of the contracting entities and their ability to fulfill contractual obligations will be an integral part of the appraisal exercise. In this connection, banks may consider constituting appropriate screening committees/special cells for appraisal of credit proposals and monitoring the progress/performance of the projects. Often, the size of the funding requirement would necessitate joint financing by banks or financing by more than one bank under a consortium or syndication arrangement. In such cases, the participating banks may, for the purpose of their own assessment, refer to the appraisal report prepared by the lead bank or have the project appraised jointly.

2.11.3 Types of Financing by Banks: In order to meet the financial requirements of infrastructure projects, banks may extend credit facility by way of working capital finance, term loan, project loan, subscription to bonds and debentures/preference shares/equity shares acquired as a part of the project finance package which is treated as "deemed advance" and any other form of funded or non-funded facility.

2.11.3.1 Take-out financing: Banks may enter into take-out financing arrangement with IDFC/other financial institutions or even avail of their liquidity support. Banks may also be guided by the instructions regarding the take-out finance contained in Circular No. DBOD, BP. BC. 144/21.04.048/ 2000 dated February 29, 2000.

2.11.3.2 Inter-institutional guarantees: In terms of the extant RBI instructions, banks are precluded from issuing guarantees favouring other banks/lending institutions for the loans extended by the latter, as the primary lender is expected to assume the credit risk and not pass on the same by securing itself with a guarantee, i.e. separation of credit risk and funding is not allowed. These instructions are presently not applicable to banks. While the Reserve Bank of India is not in favour of a general relaxation in this regard, keeping in view the special features of lending to infrastructure projects, viz. the high degree of appraisal skills
required on the part of lenders and availability of resources of a maturity matching with the project period, banks are permitted to issue guarantees favoring other lending institutions in respect of infrastructure projects, provided the bank issuing the guarantee takes a funded share in the project at least to the extent of 5 per cent of the project cost and undertakes normal credit appraisal, monitoring and follow up of the project.

2.11.3.3. Financing promoter's equity: In terms of DBOD Circular, Dir. BC. 90/ 3.07.05/ 98, dated August 28, 1998, banks were advised that the promoter's contribution towards the equity capital of a company should come from their own resources and the bank should not normally grant advances to take up shares of other companies. In view of the importance attached to infrastructure sector, it has been decided that, under certain circumstances, an exception may be made to this policy for financing the acquisition of promoter's shares in an existing company which is engaged in implementing or operating an infrastructure project in India. The conditions, subject to which an exception may be made, are as follows:

(a) Bank finance would be only for acquisition of shares of existing companies providing infrastructure facilities as defined in Paragraph 1 above. Further, acquisition of such shares should be in respect of companies where the existing foreign promoters (and/or domestic joint promoters) voluntarily propose to disinvest their majority shares in compliance with SEBI guidelines, where applicable.

(b) Companies to which loans are extended should, inter alia, have a satisfactory net worth.

(c) Company financed and the promoters/directors of such companies should not be defaulters to banks.

(d) In order to ensure that the borrower has a substantial stake in the infrastructure company, bank finance should be restricted to 50 per cent of the finance required for acquiring the promoter's stake in the company being acquired.

(e) Finance extended should be against the security of the assets of the borrowing company or the assets of the company acquired and not against the shares of that company or the company being acquired. The shares of the borrower company/company being acquired may be accepted as additional security and not as primary security. The security charged to the banks should be marketable.
(j) Banks should ensure maintenance of stipulated margin at all times.

(g) The tenor of the bank loans may not be longer than seven years. However, the Boards of banks can make an exception in specific cases, where necessary, for financial viability of the project.

(h) Financing would be subject to compliance with the statutory requirements under Section 19(2) of the Banking Regulation (BR) Act, 1949.

(i) Banks financing acquisition of equity shares by promoters should be within the regulatory ceiling of 5 per cent of the capital market exposure in relation to its total outstanding advances (including commercial paper) as on March 31 of the previous year.

(j) Proposal for bank finance should have the approval of the Board.

2.11.3.4 Prudential requirements

2.11.3.4.1 Assignment of Risk Weight for Capital Adequacy Purposes: Banks assign a concessional risk weight of 50 per cent for capital adequacy purposes, on investment in securitized paper pertaining to an infrastructure facility subject to compliance with the following:

2.11.3.4.2 Asset-Liability Management (ALM): The long-term financing of infrastructure projects may lead to asset-liability mismatches, particularly when such financing is not in conformity with the maturity profile of a bank’s other liabilities. Banks would, therefore, need to exercise due caution on their asset-liability position to ensure that they do not run into liquidity mismatches on account of lending to such projects.

2.11.3.4.3 Administrative Arrangements: Timely and adequate availability of credit is a prerequisite for the successful implementation of infrastructure projects. Banks/FIs should, therefore, clearly delineate the procedure for approval of loan proposals and institute a suitable monitoring mechanism for reviewing applications pending beyond the specified period. Multiplicity of appraisals by each and every institution involved in financing, leading to delays, has to be avoided and banks should be prepared to broadly accept technical parameters laid down by leading public financial institutions. Also, setting up a mechanism for an on-going monitoring of the project implementation will ensure that the credit disbursed is utilized for the purpose for which it was sanctioned.
2.11.3.4.4. Asset Classification Norms: In terms of these norms, for the infrastructure projects, financed by the banks / FIs after May 28, 2002, the date of completion of the project should be clearly spelt out at the time of financial closure of the project. In such cases, w.e.f. March 31, 2008, if the date of commencement of commercial production/operation extends beyond a period of two years after the date of completion of the infrastructure project, as originally envisaged at the time of initial financial closure of the project, the account should be treated as a substandard asset. Thus, if a project is approaching the said two-year period, banks are expected to undertake a viability study of the project to assess its eligibility for restructuring, and, if necessary, consider restructuring the asset to ensure that the asset quality is maintained. In case the project needs to be restructured, the restructuring would be governed by the RBI Circular DBOD, No.BP.BC. No.37/21.04.132/2008-09 dated August 27, 2008 on “Prudential Guidelines on Restructuring of Advances by Banks”. These guidelines also provide for special regulatory treatment for asset classification of the restructured account provided the conditions stipulated therein are complied with.

2.12. Measurement of Risk

Mr. Alan Greenspan, Chairman, US Federal Reserve, in April 2004 had made an interesting comment before the Senate Committee:

“Only through steady and continued progress in measuring and understanding risk will our banking institutions remain vibrant, healthy and competitive in meeting the growing financial demands of the nation. Therefore, the regulatory authorities must provide the industry with proper incentives to invest in risk management systems that are necessary to compete successfully in an increasingly competitive and efficient global market.”

Risk management is, first and foremost, a science. If the banks use **accurate data**, **reliable financial models** and the **best analytical tools**, they can minimize **risk** and make the **odds work in their favour**.

Risk Management is the **identification** and **evaluation** of risks to an organization including risks to its **existence**, **profits** and **reputation** (solvency) and the **acceptance**, **elimination**, **controlling** or **mitigation** of the **risks** and the **effects** of the risks. It is a product of **Probability of default**, **Loss Given default** and **Exposure at default**.
Risk Management helps in increasing Bank Competitiveness and Performance, augments in Shareholder Value Creation and is also a Regulatory Compliance Tool (Basel II Accord).

2.12.1 Basel II and Specialized Lending: As per Basel II, a distinct class of lending called Specialised Lending is defined which possesses all the following characteristics, either in legal form or economic substance:

- The Exposure is typically to an entity (often a Special Purpose Entity).
- The Borrowing Entity has little or no material assets/activities and therefore little or no independent capacity to repay the obligation, apart from income received from asset(s) being financed.
- The Terms of Obligation gives the lender substantial degree of control over the assets and the income it generates.

As a result of the above, the primary source of repayment is the income generated by the asset, rather than independent capacity of a broader commercial enterprise.

Specialized lending has five distinct risk classes: (i) Project Finance, like the one employed in infrastructure sector, wherein the lender is usually paid solely or almost exclusively out of the funds generated by the contracts for the facility's output, for example the electricity sold by a power plant; (ii) Borrower usually an SPV is not permitted to perform any other function other than develop, own and operate the installation. The consequence of this is that repayment depends on project cash flow and collateral value of the project assets; (iii) Object Finance which means financing of big project outputs (objects) like aircrafts, satellites, etc., where the repayment is dependant on the cash flows generated from the object; (iv) Commodities Finance, and (v) Real Estate and High volatility Real estate.

Basel II has given the following supervisory slotting criteria based on parameters such as: 1. financial strength, 2. political and legal environment, 3. transaction characteristics, 4. strength of sponsor, and 5. security package. Each of these is rated on the above 5-point criteria. This rating is based on many parameters specified under each of the above.

The Basel II has prescribed the following risk weights:
Table 2.1: Risk Weights for Specialized Lending Prescribed by Basel II

<table>
<thead>
<tr>
<th></th>
<th>Strong</th>
<th>Good</th>
<th>Satisfactory</th>
<th>Weak</th>
<th>Default</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>70%</td>
<td>90%</td>
<td>115%</td>
<td>250%</td>
<td>0%</td>
</tr>
</tbody>
</table>

which correspond to the following rating scale (credit assessments):

Table 2.2: Rating Scale Corresponding to Risk Weights (Specialized Lending)

<table>
<thead>
<tr>
<th></th>
<th>Strong</th>
<th>Good</th>
<th>Satisfactory</th>
<th>Weak</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BBB- or better</td>
<td>BB+ or BB</td>
<td>BB- or B+</td>
<td>B to C-</td>
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</tbody>
</table>

As Basel II advises banks to use an internal rating model to measure risk, the researcher will look at credit rating mechanism as practised by the Indian banks. However, it may be noted that the Indian banks as of now are following the standardized approach to lending, hence, the internal rating-based approach is not applicable.

2.13 Assessment of Risk by credit rating mechanism

There are two generic approaches practised by the banks. The first is the Standardized approach which is a tool for measuring credit risk to facilitate specific regulatory capital requirements. For this the counter parties in credit exposure are classified into three categories: Sovereign State, Banks and Corporates. This approach provides for preferential risk weights for each credit exposure in the range of 0–20–50–100–150 per cent, depending on the type of exposure and the availability of risk mitigants.

The second is the Internal Rating Based (IRB) approach where the focus is more on risk-sensitivity of exposures to provide discretion to use internal inputs to assign preferential risk weights. It has two versions – Foundation and Advanced approach. There are six exposure types: (i) Sovereign states, (ii) Banks, (iii) Corporates, (iv) Retail, (v) Project Finance, and (vi) Equity. As Indian banks move from standardized approach to foundation IRB approach rating models and its correlation with Probability of Default (PD), Loss Given Default (LGD) and Exposure at Default (EAD) becomes critical.

Rating implies an assessment or evaluation of a person, property, projects or affairs against a specific yardstick or benchmark set for the purpose (Baghchi, 2005). A sound credit
policy should necessarily address: Exposure, Concentration, Spread, Correlation, Default and Recovery issues.

In credit rating the objective is to assess/evaluate a particular credit proposition on the basis of certain parameters. These are classified into various grades according to the yardstick/benchmark set for each grade. Credit rating involves both quantitative and qualitative evaluations.

The Basel committee 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 default of counterparty by considering relevant quantitative and qualitative information. Thus, credit rating is a tool for the measurement or quantification of credit risk. Basel II has summed up the utility of credit rating in this way.

"Internal Risk ratings are an important tool in monitoring credit risk. Internal risk ratings should be adequate to support the identification and measurement of risk from all credit exposures and should be integrated into an institution's overall analysis of credit risk and capital adequacy. The rating system should provide detailed rating for all assets, not only for criticized or problem assets. Loan loss reserves should be included in the credit risk assessment of capital adequacy."

As an adequate credit rating directly corresponds to a degree of risk, and it is often used in transaction level pricing, utmost objectivity has to be maintained. Michael Couhy (Risk Management, p 270) says: "The goal of credit scoring is to generate accurate and consistent risk ratings, yet also to allow professional judgment to significantly influence a rating where this is appropriate."

Therefore, credit rating is often used by banks as an ideal mechanism to assess transaction and portfolio level risks.

2.13.1 Other Methods to Assess Risk: Lending institutions take four types of major credit decisions: (i) Sanction or extension of existing credit limits, (ii) Liquidation, (iii) Foreclosure and (iv) Renegotiation. In all these decisions, the central task is to anticipate failure or success of a borrowing entity, because the prospect of recovery of the loan is itself tied to the business fortunes of the borrower. In taking these decisions, banks and financial institutions carry out an extended credit appraisal exercise using both qualitative and quantitative information about the borrowing firm and its business environment. Finally, when all factors
are weighed, the actual decision is made on the basis of judgment. Most bankers maintain that the loan granting is a judgmental call. Currently, there is evidence of an increasing interest among lenders in the analytical or quantitative tools that can help them take lending decisions more professionally. The use of quantitative or analytical methods provides demonstrative evidence of exercise of diligence in sanctioning loans. Need for such evidence is felt acutely by executives haunted by anxiety of staff accountability. Banks hope to crank up their lending functions - now showing signs of paralysis - back to life, by using reliable analytical tools. For a summary of the ideas of this school of management thought, Roy Rowan's *The Intuitive Manager* is referred to.

The quantitative support systems based on discriminant analysis are finding popular use in credit decisions. Multiple Discriminant Models are a result of empirical studies which aim at identifying attributes of business firms that can predict their failure or success. In other words, these models skim and scan over the borrowing entity and identify surface characteristics, on the basis of which they attempt to forecast how firms will fare. A summary of discriminant analysis made in the last three decades is available in a paper by V. Nirmala and others (1995). A scrutiny of past research shows that these models were developed specifically for banks and were employed only for credit decision making of larger magnitudes. The authors differentiated their approaches by choosing different sample sizes and population group of firms, applying different definitions of failures and non-failures (bankruptcy, loan default, etc.). There are basically two main discriminant methods – Univariate and Multivariate.

*Univariate Model:* Under this model, a single variable is selected and tested for its ability to distinguish failed from non-failed firms. If the distribution of the variable for failed firms differs from that of non-failed firms in a discernible manner, the prediction model can exploit the difference and reduce both Types I and Type II errors which may happen while giving credit (Sampath Raj, GC, 1999; Beaver, 1968). Zmijewski (1984) made a survey of some univariate models where he tried to test the selected ratios for their predictive powers by calculating the means of distribution and F Test scores. W H. Beaver also conducted a study of four ratios, applying them on samples of “companies before failure”, over periods ranging from one to five years. The ratios were also tested for both failed and non-failed firms. The ratios tested were: (a) Cash Flow/Total Debt, (b) Total Debt / Total Assets, (c) Working Capital/ Total Assets and (d) Current Ratio. The test revealed interesting results. Cash Flow/Total Debt and Leverage ratios showed the most predictive powers.
In India one major work in the univariate area is a paper prepared under the auspices of ICICI by Dr L.C. Gupta who later augmented and published the work. He used a paired sampling technique and tested 63 financial ratios for credit appraisal. Gupta also ranked them in the order of their predictive power. According to him, some of the best ratios are: EBDIT (Earnings before Depreciation Interest Taxes) and Amortization/Sales and Operating Cash Flows/Sales.

**Multivariate Models** combine information with several financial variables into a single predictive score known as Z-Score which is calculated by using a set of mathematical formulae. The Z-Score is then used in 2 ways:

(a) Prescribe a suitable cut-off point in the same way as for single variable by assigning weights to Type I and Type II errors.

(b) Convert it into a probability measure as advocated by Merton.

Most of the recent studies in discriminant analysis were done in the multivariate area. The research works are diverse in nature not only in terms of techniques employed, but also in the variables used. Zmijewski (1984) made a survey of some of the major models and his findings reveal one notable fact. Most of the models have high percentage of predictive success for the non-bankrupt (non-failed) sample group, whereas it is not so in the bankrupt (failed) sample. This indicates a likely bias in the sample selection, since larger numbers of non-bankrupt firms constitute the samples and there are inadequate readings for the non-bankrupt group. Altman estimates that the cost of Type I is 35 per cent of Type II costs (1977). Another successful model (Altman, Holdman and Naraynan, 1977) was employed by an agency called Zeta Services which furnishes “Zeta Credit Risk” reports on subject firms for its clients. Another study (Dietrich and Kaplan, 1982) attempted to classify corporate borrowers of a bank into four categories – current, irregular, substandard and doubtful. Ample research studies have been done in this area notably by Beaver, 1966; Altman, 1968; Blum, 1974; Dombolena, 1980; Zmijewski, 1983; and also by Altman and Holdman.

Project finance lending is often viewed more risky than corporate finance lending. The premise for this view is that the ability of a single asset to generate cash is less certain than a corporation’s ability to generate cash from a presumably diversified base of assets, customers and revenue streams. Furthermore, Greenfield projects are viewed as equivalent to start ups with no operating history and significant construction risks (Dymond, 2003). The best
quantitative data on project finance default and recovery rates come from the recent response to the Basel Committee's proposed new risk for project financing (Esty, 2002). Four leading project finance banks provided loan data to Standard and Poor's Risk solutions to analyse the historical probability of default (PD) and Loss Given Default (LGD) for their aggregate loan set Combined. These banks represent 24 per cent of the global project finance market. The results of the study are striking. The 10-year cumulative default probability for project finance loan was calculated to be 7.5 per cent – a rate equivalent to BBB+, rated as corporate unsecured loans. Recovery rates are even more striking: the mean LGD was 25 per cent and the median was 100 per cent. In other words, once a project finance transaction has defaulted, the average outcome for the lenders is a recovery rate of 75 per cent of the exposure, and the most frequent outcome is a 100 per cent recovery of loan value. These recovery rates exceed recovery rates for secured and unsecured corporate loans with equivalent default probabilities. Most of these data are publicly unavailable.

There may be numerous causes of default in the case of infrastructure loans which may fall into the following categories: Failure to complete construction, Poor technical operating performance of the asset, Non-payment by the off-taker or other contractual counterparty delinquency, Decline in market price of output and so on. Optimization of the infrastructure asset may be a solution (Patten, Hahn, 2003). However, in the infrastructure finance, little work is done as far as measurement of credit risk is concerned. In the global context, Development of Basel II Conforming Model was developed by Jorg Orgeldinger (Basel II and Project Finance, Winter 2006). Standards and Poor's use a framework of analysis that extends well beyond traditional approach of rating projects in the power sector (Standard and Poor's, 2001). Fitch applies project finance ratings to different types of projects including telecommunications, power projects, toll-roads, mines and pipelines. He divided the risk into several components: sponsors, pre-completion, operation, off-take, structural, etc. (Fitch, 2001). The World Bank has developed the software – INFRISK – for the rating of project risk (Dailami et al, 2002). However, in the Indian context, except for some articles, not much research work has been done particularly with regard to measurement of risk. However, there is enough literature available on the need for investment in infrastructure.

2.14. Gaps in the Existing Literature

Against the above backdrop, a need is felt to undertake further research in order to fill the information gaps in literature with particular reference to:
(a) The need to shift from “Why” to “How”, particularly from the point of view of appreciation of project structure by commercial banks.

(b) The Reserve Bank of India’s clear advice to the banks is to have greater exposure in infrastructure sector after careful and due diligence. This suggestion needs adequate understanding of the new project structure, which is complex and elaborate. In order to safeguard bank’s capital, the RBI has laid down stringent asset classification norms. In this regard, the present research will fill in the lack of knowledge and skill that will help bankers face the task of appraising and financing infrastructure projects confidently.

(c) The identification and incorporation of sector specific and unique risks faced by commercial banks in project appraisal.

(d) The gaps in techniques of risk measurement in infrastructure projects, particularly with reference to the credit rating mechanism at a single transaction level. The research will focus on credit rating mechanism as the rating class directly corresponds to capital adequacy and pricing of loans. It becomes even more critical as banks prepare to move from the foundation IRB approach to the advanced IRB approach.

(e) The existing economic bottlenecks that prevent commercial banks from financing infrastructure projects. Appropriate suggestions will be offered to overcome the potential problems in project finance.

(f) The organizational preparedness to promote infrastructure financing in a big way will be discussed and possible methods will be suggested.

In the next chapter, the project appraisal of infrastructure projects and risk measurement techniques used by bankers are discussed, based on descriptive research carried out by the researcher.