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## UNIT 11: PROJECT FINANCING

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### STRUCTURE

- 11.0 Objectives
- 11.1 Introduction
  - 11.1.1 What is Project Financing
  - 11.1.2 Requirements for Project Financing
  - 11.1.3 Ideal candidates for Project Financing
  - 11.1.4 A Caselet on Konkan Railway Project
- 11.2 Rationale for Project Financing
  - 11.2.1 Need for SPV
  - 11.2.2 Need for Contractual bundling
  - 11.2.3 Free cash flow conflict
  - 11.2.4 Efficient structuring of debt contracts
  - 11.2.5 Reducing asymmetric information & signaling cost
  - 11.2.6 Project Finance vs. corporate finance
- 11.3 Risk identification, assessment, and mitigation in Project Finance deal structuring
  - 11.3.1 Completion risk
  - 11.3.2 Technological risk
  - 11.3.3 Raw material supply risk
  - 11.3.4 Operation and maintenance risk
  - 11.3.5 Economic risk
  - 11.3.6 Financial risk
  - 11.3.7 Currency risk
  - 11.3.8 Political risk
  - 11.3.9 Environmental risk
  - 11.3.10 Force Majeure risk
  - 11.3.11 Implications for Project Financing
- 11.4 Financial Modeling
  - 11.4.1 Cash flows to equity & Cost of equity valuation Approach
  - 11.4.2 Monte Carlo Simulation approach to assess risk
- 11.5 Case Study of Noida Toll Bridge
  - 11.5.1 The Project history
  - 11.5.2 The Sponsors of the Project
  - 11.5.3 Project Cost
  - 11.5.4 Project Financing

11.5.5	Fiscal benefits to SPV
11.5.6	Risk Identification, Assessment & Mitigation
11.6	Let us sum up
11.7	Key Words
11.8	Terminal Questions / Exercises

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## 11.0 OBJECTIVES

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After studying this unit you will be able to

- Explain project finance and how it is different from corporate finance;
- Discuss the requirements for project financing and which are the ideal projects for such financing;
- Explain the rationale for project finance, identify, assess, and mitigate different kinds of project risks while structuring the deal;
- Differentiate Project Finance valuation methodology from the corporate finance valuation methodology?

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## 11.1 INTRODUCTION

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### 11.1.1 What is project financing?

Project finance is a vehicle to raise funds through loans for mega projects in power, telecommunications, roads, railways, theme parks, airbus, oil & gas and other infrastructure sector. It is based on lending against project cash flows rather than on the strength of the sponsors' or promoters' balance sheet. The debt ratio in case of project finance is very high in order to discipline the management and reduce agency cost. It ranges from 60% to 95%.

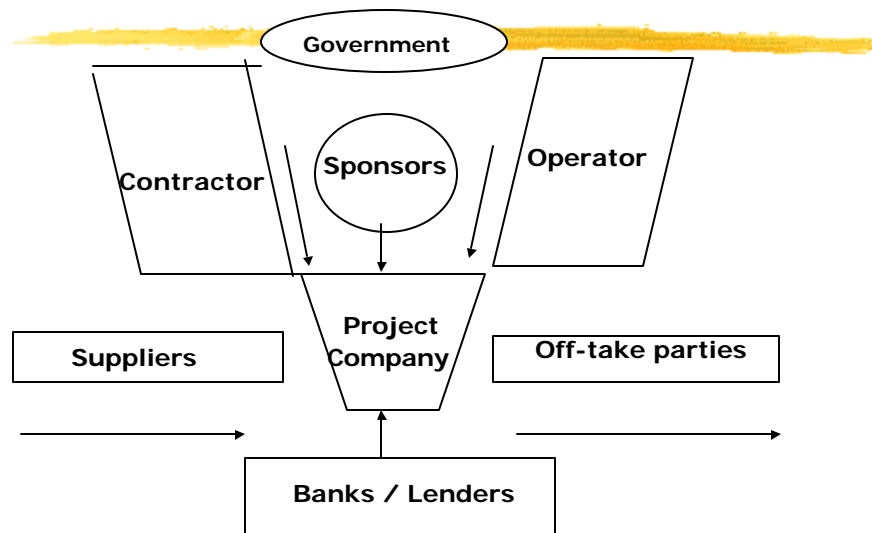
To use the concept of project finance, a special purpose vehicle (SPV) is created. For example, in case of Konkan Railway project, Konkan Railway Corporation Limited was created under the Companies Act, 1956. Similarly, in case of Noida Toll Bridge, Noida Toll Bridge Company Limited has been created.

The project assets and project cash flows are segregated from the sponsors. There are agreements between the SPV and the lenders, sponsors, raw material suppliers, off-take parties, government,

operation & maintenance (O&M) contractor, and engineering, procurement & construction (EPC) contractor. It is termed as contractual bundling. The transaction cost in project finance is as high as in case of mergers & acquisition deals.

It uses financial engineering, in the form of contractual bundling, in risk sharing amongst different stakeholders and their mitigation. In case of project finance, the risk is very high. The common wisdom is that it is high risk, which brings high-expected return. The paradox in case of Enron Power project in India was that it was high return that caused high risk. Thus, sponsors do not expect high return but try to share the risk amongst all the stakeholders by structuring the deal.

## Project Finance



In project finance, the life of the project is finite. As in case of Noida Toll Bridge project, the concession period given to the sponsors by the Government for the operation of the project is 20 years. In these 20 years, the sponsors have to recover their original investment and return on that investment. At the end of the concession period, the project assets will be transferred back to the Noida Administration.

It is a new financial discipline, which has developed over the last two decades.

### 11.2.1 Requirements for Project Financing

In case of project finance, no project history or past operating data is available. The creditworthiness of the project depends on projected profitability and indirect credit support provided by the sponsors, lenders, EPC and O&M contractors, raw material suppliers, off-take parties and the government.

The lenders get comfort by having completion guarantees from the sponsors. The sponsors assure the lenders that project will be completed within stipulated time and cost framework. If it does not happen, the lenders will have recourse to sponsors' balance sheets for their claims.

If project is completed within stipulated time and cost framework, thereafter lenders have no claim to the sponsors' balance sheets. Their claim will be met out of project cash flows and project assets. Thus, the lenders provide limited recourse finance during the construction period of the project and no-recourse finance to the project after its successful implementation

## **1 Technical Feasibility**

The lenders want to satisfy themselves that the technology used for the project is proven technology, environmental friendly and is capable of operating at desired level of production. For this purpose, they need an opinion of independent consultants, and engineering firms.

## **2. Economic Viability**

The lenders want to be assured that project will be put to operation successfully on stipulated date and will generate free cash flows to service the debt and provide the required rate of return to the sponsors after keeping reserves for operation and maintenance. Further, there should be long-term demand for the project output and there must be an off-take agreement with the customers.

## **3. Availability of Raw Materials**

The raw materials and other inputs required to manufacture desired level of output over the life cycle of the project should be available. The project SPV may enter into an agreement with the raw material suppliers to share the input risk. If the project uses natural resources such as oil reserves in case of oil & gas project, bauxite reserves in case of aluminum project, the project SPV may enter into an agreement with the Government for use of natural resources over the life of the project.

## **4. Competent Management**

The project entity must have competent management in place in order to ensure successful execution of the project. If it is not there, then Project SPV must enter into an agreement with the engineering firms. For example, in case of Hong Kong Disneyland Project, the project has to be operated by Disney against a management fee.

### **11.2.2 Ideal Candidates for Project Financing**

The ideal candidates for the project financing are those projects that

- are capable of being operated as independent economic units in a company form of organization
- could be successfully completed without any uncertainty
- are positive NPV projects to the sponsors

A few examples of these projects are:

- Rs 1400 crore Konkan Railway Project: Construction of 768 Kms long railway line between Roha in Maharashtra to Mangalore
- Rs 408.2 crores Delhi Noida Road Bridge
- \$13 billion Airbus A380 project of Airbus: World's largest commercial jet
- \$2.4 billion Oil-field development Petrozuata project in Venezuela
- \$1.4 billion Mozal Project in Mozambique: Aluminum smelter
- \$4 billion Chad-Cameroon Petroleum Development & Pipeline Project
- \$2 billion Petrochemical Plant in Kuwait known as Equate Petrochemicals Project
- Euro 934 million Poland's A2 Motorway

### **11.2.3 Structuring of Project Finance**

A Project firm is responsible for completing an assigned task on schedule within cost and according to established standards. Project structures can take various forms; exemplified by functional, matrix or task force. They can be clumped or severed depending on the need of the firm. The classic structures fundamentally prevail in project :

Functional or hierarchical organisation : Reportedly the most common type of organisation in the world is pyramid shaped, with stratified management levels subordinated by distinct horizontal tiers. Work activities are divided functionally by specialists and disciplines.

Task Force Organisation : Under this type of structure human resources are pooled for a project team are largely repeated from other personalities, and centralized project management directs the project efforts.

Matrix or Horizontal Organisation : The matrix organisation is a hybrid structure aimed at optimising strengths and minimizing weaknesses of functional structure in which extended lateral mobility exists. This type can accomplish complex or different projects. It is better to have a completely autonomous organisation called "Completely projectised organisation" rather than partially projectised organisation.

In a project, the organisation team working is important whatever be the structure of the firm. The project teams are not static groups. The team should be an aligned, cohesive and energetic. Line organisation, line and staff organisation and functional organisation are generally suitable to firms where activities are stereotypes and continuous. The above three types are suitable for capital intensive projects.

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## 11.3 RATIONALE FOR PROJECT FINANCE

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When a firm is undertaking a capital investment project, the issues before it are:

- Should the project be taken on firm's balance sheet or as a separate strategic business unit be having a separate legal entity?
- What should be the debt on the balance sheet of separate legal entity?
- How should the loan agreements be structured? Should the lenders have full recourse or no-recourse to the sponsors' balance sheets for their claims?

### 11.2.1 Need for SPV

When a company has multiple projects on its balance sheet, the ability of sponsors to control the operations of the company gets affected. In case of company form of organization, there is separation of ownership from the management.

The management may use free cash flows to maximize sales and assets through unrelated diversification, which may not necessarily create shareholders' wealth. The management may pay themselves the high salaries and perquisites.

To discipline the management, a separate organizational entity is created. The management of SPV enters into an agreement with the sponsors to pay all free cash flows to equity as dividends.

The project has a finite life so does the SPV. The SPV ceases to exist at the end of the project life or concession period. In case of corporate finance, the assumption is going concern. The entity has neither the necessity nor the intentions to discontinue its operations in the near future.

### **11.2.2 Need for Contractual Bundling**

Project finance deal structuring involves agreements between the SPV and all the stakeholders i.e. lenders, sponsors, providers of raw materials and other inputs, engineering, procurement & construction contractor, operation & maintenance contractor, customers & off-take parties, and the government.

The project financing arrangement will be successful if it is in the best interest of all the stakeholders i.e. "commonality of interests" must be there.

In the case of Petrozuata Project, the Conoco (oil & gas subsidiary of EI Du Pont & Company and one of the sponsors of the Petrozuata project) wanted assured supply of crude oil for 35 years for one of its refinery. The Venezuelan government wanted to develop its oil & gas sector. Venezuela is rich in terms of availability of heavy, extra-heavy crude oil. They required US\$65 billion for developing the sector. Hence, they want foreign participation in this sector. Hence, the Petrozuata project was taken up in joint venture with PDVSA, the oil & gas PSU of Venezuela.

### **11.2.3 Free cash flow conflict**

In a corporate finance each project is though separate SBU but not a distinct entity. Hence, all projects appear on the balance sheet of the company.

The board of directors determine as to how the free cash flows will be used, whether for distribution as dividends amongst the shareholders or for reinvestment for growth and diversification. The free cash flows are cash flows generated by the operations of the company after meeting all operating expenses including taxes and normal capital expenditure and net working capital needs.

There is growing concerns that management may not use these free cash flows in the best interest of the shareholders. They may go in for unrelated diversification either through green-field projects or through mergers & acquisitions. The unrelated diversification may destroy shareholder value, though it may ensure perquisites and long-term job contracts for the management.

In project finance, each project is a separate legal entity. The management of a SPV enters into an agreement with the sponsors to distribute all free cash flows to equity as dividends. Hence, project finance creates value by avoiding free cash flow conflict.

#### **11.2.4 Efficient structuring of debt contracts**

There is inherent conflict of interests between the shareholders and lenders. The concern is that management may act in the interest of the shareholders at the expense of lenders. The management may go in for high-risk negative NPV projects or may reject low-risk positive NPV projects and in the process value migration from lenders to shareholders may take place.

In project finance SPV enters into an agreement with the lenders wherein certain covenants restricting the freedom of the management are provided. These covenants pertain to cash waterfall, dividend policy, debt ratio, maintaining a particular level of working capital and diversification programme.

The cash waterfall covenant is like maintaining an escrow account, where all revenues are deposited. The trustees manage this account. They first meet the operating expenses and keep reserve for three months for operating expenses. Then, claim of the lenders is met and reserve for next six months for debt service is maintained. Thereafter, the residual cash flows are distributed as dividends. This arrangement gives a lot of confidence to the lenders.

The debt ratio covenant is that debt ratio will not exceed agreed upon level. In project finance, it will be very high in the beginning say 60% to 90% in year 1 and then reduce gradually every year, as loan is paid off. It will reduce to zero by year 12 or 15, as by that time the entire loan will be paid off.

The dividend policy covenant is that only residual cash flows after maintaining reserves for operating expenses and debt service will be paid to sponsors as dividends. If in a particular year, the dividend payment amount exceeds the debt service, the dividend payment amount will be restricted and excess cash flows will be used for retiring the debt.

The working capital covenant is that SPV will maintain a particular level of working capital by bringing in sponsors' contribution. The SPV will not diversify, as project finance deal is for a particular project. The entity will cease to exist, once the concession period is over.



In case of Petrozuata project, by structuring the debt contract more efficiently, they were able to get BBB credit rating as against B rating of Venezuela government and PDVSA, one of the sponsors of the project. By doing so, they were able to raise debt at 200 basis point lower than what was the rate for B credit rating.

### 11.2.5 Reducing asymmetric information & signaling cost

There is information asymmetry regarding future performance of the project between the management and the capital market. Further sharing information with the market on project may result in losing competitive advantage.

In project finance, when SPV raises a huge debt, it provides a signal to the market that the project is expected to generate sufficient cash to service the debt in a timely manner. In case of debt, SPV has agreed upon to make contractual payments. Thus, issuing debt instead of equity in case of high-risk projects provides a positive signal to the market and reduces information asymmetry.

### 11.2.6 Project finance vs. corporate finance

Criterion	Corporate Finance	Project Finance
Organization	<ul style="list-style-type: none"> <li>Each business is separate SBU but not a separate legal entity. Hence all projects assets &amp; cash flows are reported together in the balance sheet.</li> <li>The cash flows of each project are mixed up together</li> </ul>	<ul style="list-style-type: none"> <li>Each project is a separate legal entity</li> <li>Project specific cash flows and assets are thus segregated and reported separately</li> </ul>
Monitoring & Control	<ul style="list-style-type: none"> <li>The Board of Directors of the company monitors and control the overall performance</li> </ul>	<ul style="list-style-type: none"> <li>The agreements between SPV and the different stakeholders guide and rather disciplines the Board of Directors to monitor and control the performance</li> </ul>
Debt ratio	<ul style="list-style-type: none"> <li>Generally it is very low.</li> </ul>	<ul style="list-style-type: none"> <li>Generally it is very high in order to reduce the agency cost</li> </ul>
Risk sharing	<ul style="list-style-type: none"> <li>The lenders have</li> </ul>	<ul style="list-style-type: none"> <li>The lenders have no</li> </ul>

	<p>recourse to the sponsors' balance sheet if a particular project fails, since the failed project was part of company's balance sheet</p>	<p>recourse to the sponsors' balance sheet, once the project has been successfully implemented</p> <ul style="list-style-type: none"> <li>• The lenders have recourse to project assets and project cash flows for meeting their claims</li> </ul>
Structure of debt contracts	<ul style="list-style-type: none"> <li>• The lenders consider the company's assets and cash flows while deciding whether to fund a particular project or not.</li> </ul>	<ul style="list-style-type: none"> <li>• The lenders decide on the strength of the project assets and future cash flows expected to be generated by the project.</li> </ul>
Financial flexibility	<ul style="list-style-type: none"> <li>• The company can raise finances quickly, as debt capacity may not have been fully exhausted, since a large number of projects are there on its balance sheet</li> <li>• The internally generated funds could be used for new projects</li> </ul>	<ul style="list-style-type: none"> <li>• The financing arrangements are highly structured and involves lot of transaction cost</li> <li>• No new debt can be raised, once financial closure has been reached</li> <li>• The residual cash flows are to be distributed as dividends and cannot be ploughed back.</li> </ul>
Life	<ul style="list-style-type: none"> <li>• The company is a going concern</li> </ul>	<ul style="list-style-type: none"> <li>• The SPV has a finite life and comes to an end once the concession period is over.</li> </ul>
Free Cash Flows	<ul style="list-style-type: none"> <li>• The Board of Directors of the company has to decide how much of the free cash flows to be paid as dividends and how much to be reinvested.</li> </ul>	<ul style="list-style-type: none"> <li>• The management of SPV has no choice because of the MOU</li> <li>• It has to pay all equity cash flows as dividends</li> </ul>

## 11.2.

### Project Finance Arrangement

A Project passes through following stages

- 1) Project feasibility
- 2) Project finance
- 3) Project Implementation
- 4) Project Evaluation

The typical structure of project finance is as follows :

- a) A single purpose project company is formed to build and operate the project. The shares in the project company are owned by the project sponsors who enter into a shareholders or joint venture agreement between themselves governing their rights and duties as participants.
- b) A syndicate of banks or financial institutes enter into a credit agreement to finance the construction of the project. The banks are paid out of the proceeds of the project after completion. These are several classes of lending banks e.g. foreign banks, local banks, export credit guarantee agencies and international agencies like world banks.
- (c) The balance of finance needed is provided by the sponsors, either by way of equity subscriptions or subordinated debt or both.
- (d) The project sponsors may guarantee the loans under full or limited guarantees during the high risk pre-completion period.

The major sources of finance tapped for project can be classified according to maturity of the project i.e, short term, medium term (called term loans) and long term. Projects can be financed either by equity, or by bonds or by loans and credits. Firms may also obtain finance through internally generated funds (reserves and surpluses), public deposits commercial paper, supplier's credit, foreign currency funds and external commercial borrowing. Projects are also financed through lease financing and venture capital. These are many financial institutions helping project finance at all India level e.g., IDBI, EXIM Bank, NABARD, UTI, LIC, SCICI, HUDCO, STCI, REDA, DFHI and so on.

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## 11.3 RISK IDENTIFICATION, ASSESSMENT & MITIGATION IN PROJECT FINANCE DEAL STRUCTURING

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The lenders will identify the various risks associated with the project and look at the quality of assessment on the same and strategies followed to mitigate them by the management of the SPV. The nature of collateral offered for the loan is also evaluated. If they

are comfortable with the process of exercise and its outcome, they may decide to fund the project. Otherwise they may refuse to fund the project.

Risk identification, assessment and mitigation is essential because the project does not have prior established credit record. The risks associated with the project are both business risks and the financial risks.

### **1. Completion risk**

The completion risk means that project may not be completed within time and cost framework. Further, the project may turn out to be technically not feasible and environmental unfriendly. The lenders will be the most sufferers, if the project does not get completed, since the sponsors of the SPV have a limited liability.

The SPV enters into a fixed price agreement with the EPC contractor to mitigate the completion risk. The agreement has bonus clause for early completion and penalty clause for delay in completion. Besides that, the sponsors of the SPV give guarantees for successful implementation of the project. The lenders have full recourse to the sponsors' balance sheet, if project is completed within stipulated time and cost framework.

### **2. Technological risk**

A project's use of complex or untested technology may lead to cost and time overrun. Even if the proposed technology may be the state-of-the-art technology but the industry may be such which is fast evolving. Further the project may not meet the desired quality specifications, at the projected capacity utilization level.

The consultants' report on the technology risk and sponsors' past track record in the use of technology and their completion guarantees will provide comfort level to the lenders.

### **3. Raw material supply risk**

The quality and quantity of resource (natural resource, material, parts supply) availability is critical to the project success. The quantity of resource availability must support the planned life of the project. The quality of resource availability has to ensure smooth operation of the technology.

The independent consultants' estimate of reservoir availability & its quality and an agreement between the SPV and the resource provider for assured supply will provide comfort level to the lenders.

#### **4. Operation and maintenance risk**

The ability of the management of the SPV to successfully operate and maintain the plant after its implementation is important for the project to be successful.

For this purpose, the SPV may enter into an agreement with the specialized agency against a minimum level of fixed fee and a variable fee linked with its operating profits.

#### **5. Economic risk**

The economic risks pertain to market demand for the project output, and its market price. The demand for the product may not be sufficient to service the debt and to provide adequate returns to the sponsors. Further the prices may be very competitive, making the project margins very low for sustaining such a huge debt.

The off-take agreement with the customers over the life of the project for its entire output and low-cost operation & maintenance agreement with the specialized agency will make lenders feel comfortable.

#### **6. Financial risk**

There is a generally very high debt ratio in case of project finance. If most of the debt is floating-rate, there is a possibility that rising interest rates may impair the ability of the firm to service the debt. It is termed as interest rate risk.

The SPV may hedge the interest rate risk either by entering interest rate cap contract or interest rate swap agreement.

#### **7. Currency risk**

The currency risk arises when the project cost and revenue flows are in different currency say cost flows in US\$ and revenues flows are in home currency. In such a situation, a change in exchange rate will impact the project profitability & cash flows and its ability to service the debt.

The SPV may hedge the currency risk by opting for currency forwards or futures agreement.

## 8. Political risk

The domestic government due to political and social pressure may seize the MNC's project assets (known as direct expropriation), seize project cash flows (diversion) or change tax rates & royalty rates (creeping expropriation) and thus affect the project cash flows and returns to lenders and sponsors. Full expropriation was common during the mid 1970s. In today's world of globalization full expropriation is rare but creeping expropriation is possible.

The SPV may involve the domestic government as one of the sponsors and also enter into long-term agreements on royalty rates. As far as tax laws are concerned, they are more or less stable in most of the emerging economies.

## 9. Environmental risk

The environmental risk is present when the environmental impact of the project causes a delay in project completion or necessitates an expensive project redesign. The case of Konkan Railway Corporation highlights various environmental, political as well as religious controversies in the choice of alignment in Goa faced by the SPV. The case argues for integration of environmental assessment in project formulation.

## 10. Force Majeure risk

The Force Majeure events are those events that are beyond the control of the project. These events may be political or non-political such as acts of God. The political events are war, strikes & lockouts, and terrorism. The acts of God are earthquakes, floods, and hurricanes. The Force Majeure risk is loss suffered by the project because of these events.

### i. Implications for Project Financing

The various types of project risks can be classified on the basis of ability to control and nature of risks. R Stulz has discussed such representation along with generic risk management strategies in his

(No market exists) Traffic Volume In case of Noida Toll Bridge	Foreign Exchange risk Interest rate risk (Market exists)	Force Majeure (political events) Currency convertibility Currency devaluation
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Market  
Specific risk  
Or economy  
Specific risks

Project  
Specific  
Risks

Low High  
Ability to control

Fig: Classification of Project Risks

paper titled "Rethinking risk management" published in the Journal of Applied Corporate Finance (Vol. 9, pp.8-24)

Market Specific risk Or economy Specific risks	(No market exists) <b>BEAR</b>	<b>INSURE</b> (Political risk) <b>ALLOCATE</b> (with contract & Profit sharing) <b>DETER</b> (IFC participation)
	<b>HEDGE</b> (Market exists)	
Project Specific Risks	<b>INSURE OR DIVERSIFY</b>	<b>ALLOCTE</b> (with contracts) O&M Contract EPC contract
	Low High	Ability to control

Fig: Generic Risk Management Strategies

## Project Finance Risk and their Allocation

Before financing a project a financial institution carries out a project appraisal study. These studies relate to market feasibility, financial profitability, economic viability, managerial ability and social amenability. On the basis of five `P's the feasibility norms are :-

- (a) Purpose (2) Prospects of growth (3) Payment of loans (4) People's expertise (5) Protection and surety.

The prediction of financial analysis for project definitely relies on the on the overall objectives of the feasibility study, yet to a large extent, this is universally ascribed to the cash flow operations and funds position of a project. The capital role of a financial analyst among team is to monitor and keep tract of various operations viz marketing, engineering, costing, procurement duty payment etc. which affect the routine cash operations as well as total funds position of the project. The financial soundness of a project can be studies form the angle of equity, long term funds and total funds. Equity consideration consist of initial investment, operating cash flows and liquidation and retirement of cash flows. Cash flows relating long term funds position comprise of initial investment, operating cash inflow and terminal cash flow. Total funds position comprise of initial investment, operating cash inflow and terminal cash flow.

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## 11.4 FINANCIAL MODELLING

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The first step in an economic analysis of a project is to calculate the projected cash flows. To do that one has to understand the business model, revenue model and the cost model of the project. One has to make precise forecast of cash flows to arrive at meaningful results. One can use sensitivity and scenario analysis for this purpose.

### ii. Cash Flows to Equity & Cost of Equity Valuation Approach

In project finance the valuation approach suggested use of free cash flows to equity and the rate of discount as cost of equity. The equity cash flows for each year of project life has to be worked out. The cost of equity will vary every year as the firm's debt ratio is very high in the beginning and is close to year by the end of year 12 to 15, when the entire loan will be fully paid off.

The equity cash flows are worked out from cash available for debt service. The computation process is illustrated below with the help of numbers for a particular year of project operation:

<b>Sales revenues</b>	<b>100</b>
Less: Operating cost including manufacturing, administration, marketing & distribution overheads (other than depreciation)	-43
<b>Earnings before depreciation, interest &amp; taxes (EBDIT)</b>	<b>57</b>
Less: Depreciation	8
<b>Earnings before interest &amp; taxes (EBIT)</b>	<b>49</b>



Less: Actual cash taxes	-9
Less: Incremental normal capital expenditure	-5
Less: Incremental Net working capital	-3
Less: Incremental Reserves for 3-months operating expenses	-3
Less: Incremental Reserves for next 6-months debt service	-2
Add: Depreciation being non-cash item	8
<b>= Cash available for debt service (CADS)</b>	<b>35</b>
Less: Interest on loan funds	-6
Less: repayment of loan principal amount	-7
Add: Fresh loan raised during the year if any	3
<b>Free Cash Flows to Equity</b>	<b>25</b>

The lenders look at the debt service coverage ratio (DSCR). The average DSCR of greater than 2 over the project life is considered to be very good. It is worked out as under:

$$\text{DSCR} = \text{CADS} / (\text{Interest} + \text{Loan Principal repayment})$$

The internal rate of return to sponsors (also known as equity IRR) is worked out and is compared against required rate of return to sponsors each year. If equity IRR is greater than required rate of return during all the years of project life, then the project is positive NPV to the sponsors. The process of computation of equity IRR and NPV to the sponsors is as under:

$$\text{Equity IRR} = \sum_{t=0}^n \text{FCFE}_t / (1+r)^t = \text{zero}$$

where r is unknown.

$$\text{NPV to Sponsors} = \sum_{t=0}^n \text{FCFE}_t / (1+k_t)^t$$

Where:

FCFE <sub>t</sub>	=	Free cash flows to equity shareholders or sponsors in Period t
r	=	Internal rate of return
k <sub>t</sub>	=	required rate of return to sponsors in period t
t	=	life of the project in years

Besides above the lenders also take into consideration the payback period and discounted payback period. The credit rating agencies do consider the above parameters in their evaluation studies.

### iii. Monte Carlo Simulation approach to assess risk

The evaluation of project risk depends on the analysts' ability to identify and understand the nature of uncertainty surrounding the key project variables and also on having the tools and methodology to process its risk implications on the return of the project.

The steps required to use Monte Carlo Simulation for assessing project risks are as under:

- Preparation of a model capable of predicting reality
- Selection of key project variables
- Selection of probability distribution & definition of range limits for variable values
- Generation of random scenarios based on assumption set
- Setting of relationships for correlated variables
- Analysis of output of simulation

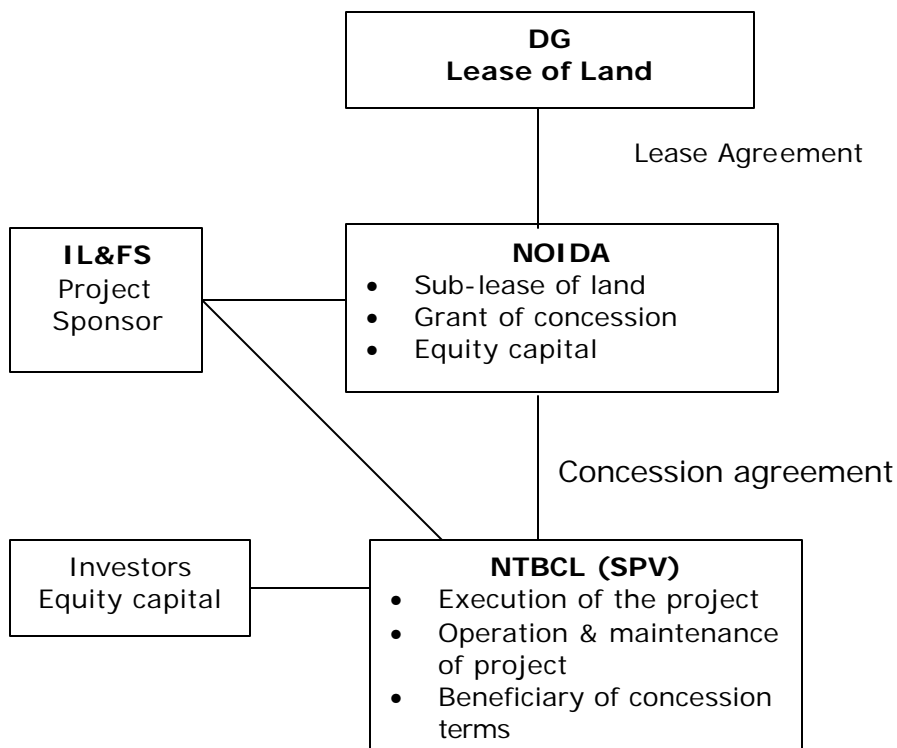
The simulation results will indicate the probability that project will generate positive NPV. The Crystal Ball software can be used for applying Monte Carlo Simulation. The trial version of the software can be downloaded from [www.decisioneering.com](http://www.decisioneering.com)

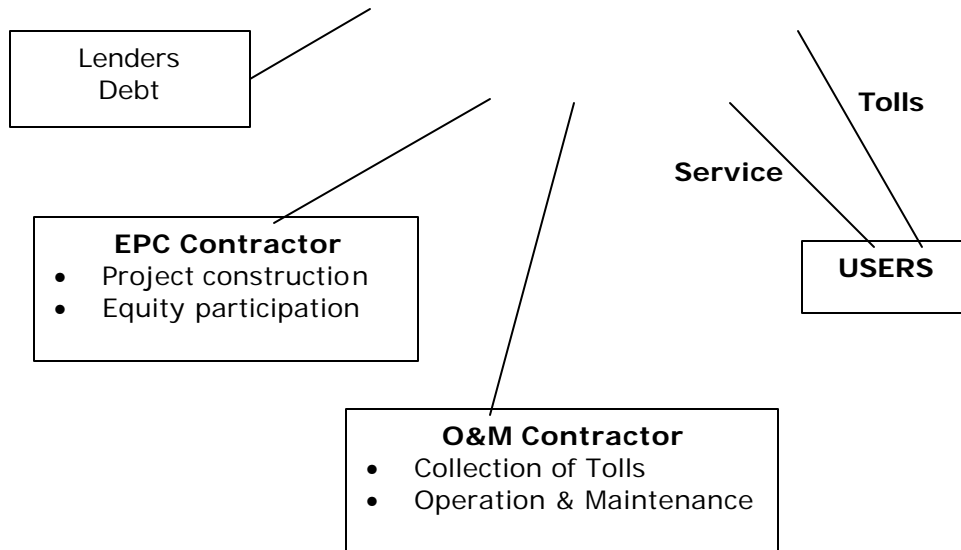
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## b. CASE STUDY ON NOIDA TOLL BRIDGE

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The Noida Toll Bridge being the first project of its kind on build, own, operate and transfer (BOOT) basis as a toll bridge. The construction of the bridge would reduce traffic congestion besides providing a shorter alternative to a large percentage of population in south/east Delhi and Noida, leading to significant benefits in terms of time and cost.





### i. The Project History

Over the last twenty years Delhi has grown and spread in all the directions. Formerly, the river Yamuna formed the eastern boundary of Delhi. In the last few years, Delhi has expanded rapidly beyond the natural boundary and now 30% of the population of the city is located on the eastern side of the river.

New Okhla Industrial Development Authority (Noida) was established in 1976 by the UP government. It being contiguous to East Delhi, Noida has communication and transportation links, which are continuous between Noida & Delhi. Noida's population is expected to touch 1.5 million by the year 2011.

Bridges across the Yamuna at Nizammudin and Okhla barrage served the road transport needs of the Noida area. The unprecedented rapid growth of Delhi, more so in the areas across the river Yamuna and that of Noida has increased the pressure on existing bridges, where the traffic far exceeds the capacity during peak hours.

The main components of the project are Yamuna river main bridge, the toll plaza, the approach roads including the grade separated interchanges and the Ashram flyover with interchanges.

#### 11.5.1 The Sponsors of the Project

The sponsors of the project are IL&FS Limited, NOIDA, IFCI Limited, and Intertoll (O&M contractor). IL&FS is a financial services company with a strategic focus on development of infrastructure project. Noida Toll

Bridge Company Limited (NTBCL) was created as a separate legal entity to implement the project. A concession agreement between the NTBCL and Noida Administration was entered to implement, operate and maintain the project and to determine, levy and collect fees from the users during the 30 years concession period.

#### **11.5.2 Project cost**

The time frame for completion of the project was set at 29 months from the date of the start of the construction. The construction was to commence in January 1999. The base construction cost of Delhi-Noida Toll Bridge is estimated to be Rs.2120 millions based on the negotiations with the bidders. In addition to the project cost, there are other expenses incurred including Ashram flyover cost, pre-operative expenses, financing, insurance and contingencies. The landed project cost is estimated at Rs 4082 millions.

#### **11.5.3 Project Financing**

The project has a debt component of Rs 2857 million and equity component of Rs 1225 million based on debt-equity ratio of 70:30. The debt instrument has been structured on the basis of the toll revenue pattern of the project. Lenders will be secured by recourse to the project assets and revenues stream from the project. The most of debt has been raised at floating rate linked to PLR

#### **11.5.4 Fiscal Benefits to SPV**

An enterprise carrying on the business of developing, maintaining and operating any infrastructure facility gets the tax holiday of 100% of the profits and gains derived from such business for initial period of five years and thereafter, 30% of such profits and gains. The benefits is available for any 10 consecutive assessment years falling within a period of 12 assessment years in which the company begins operating and maintaining the infrastructure facility.

#### **11.5.5 Risk Identification, Assessment & Mitigation**

The Delhi Noida Bridge project is characterized by a long payback period requiring huge capital investment

Land acquisition	<ul style="list-style-type: none"><li>• Obligation of Noida Administration to provide requisite land within 180 days from signing of concession agreement</li></ul>
Project cost risk	<ul style="list-style-type: none"><li>• Significant detailing in the Project report</li><li>• Adequate contingencies provision</li></ul>

Project completion risk	<ul style="list-style-type: none"> <li>• Reputed EPC contractor with adequate track record</li> <li>• EPC contract structured on a fixed time contract with stiff liquidated damages for non-compliance</li> <li>• Comprehensive all risk insurance during construction</li> <li>• IL&amp;FS to cover shortfall due to cost overruns</li> </ul>
Technology risk	<ul style="list-style-type: none"> <li>• Performance bond from the EPC contractor post construction for 12 months</li> <li>• O&amp;M contractor have to meet operation &amp; maintenance requirements</li> <li>• Monitoring by independent engineer</li> </ul>
Risk of shortfall in Traffic	<ul style="list-style-type: none"> <li>• Provision to extend concession agreement in case of non-achievement of 20% return over 30 years period</li> <li>• Concession agreement provides for land development rights to the NTBCL at the discretion of Noida and upon certification by independent auditor / independent engineer, in case of inadequacy of Project revenues from tolls.</li> </ul>
Risk of O&M cost being higher than anticipated	<ul style="list-style-type: none"> <li>• O&amp;M contract is proposed to be a fixed price contract with the risk of cost-overrun to be borne by the O&amp;M contractor</li> </ul>
Force Majeure risks	<ul style="list-style-type: none"> <li>• Comprehensive insurance coverage</li> </ul>

The case is based on the detailed case analysis developed by the Kapil Singhal, Anoop Pabby and Subhash Bana, PTPGPM participants of Management Development Institute, Gurgaon under the guidance of Dr Manoj Anand. Here, the case facts have been presented in brief only.

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## 11.6 LET US SUM UP

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- The growth of project finance over the last 20 years has been driven by the worldwide process of deregulation in public utilities and private sector participation in the infrastructure.
- Project finance structure is unique and differs from deal to deal. There is no such thing as "standard project finance".
- In project finance, a separate legal entity is created to achieve the project goals.
- There is high ratio of debt to equity.
- Lenders rely on the future expected cash flows to be generated by the project. Lenders have recourse to sponsors' balance sheet only if the project is not successfully implemented within time & cost framework.
- The project has a finite life as against going concern concept of corporate finance

- There are large number of agreements in Project finance between SPV and different stakeholders.
- The project finance deal structuring facilitates risk sharing amongst the different stakeholders of the project based on their best abilities.
- The NPV and IRR to equity sponsors is relevant decision criterion in case of Project finance
- Risk identification, assessment and mitigation are critical to project success.
- Monte Carlo simulation could be used to know what is the probability that project will have positive NPV to the sponsors.
- Project finance deal structuring involves use of financial creativity and innovation.

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## 11.7 KEY WORDS

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BOO	Build, own & operate type of project financing
BOOT	Build, own, operate & transfer type of project financing. Noida Toll Bridge is an example of BOOT project financing.
BOT	Build, operate & Transfer type of project financing. Konkan Railway Project has adopted BOT structure. Here depreciation benefit is not available to the SPV.
Break even analysis	Analysis of level of sales at which firm or product will just break-even.
Bridge financing	Interim short-term financing of one sort or another
Capital expenditure	Long-term expenditure for plant, machinery & equipment
Collateral	Assets pledged as a security under a loan agreement to assure repayment of loan
Cost of equity	Cost of equity determined by using either CAPM model or MM proposition II
Covenant	A loan covenant is an agreement by borrower to perform certain acts or refrain from certain acts to safeguard the interests of the lenders.
Debt capacity	The total amount of debt a firm can support on prudent basis after taking in to consideration its future expected cash flows and equity base.
Equity cash flows	$PAT + depreciation - \text{Incremental normal capital expenditure} - \text{Incremental (increase) / decrease in net working capital} - \text{Incremental reserve for operating expenses \& debt service} - \text{Principal repayments of loan}$

Financial leverage	The use of debt in a capital structure
IFC	International Finance Corporation, a subsidiary of the World Bank
Limited recourse Funding	The lenders have recourse to sponsors' balance sheet for repayment of their loan, if the project has not been successfully put to operation or there is time or cost overrun.
Net Present Value	Present value of cash inflows less present value of cash outflows.
No recourse debt	The lenders have no recourse to sponsors' balance sheet for repayment of their loan, once the project has been successfully put to operation

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## 11.8 TERMINAL QUESTIONS / EXERCISES

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1. Give an overview of Project Finance and distinguish it from corporate finance.
2. Discuss the criteria for successful project financing.
3. Why use Project Finance? Discuss
4. Discuss the process of carrying out financial analysis while structuring the deal.
5. Discuss the process of risk identification, assessment and mitigation while structuring the project finance deal.

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