Principles of Project Finance

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List of Tables

List of Figures

Chapter 1

INTRODUCTION

Project finance is a method of raising long-term debt financing for major projects through 'financial engineering,' based on lending against the cash flow generated by the project alone; it depends on a detailed evaluation of a project's construction, operating and revenue risks, and their allocation between investors, lenders, and other parties through contractual and other arrangements. In 2012, at least $375 billion of investments in projects around the world were financed or refinanced using project-finance techniques.

'Project finance' is not the same thing as 'financing projects,' because projects may be financed in many different ways. Traditionally, large scale public-sector projects in developed countries were financed by public-sector debt; private-sector projects were financed by large companies raising corporate loans. In developing countries, projects were financed by the government borrowing from the international banking market, development-finance institutions such as the World Bank, or through export credits. These approaches have changed, however, as privatization, deregulation, and the introduction of private finance through public-private partnerships have changed the approach to financing investment in major infrastructure projects, transferring a significant share of the financing burden to the private sector.

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Unlike other methods of financing projects, project finance is a seamless web that affects all aspects of a project's development and contractual arrangements, and thus the finance cannot be dealt with in isolation. If a project uses project finance, not only the finance director and the lenders but also all those involved in the project (*e.g.* project developers, engineers, contractors, equipment suppliers, fuel suppliers, product offtakers, and—where project finance is used for public infrastructure—the public sector) need to have a basic understanding of how project finance works, and how their part of the project is linked to and affected by the project-finance structure. The nexus of contracts which make up a project cannot only be considered from a commercial perspective: a financial perspective is essential if much time and money is not to be wasted in creating projects which appear to work but cannot.

This book is therefore intended to provide a guide to the principles of project finance and to the practical issues that can cause the most difficulty in commercial and financial negotiations, based on the author's own experience both as a banker and as an independent advisor in project finance. The book can serve as a structured introduction for those who are new to the subject, and as an *aide mémoire* for those developing and negotiating project-finance transactions. No prior knowledge of the financial markets or financial terms is assumed or required.

'The devil is in the detail' is a favorite saying among project financiers, and a lot of detailed explanation is required for a book on project finance to be a practical guide rather than a generalized study or a vague summary of the subject. But with a systematic approach and an understanding of the principles that lie behind this detail, finding a way through the thickets becomes a less formidable task.

The subject of project finance is presented in this book in much the same way that a particular project is presented to the financing market (*cf.* §5.2.8), *i.e.*:

- *A general background on the project finance market and the rôles of the main participants:*
  - Chapter 2 explains how project finance developed, its key characteristics and how these differ from other types of finance, and why project finance is used.
  - Chapter 3 explains how investors develop projects, as well as the process for procuring public-sector projects using project finance.
  - Chapter 4 provides information on the markets for raising private-sector project finance debt.
  - Chapter 5 sets out the procedures for raising finance from private-sector lenders.
- *A review of the commercial contracts that can form a framework for raising project finance:*
  - Chapter 6 reviews the different characteristics of the main types of Project Agreements, which play a central rôle in many project-finance structures.

  - Chapter 7 looks at terms and conditions which are common to most Project Agreements.
  - Chapter 8 deals with the Sub-Contracts, which form a key part of a typical project-finance structure—including those for construction, operation and maintenance of the project, provision of fuel, raw materials and other input supplies, and insurance.
- *An explanation of project-finance risk analysis:*
  - Chapter 9 explains how lenders analyze and mitigate the commercial risks inherent in a project.
  - Chapter 10 similarly examines the effect of macroeconomic risks (inflation, and interest rate and exchange—rate movements) on project financing and how these risks are mitigated.
  - Chapter 11 analyzes regulatory and political risks and how these may affect a project.
- *A description of a project's financial structuring and documentation:*
  - Chapter 12 explains how the basic financial structure for a project is created.
  - Chapter 13 summarizes the inputs used for a financial model of a project and how the model's results are used by investors and lenders.
  - Chapter 14 sets out what lenders usually require when negotiating a project-finance loan.
- *Types of external support for projects:*
  - Chapter 15 explains how the public sector may provide financial support as part of the financing structure.
  - Chapter 16 reviews the rôles of development-finance institutions and export-credit agencies.

Finally Chapter 17 reviews recent market developments, new financing models and the future prospects for project finance.

Technical terms used in this book that are mainly peculiar to project finance are capitalized, and briefly explained in the Glossary, with cross-references to the sections in the main text where fuller explanations can be found; other specialized financial terms are also explained and cross-referenced in the Glossary, as are the various abbreviations.

Spreadsheets with the detailed calculations on which various tables in this book are based can be downloaded from www.yescombe.com.

References to books and articles are intended to provide some further reading for those interested in a particular topic, rather than as authorities for statements in this book, so they do not purport to provide a full bibliography. The main focus in these references is on those which can—at the time of writing—be freely downloaded from the internet (marked with an *). Again links to these and other similar resources are maintained at www.yescombe.com.

Chapter 2

WHAT IS PROJECT FINANCE?

§2.1 INTRODUCTION

This chapter reviews the basic features of project finance (§2.2), the factors behind its development (§2.3) and the 'building blocks' of a project-finance structure (§2.4), with examples (§2.5).

The benefits of using project finance are then considered from the point of view of the various project participants (§2.6).

§2.2 DEFINITION AND BASIC CHARACTERISTICS

Project-finance structures differ between various industry sectors and from deal to deal, since each project has its own unique characteristics. But there are common principles underlying the project-finance approach.

The Export-Import Bank of the United States (*cf.* §16.4.4) defines project finance as:

> *"…the financing of projects that are dependent on project cash flows for repayment, as defined by the contractual relationships within each project. By their very nature, these types of projects rely on a large number of*

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integrated contractual arrangements for successful completion and operation. The contractual relationships must be balanced with risks distributed to those parties best able to undertake them, and should reflect a fair allocation of risk and reward. All project contracts must fit together seamlessly to allocate risks in a manner which ensures the financial viability and success of the project."[1]

The rating agency Standard & Poor's (*cf.* §5.3.1) defines it as:

"…non-recourse financing of a single asset or portfolio of assets where the lenders can look only to those specific assets to generate the flow needed to service its fixed obligations, chief of which are interest payments and repayments of principal. Lenders' security and collateral is usually solely the project's contracts and physical assets. Lenders typically do not have recourse to the project's owner, and often, through the project's legal structure, project lenders are shielded from a project owner's financial troubles.

Project-finance transactions typically are comprised of a group of agreements and contracts between lenders, project sponsors, and other interested parties who combine to create a form of business organization that will issue a finite amount of debt on inception, and will operate in a focused line of business over a finite period."[2]

An 'official' definition of project finance was provided by the Basel Committee on Banking Supervision in the context of the 'Basel II' rules (*cf.* §17.3):

"Project finance is a method of funding in which the lender looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure. This type of financing is usually for large, complex and expensive installations that might include, for example, power plants, chemical processing plants, mines, transportation infrastructure, environment, and telecommunications infrastructure. Project finance may take the form of financing of the construction of a new capital installation, or refinancing of an existing installation, with or without improvements. In such transactions, the lender is usually paid solely or almost exclusively out of the money generated by the contracts for the facility's output, such as the electricity sold by a power plant. The borrower is usually an SPE (Special Purpose Entity) that is not permitted to perform any function other than developing, owning, and operating the installation. The

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[1] www.exim.gov – Home > Products > Loan Guarantee > Project & Structured Finance > Our Approach to Project Finance*.

[2] *Updated Project Finance Summary Debt Rating Criteria* (Standard & Poor's, New York, 2007)*.

consequence is that repayment depends primarily on the project's cash flow and on the collateral value of the project's assets."[3]

The Organization for Economic Cooperation and Development (OECD) provides another 'official' definition of project finance in the context of the Export-Credit Consensus (*cf.* §16.2.3):

"a) *The financing of a particular economic unit in which a lender is satisfied to consider the cash flows 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.*
b) *Financing of export transactions with an independent (legally and economically) project company, e.g. special purpose company, in respect of investment projects generating their own revenues.*
c) *Appropriate risk-sharing among the partners of the project, e.g. private or creditworthy public shareholders, exporters, creditors, offtakers, including adequate equity.*
d) *Project cash flow sufficient during the entire repayment period to cover operating costs and debt service for outside funds.*
e) *Priority deduction from project revenues of operating costs and debt service.*
f) *A non-sovereign buyer/borrower with no sovereign repayment guarantee (not including performance guarantees, e.g. offtake arrangements).*
g) *Asset-based securities for proceeds/assets of the project, e.g. assignments, pledges, proceed accounts;*
h) *Limited or no recourse to the sponsors of the private sector shareholders/sponsors of the project after completion."*[4]

So the principles of project finance can be summarized as:

- The project usually relates to major infrastructure with a long construction period and long operating life.
  - So the financing must also be for a long term (typically 15–25 years).
- Lenders rely on the future cash flow projected to be generated by the project to pay their interest and fees, and repay their debt.
  - Therefore the project must be 'ring-fenced' (*i.e.* legally and economically self-contained).

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[3] Basel Committee on Banking Supervision, *International Convergence of Capital Measurement and Capital Standards—A Revised Framework* (Bank for International Settlements, Basel, 2005), p. 49*.

[4] Organization for Economic Co-operation and Development, *Arrangement on Officially Supported Export Credits* v. TAD/PG(2013)1 (OECD, Paris, 2013), Annex X: 'Terms and Conditions Applicable To Project Finance Transactions', Appendix 1: 'Eligibility Criteria for Project Finance Transactions", I.: Basic Criteria*.

  - So the project is usually carried out through a special-purpose legal entity (usually a limited company) whose only business is the project (the 'Project Company').
- There is a high ratio of debt to equity ('leverage' or 'gearing')—roughly speaking, project finance debt may cover 70–90% of the capital cost of a project.
  - The effect of this high leverage is to reduce the blended cost of debt and equity, and hence the overall financing cost of the project.
- The Project Company's physical assets are likely to be worth much less than the debt if they are sold off after a default on the financing—and in projects involving public infrastructure they cannot be sold anyway.
  - So the main security for lenders is the Project Company's contracts, licenses, or other rights, which are the source of its cash flow.
  - Therefore lenders carry out a detailed analysis of the project's risks, and how these are allocated between the various parties through these contracts.
- The project has a finite life, based on such factors as the length of the contracts or licenses, or reserves of natural resources.
  - So the project-finance debt must be fully repaid by the end of the project's life.
- There are no guarantees from the investors in the Project Company for the project-finance debt.
  - So this is 'non-recourse' finance.[5]

Hence project finance differs from corporate finance, where loans:

- are primarily lent against a company's balance sheet and financial projections extrapolated from its past cash flow and profit record;
- has access to the whole cash flow from the spread of the borrower's business as security, instead of the limited cash flow from a specific project—thus even if an individual project fails, corporate lenders can still reasonably expect to be repaid;
- assume that the company will remain in business for an indefinite period and so can keep renewing (rolling over) its loans, which therefore do not need to be lent on a long-term basis; and
- may also be secured on the company's physical assets—its offices, factories, *etc*., so that if the debt is not repaid these assets can be sold off to help recover the debt.

[5] Or there may be limited investor guarantees, in which case this is 'limited-recourse' finance—(*cf.* §9.13).

§2.3 DEVELOPMENT OF PROJECT FINANCE

Project finance has long been used in the natural-resources sector, lending against the cash flow which will be produced by extracting resources: *e.g.* in the 1880s the French bank Crédit Lyonnais provided finance in this way for the development of the Baku oil fields in Russia.[6] Lending techniques were developed further in the Texas oil fields in the 1930s. Such natural resources-based project finance was given a considerable boost from the 1970s by oil price increases—in particular it played a key rôle in the early development of the North Sea oil fields, as well as gas and other natural resources projects in Australia and various developing countries. The commodities boom of the 2000s saw another revival of such financing.

Similarly, project finance for public infrastructure projects is not a new concept: *e.g.* the English road system was renewed in the 18th and early 19th centuries using private-sector funding based on toll revenues; the railway, water, sewage, gas, electricity, and telephone industries were developed around the world in the 19th and early 20th centuries with private-sector investment debt raised through bond issues.[7] During the first half of the 20th century the state took over such activities in many countries, but this process began to reverse in the 1980s. Similarly, in developing countries, expropriations of foreign investments in the 1950s and 1960s caused foreign private-sector investment in key sectors such as infrastructure and natural resources to fade away, but this process also began to reverse in the 1980s.

The worldwide process of deregulation and privatization of utilities, and the use of private finance for public infrastructure in cases where privatization is not possible or desirable, have been key factors in the growth of project finance over since the 1980s. Project finance, as an appropriate method of long-term financing for capital-intensive projects where the investment financed has a relatively predictable cash flow, has played an important part in providing the funding required for this change, and its modern development and structuring really results from this. This has taken place both in the developed world as well as developing countries. It has also been promoted by the internationalization of investment in major infrastructure projects: leading project developers now run worldwide portfolios and are able to apply the lessons learned from one country to projects in another, as are their banks and financial advisors. Governments and the public sector generally also benefit from these exchanges of experience.

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[6] Daniel Yergin, *The Prize* (Simon & Schuster, New York, 1991), p. 60.

[7] *Cf.* Barry Eichengreen, *Financing Infrastructure in Developing Countries: Lessons from the Railway Age* (World Bank Policy Research Working Paper 1379, Washington DC, 1994)*; Charles D. Jacobson & Joel A. Tarr. *Ownership and Financing of Infrastructure: Historical Perspectives.* (Policy Research Working Paper 1466, World Bank, Washington DC, 1995.)*

This modern development can be seen in successive 'waves':

- Project finance for natural resources projects was developed from the 1970s as discussed above.
- Project finance for independent power producers ('IPPs') in the electricity sector was first developed after the Private Utility Regulatory Policies Act ('PURPA') in the United States in 1978, which encouraged the development of cogeneration plants by allowing them to sell power based on long-term contracts priced at the marginal cost of the regulated utilities. The project-finance techniques developed for this purpose began to be used for power projects in developing countries such as Philippines and Chile in the 1980s, reached Europe with electricity privatization in the United Kingdom in the early 1990s, and then spread rapidly elsewhere in the world. In recent years project finance has also been widely used in the renewable power sector (*e.g.* wind- and solar-power generation).
- Project finance for other economic infrastructure (especially transportation) began in the mid-1980s with the first great modern privately-financed infrastructure project—the Channel Tunnel between Britain and France (signed in 1987), followed by two other major toll-bridge projects in Britain, along with privately-financed toll-road concession programs such as Australia's from the late 1980s and Chile's from the early 1990s.
- Project finance for social infrastructure (schools, hospitals, prisons, public housing, other public buildings such as government offices or police stations, *etc.*) was first developed through Britain's Private Finance Initiative ('PFI') from the early 1990s; PFI has been widely imitated elsewhere in the world.
- Project finance for the explosive worldwide growth in mobile telephone networks developed in the mid-late 1990s, but is no longer as significant.

Other changes in financing techniques, developed in the early 1970s, which helped the evolution of project finance included:

- *Long-term commercial-bank lending* to corporate customers—previously commercial banks only lent on a short-term basis, to match their deposits (*cf.* §10.3);
- The use of *export credits* for financing major projects (*cf.* §16.2);
- *Shipping finance*, where banks make loans to pay for construction of large vessels, on the security of long-term charters—*i.e.* construction lending against a contractual cash flow, with the borrower being a separate special-purpose company owning the ship, in a way very similar to later project-finance structures;

- *Real-estate finance*, again involving loans for construction secured against long-term cash-flow (rental) projections;
- *Tax-based financial leasing*, which accustomed banks to complex cash-flows (*cf.* §4.5.2).

The final vital element in the development of project finance was the creation (in the mid-1980s) of user-friendly *spreadsheet software*, without which project finance would be practically impossible.

Table 2.1 provides an analysis by industry sectors of the project-finance loan commitments provided by private-sector lenders in recent years. The effect of the global financial crisis after 2008 can be clearly seen, but as can also be seen the market recovered relatively strongly from 2010. (For a fuller analysis on a geographical basis, *cf.* §4.2.1.) Power generation has consistently been the most important market sector, although the figures in Table 2.1 do not show the sharp drop from $65 billion of lending in the power sector in 2001 to $25 billion in 2002, a product of the Enron débâcle and its knock-on effects elsewhere in the power industry. Infrastructure, especially transportation, has shown a remarkable growth during the 2000s, as has natural resources. Conversely, the decline in telecommunications from the boom years can be clearly seen.

These statistics do not include:

- direct lending (or lending through project-finance debt funds) by non-bank private-sector lenders (*cf.* §4.4; §17.4);
- public-sector finance for projects (*cf.* Chapter 15);
- finance from export-credit guarantors, insurers or banks, generally known as export-credit agencies ('ECAs'), and bilateral or multilateral development-finance institutions ('DFIs'), for which *cf.* Chapter 16.

Roughly speaking, if these other sources are added onto the figures in Table 2.1, the total project-finance debt raised in 2012 would exceed $300 billion. Assuming that debt averages 80% of total project costs, on the basis of this estimate some $375 billion of new investments worldwide were financed or refinanced (*cf.* §14.16.1—these figures include refinancings) using project finance in 2012.

It should be noted, however, that because it is debatable whether certain structured-finance loans should be classified as project finance or not (*cf.* §5.2.2), and the borderline between project finance and financing projects is not always clear (*cf.* Chapter 1), market statistics compiled by different sources can vary considerably.[8]

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[8] For example, the Dealogic database recorded $358 billion of project finance investments (*i.e.* debt plus equity) in 2011 and $406 billion in 2012. The classification of reported loans into different market sectors is also rather unclear in both the *Project Finance International* and Dealogic figures.