

# Chapter 1

## Introduction

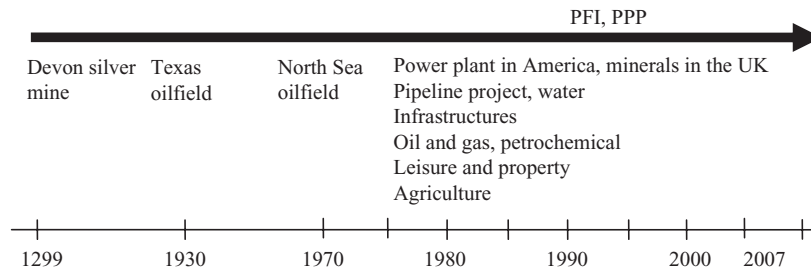
### 1.1 The development of project finance

Project financing is not a new financing method. It has been used to finance industrial projects such as mines, pipelines, power stations and oil fields. An early recorded application of project finance dates back to 1299, when the English Crown negotiated a loan from Frescobaldi, a leading Italian merchant bank, for which payment was to be made in the form of output from the Devon silver mines. The bank received a 1-year lease for the total output of the mines in exchange for paying all operating costs without recourse to the Crown if the value or amount of the extracted ore was less than predicted (Finnerty 1996; Esty 2004). Today, such a loan arrangement is known as a production payment loan.

The brief history of the development of project finance is illustrated in Figure 1.1.

Tinsley (2000) suggests that the modern history of project finance began with production payment financing in a Texas oilfield project in 1930. A driller funded the well-drilling costs in exchange for a share in future oil revenue. This technique was imported into Europe to finance large projects such as the North Sea oilfields in the late 1970s. However, the advent of modern project finance is often regarded as beginning in the 1970s, with the successful development of the North Sea oilfields by British Petroleum, which raised US\$945 million on a project basis from a syndicate of 66 banks (Esty 2004).

At that time, it was the largest industrial loan in history. Following the success of North Sea developments, project finance has been associated with many financial and operating success stories. These include the Ras Laffan LNG project in Qatar (Finance 2005), the Shajiao power station in China (Merna and Njiru 2002) and the Petrozuata heavy oil project in Venezuela, as well as numerous independent power projects (IPPs) in the United States (Esty et al. 1999).



**Figure 1.1** Brief history of project finance (Chu 2007).

Project finance has been evolving, with the potential for significant innovation, especially in the area of collaborative public–private financing (Feming et al. 2004). The private finance initiative (PFI) was introduced to involve the private sector in financing and managing infrastructure projects and service provision in the UK in 1992 (Mustafa 1999).

Project finance has spread worldwide and includes numerous industrial projects such as power stations, gas pipelines, waste-disposal plants, waste-to-energy plants, telecommunication facilities, bridges, tunnels, toll roads, railway networks, city centre tram links and now the building of hospitals, education facilities, government accommodation and tourist facilities. The technique has also been applied to aircraft and ship financing.

The demand for project financing remains high throughout the world. According to Thomson Financial (2006), global project finance loan volumes grew 50.3% to reach US\$88.8 billion from 182 issues in the first 6 months of 2006 and at total proceeds of US\$59.1 billion from 246 issues in the same period of 2005. The power sector remains the industry leader for project finance loans.

The transportation sector increased to US\$24.1 billion borrowings, while the petrochemical sector also produced positive growth from US\$2.8 billion in the first 6 months of 2005 to US\$15.7 billion in the first 6 months of 2006.

According to Platt (2006), high oil prices have contributed to an increase in the number of projects being procured in the Middle East. Project finance deals are booming in the Middle East, some incorporating Islamic finance laws. The Eastern Europe, Middle East

and Africa (EMEA) region led the Americas and Asia-Pacific in mid-year 2006 project finance loan volumes with total proceeds of US\$56.6 billion from 97 issues. In EMEA region, US\$29.1 billion project finance was loaned in the Middle East in 2006 (Thomson Financial 2006). Saudi Arabia has surpassed Qatar as the leading country for project finance in the Middle East. Saudi Petrol-Rabigh project is one of the biggest oil refining and integrated petrochemical projects in the world; meanwhile, it is the largest project financing to date in Saudi Arabia as well as the largest in the region to incorporate long-term Islamic financing.

According to Thompson Reuters (2009), the first quarter of 2008 saw the highest-ever volume of project finance transactions worldwide, with more than 125 transactions totalling US\$56.4 billion. In the first quarter of 2009, global project finance activity sank to its lowest level since 2003. Deals totalled just US\$19.4 billion in proceeds from 69 transactions. Tullow Oil's US\$2 billion deal was the largest transaction during this period. Following record high volumes in 2008, Asia-Pacific project finance totalled US\$5.1 billion during the first quarter of 2009, a 76.3% decrease from the US\$21.5 billion in proceeds raised during the same period in 2008. Power projects accounted for 43.1% of market activity, which was largely driven by Adani Power Maharashtra. The INR55.5 billion project loan was the largest deal in the region and the second largest transaction globally.

The variety of project finance applications and locations and its growth can be summarised as follows:

### Supply side factors

- Privatisation of state-controlled assets across the world.
- Increasing appeal for governments to subcontract infrastructure management and the associated risks.
- Budget constraints limit the ability for public sector investment in capital-intensive developments.
- Backlog of infrastructure investment as governments attempt to raise productivity to meet growing needs.

### Demand-side factors

- Demand for infrastructure assets has risen faster than supply side for a long period, resulting in more highly leveraged transactions and ever-higher valuations.
- Investors have been attracted to the stable, often inflation-linked returns based on predictable underlying cash flows of monopolistic assets.
- Infrastructure is also seen as an alternative asset class (together with private equity, commodities and real estate) for large pension funds and well suited to match their long-term liabilities.
- Global economic growth such as energy consumption.

Merna and Owen (1998) describe three categories of project procurement, which utilise project finance under the UK PFI:

1. **Services sold to the public sector.** The private sector is responsible for capital investment and the public sector only pays on the delivery of specified services to quality standards. These projects are generally procured by the design, build, finance and operate (DBFO) route.
2. **Financially free-standing projects.** The private sector recovers its DBFO contract costs through direct charges to users, for example, a toll bridge, rather than from public sector payments. Public sector involvement is limited to enabling the project to go ahead through assistance with planning, licensing and other statutory procedures.
3. **Joint ventures.** Joint ventures involve projects where the entire costs cannot be recovered through charges on end-users. The government offers a part subsidy in order for the project to go ahead.

Potential advantages of PFI projects compared to the traditional methods of procuring public services include:

- Value for money: PFI projects, carried out by the private sector, deliver greater value for money and increased efficiency compared to similar projects financed with traditional methods.

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- ❑ Transfer of risk: The private sector accepts a wider range of risks in the project. Many risks are transferred from the public to the private sector, including design, construction, financing, completion and operational risks.
  - ❑ Increased provision of infrastructure and services: PFI can provide additional facilities and infrastructures, which may not be in the public sector's planning.
  - ❑ Long-term view: PFI projects involve long-term relationships (15–30 years); hence, the public sector has to consider long-term view and interest rather than short-term capital funding.
  - ❑ Projects delivered on time and budget: PFI is believed to be more reliable in terms of delivery of projects and services on time and budget than the traditional procurement strategies.
  - ❑ Private sector innovations and expertise: With private sector involvement, projects gain benefits from private sector management skills and innovation, which lead to reduced project costs and increased efficiency.
  - ❑ Maintenance of assets: Under PFI, the private sector is responsible for maintenance and repairs of the asset over the asset life cycle, ensuring good maintenance.
  - ❑ Competition among service and asset private providers is achieved.
  - ❑ The public sector retains control.

Potential constraints and problems include the following:

- ❑ The formation of the borrower/special project vehicle (SPV) can sometimes be complex as the different stakeholders seek at differing objectives.
- ❑ The cost of finance is higher since the public sector can fund capital with lower financial costs.
- ❑ Agreements are brought about through complex negotiations.

Merna and Owen (1998) add that 'due to the complexity of concession contracts, the parties have to spend large amounts of money in advisory fees for lawyers and financiers'.

## 1.2 Financial assessment

Financial assessment is generally seen as a systematic approach to determining the commercial viability of a project to all those stakeholders involved in the project. In most cases the assessment will initially be carried out by the sponsors and if deemed commercially viable then assessed by a potential lender. What is not always apparent is how the use of finance is perceived by individual stakeholders, why a financial assessment is performed, who should be involved, where and when it should be performed, what data should be used and how financial assessments should be presented. The following briefly outlines the reasons.

### *What is financial assessment?*

For the purpose of this guide, financial assessment is defined as a structured, systematic approach, in a manner that clearly considers and presents a quantitative financial evaluation of the commercial viability of a project in terms of economic metrics that can be used in the decision-making process.

### *Why perform a financial assessment?*

The future income stream of a project is the most critical element in any project financing. The entire financing of a project is dependent on an assured income stream from that project since lenders and investors have recourse to no funds other than the income streams generated by the project, once it is completed, and assets of the project that may or may not have any residual value. The project sponsors, typically the SPV, therefore, need to demonstrate evidence of future income through various means such as a power sales contract for an IPP, a concession agreement for a toll road project allowing the collection of tolls, or tenant leases for a commercial real estate project (Tinsley 2000).

All stakeholders to a project utilising project finance seek to meet specified, often minimum returns in the form of a minimum acceptable rate of return for a given investment or a specified margin of profit.

Typically, lenders, shareholders and bondholders must consider the opportunity cost of finance for a number of projects to determine the acceptable return based on the risks perceived in a project. The size of risk perceived in a project determines the financial instruments to be used.

By engaging in a financial assessment process, all parties/stakeholders are made aware of the potential economic outcomes of the project for different scenarios of both financing instruments and the risks perceived. With a comprehensive picture of different financial scenarios, shareholders have a platform for decision-making. A financial assessment system can help to ensure that both the financial instruments considered for each scenario and their timing and the perceived risks are identified early and can be fully assessed in terms of viability, reducing the likelihood of costly mistakes.

### ***Who is involved in the risk assessment process?***

Financial assessment is typically performed by sponsors to determine such metrics as internal rate of return (IRR), net present value (NPV), payback period and cash lock-up for a particular project. In some cases the SPV will determine cover ratios and debt sculpting, dependent on the expertise available. Many projects will be rejected if such metrics are well below acceptable returns, and there is no scope for increasing the commercial viability through guarantees from third parties. Lenders will seek to determine cash flows for the worst case scenario based on estimates provided by the SPV for different finance packages. Coverage ratios will be computed to determine which finance package provides the most suitable solution to a specific project. A final detailed assessment will involve the SPV, lenders and financial, legal and technical experts.

### ***Where should a financial assessment be performed?***

Financial assessment should be performed by all stakeholders to a project before any finance is committed. Initially by the SPV and then

by lenders, shareholders and bondholders, the financial instruments of debt, equity and bonds should be considered. In PFI-type projects, it is also expected that financial assessments will be carried out by the public sector to determine budgets and acceptable unitary charges. As more information becomes available in terms of costs, revenues and their timings, more detailed assessment models can be developed and used in the decision-making process.

### ***When should a financial assessment be performed?***

Due to the relationship between finance and time, financial assessments should be performed on a continuous basis, considering not only the variations in costs of materials and resources but also the costs associated with raising and servicing different financial instruments. Typically, financial assessments are performed before finance or resources are sanctioned, thus providing the opportunity to change, shelve or abandon the project without incurring financial loss.

It should be emphasised that financial assessment is not a one-time occurrence. It must be done continuously to take into account market conditions and to monitor the project's performance over the project's life cycle.

### ***What data are to be used?***

Data can be sourced from many locations, both formal and informal. Typically, project finance is associated with four packages: (a) construction, (b) operation and maintenance, (c) cost of finance and (d) revenue generation. It is important that the data are used; typically, costs, revenues and their timings are accurately reflected in the relevant package. In the initial stages, many of the costs and timings will be estimates from previous similar projects. As an assessment progresses, data often become more accurate as costs can be fixed against detailed designs and required resources.

### ***How should assessment outputs be presented?***

The outputs of financial assessments should provide simple presentations on which decision-makers can base their decisions. In many

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organisations, presentations to decision-makers are too detailed and require too much time to interpret. The outputs suggested in this guide should be those that can be quickly interpreted by each stakeholder group such as cumulative cash flow diagrams, pie charts depicting different financing packages, tables indicating the economic parameters, such as IRR, NPV, cash lock-up, break-even points and coverage ratios associated with modelled scenarios. Risk assessments should be presented in terms of sensitivity and probability diagrams.

### **1.3 Purpose of this guide**

The purpose of this guide is to provide a structured assessment process for determining the commercial viability of a project procured utilising project finance. The guide is best used as an aide memoir to those involved or seeking involvement in the procurement of projects utilising project finance. The financial assessment structure is applied to a case study to determine the project's commercial viability. Readers can develop their own assessment structures as required using the assessment mechanism as a guide and the tables as templates for presenting the metrics used during the decision-making process.

### **1.4 Scope of the guide**

The guide does not provide detailed descriptions of financial instruments or provide all those risks associated with different types of projects. References for further reading are provided to cover the main elements of finance and risk associated with project financings.

Chapter 2 describes the characteristics of project finance and the parties and contracts typically involved in projects procured utilising project finance.

Chapter 3 identifies typical financial instruments used in the procurement of projects utilising project finance and describes how projects' cash flows are modelled to determine a project's economics.

Chapter 4 briefly outlines the risk assessment process through identification, analysis in terms of qualitative, semi-quantitative (deterministic) and quantitative (stochastic) and response to risks to determine the commercial viability of a project.

Chapter 5 provides a structured financial assessment process in the form of a flow chart, illustrating the type of assessment to be carried out at each stage of the process and the parties responsible for the assessment.

Chapter 6 provides the basic details of the case study. The estimated costs and revenues and their timings are illustrated for an IPP to be procured utilising project finance in China. A number of sale and offtake strategies are also described.

Chapter 7 provides the base case model assessment of the case study. Modelling projects through computer software can be an effective way of initially determining the cash flows of a project. Estimated costs and revenues can be input into a simulation model to determine the project's economic parameters. Typically, spreadsheet software is used at this stage of the assessment.

Chapter 8 provides a typical assessment performed by lenders seeking to determine the financial implications such as cash flow and coverage ratios associated with different financial packages in terms of debt, equity and bonds.

Chapter 9 describes a number of financial engineering techniques that can be used in project financings. A method for reappraising public-private partnership in terms of refinancing, restructuring and termination is described.

Chapter 10 describes how the final assessment of the case study is developed on the basis of the chosen financial package and the risks to be considered. This assessment uses stochastic analysis to determine the probability of the project meeting specified returns and a number of financial engineering techniques are considered to improve the project's economics.

Chapter 11 outlines the documentation and the legal considerations used in project financing and the major elements of the due diligence process, essential prior to the financial close of a project procured utilising project finance.

Chapter 12 provides a brief outline of Islamic finance and describes the principles, products and techniques associated with Islamic finance and its role in project financings.

Chapter 13 provides conclusions and recommendations on the financial assessment process and its application to different types of projects utilising project finance.