

Chapter 3

Evaluating the project

The offering memorandum

As a first step in the syndications sales cycle, the agent bank together with the project sponsors will prepare an offering memorandum (also known as an information memorandum). This occurs in the early phases of the loan syndication, as depicted in the syndication timeline shown in Figure 3.1.

Here, we look at the information memorandum as a sales/information tool. Most potential participants in a syndicated loan are expected to exercise prudent credit judgement by undertaking their own credit analysis. The process of credit analysis does not concern us here, we only note that there is a standard approach to assessing lending risks which typically includes obtaining information such as certificates of incorporation, authorized signatories, annual reports, auditor's certificates, etc. In the case of syndicated loans, the agent typically obtains this information from the borrower.

In any project finance transaction there are elements that fall outside the scope of traditional frameworks and checklists. This is particularly the case in transactions of a unique nature such as aircraft leasing or project financing. This could include information to supplement the traditional sources of credit information such as maps of the oil fields in question, estimated demand for oil, forecasted oil prices and various tables quantifying this. In other words, information relating to the specifics of the project being financed as opposed to the borrower's financial condition.

The purpose of the memorandum is to explain the project to potential lenders, including topics such as: experience of the project sponsors;

SYNDICATIONS TIMETABLE – FROM MANDATE TO DRAWDOWN								
Phase	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Mandate awarded	█							
Prepare first draft of facility agreement with legal counsel	█	█						
Prepare information memorandum	█	█	█					
Allocate participations and send invitations to banks	█							
Review/refine first draft of facility agreement		█						
Second draft of facility agreement from counsel		█	█					
Send invitations and letters of confidentiality to banks			█					
Send information memorandum and loan documents to banks			█	█				
Wait for banks to obtain individual credit approvals			█	█	█			
Negotiate facility agreement from borrower			█	█				
Sign draft facility agreement with borrower				█	█			
Wait for banks to review facility agreement						█		
Collect loan administration details						█	█	
Make final allocations							█	
Arrange signing ceremony						█	█	
Signing closing								█
Transfer syndications file to facility agent								█
Satisfy conditions precedent								█
DRAWDOWN								█

Figure 3.1 Syndications timetable

the identity and experience of the project participants (contractor, operator, suppliers and off-take purchasers); information on the host government; summaries of the project contracts; project risks, and how the risks are addressed; proposed financing terms; the construction budget; financial projections; and financial information about the project sponsors and other project participants. The purpose of the memorandum is to sell the loan – to help ‘the participating banks reach a credit decision, especially small banks that do not have seasoned credit analysts’.

Every professionally produced information memorandum has a disclaimer, or, more discreetly, ‘important notice’ as its first item. This disclaimer typically states with solemnity that ‘the document is not intended to provide the sole basis for any credit or other evaluation, is meant to inform, and is not a recommendation to buy’. This seems to suggest that no value can be placed on its content.

To put matters in perspective, the ‘information memorandum’ in effect is a marketing document, despite the presence of these disclaimers. The presence of these disclaimers can be traced back to lawsuits where certain lenders sued an arranger for alleged misrepresentation of the borrower’s financial condition as depicted in the information memorandum. The case was settled out of court with the agent bank repaying each of the lenders in full. Disclaimers have since been incorporated as standard operating procedure. Information memoranda nevertheless do not absolve the participating bank of undertaking its own independent analysis and exercising prudent credit judgement.

Legislation relating to information memoranda

Typically, information memoranda are released to potential lenders following the signing of a confidentiality agreement and letter of authority from the borrower authorizing the agent to release the information memorandum.

The information memorandum is a formal and confidential document prepared by the agent bank in conjunction with the borrower. The arranger

uses information provided by the borrower plus other official and unofficial sources, and the memorandum should ideally address all the principal credit issues relating to the borrower and more specifically the project being financed. The information memorandum is the most important document in the syndications process since it acts as a marketing tool as well as a source of information.

Information memoranda are typically prepared by the agent and borrower, and a disclaimer, usually in block letters on the cover, will state that the circular is 'for information purposes only' and 'not a recommendation to participate'. This is a document fraught with dangers for the lead bank in terms of the potential liabilities flowing from it and it is ironic that many lead banks only rarely take legal advice when preparing it.

There are two major sources of liability in relation to the soliciting of syndicate members by way of the information memorandum:

- The first is any relevant prospectus legislation in the countries in which it is distributed (e.g. the Companies Act 1985 and the Financial Services Act 1986).
- The second is misrepresentation should the statements in the information memorandum be incorrect or incomplete.

It is strongly recommended that agent banks preparing information memoranda seek the proper legal counsel in order to ensure that they are not exposing themselves legally by preparing and furnishing such a document.

It should be noted that while the arranging bank can expose itself legally by preparing and distributing an information memorandum, the arranger takes no responsibility for the completeness or accuracy of the information provided in the memorandum, and that providing an information memorandum does not disengage participating banks from the responsibility of undertaking their own independent analysis. It is up to the banks to evaluate the economic and financial aspects of a transaction before entering into a commitment.

Many jurisdictions have introduced legislation regulating prospectuses inviting public subscription for securities. Generally it may be said that if the information memorandum is to be within the legislation then:

- It may have to contain prescribed information.
- It may have to be registered (e.g. with a securities commission, a registrar of companies, or some other authority).
- The liabilities for misrepresentation may be more onerous.

Almost always, however, the information memorandum will fall within an exemption depending upon the circumstances. The principal ones are:

- The syndication constitutes a private offering and not a public invitation.
- The information memorandum is issued only to sophisticated 'investors' who can look after themselves.
- The borrower is a government or government body.
- The participations do not constitute 'securities' or 'debentures' within the relevant legislation.
- The information memorandum is issued only to foreign residents of foreign nationals.

However, we need to consider UK legislation in greater detail because one cannot assume that the syndication will benefit from an exception. The Companies Act 1985/New Legislation 1995, has this to say about the contents of the information memorandum:

The Companies Act 1985 requires the inclusion of specified information in a prospectus or circular offering to the public, for subscription or purchase, debentures of a company, whether domestic or foreign. The Act applies to any person who issues such a prospectus or circular in the UK regardless of his nationality.

As far as the information memorandum is concerned, the important words are 'debentures' and 'public'. Thus, if there is no 'debenture' (i.e. a document evidencing a debt), the information memorandum will escape and if the information memorandum is not distributed to the 'public', it will escape. Moreover, if the borrower is a foreign company,

then an information memorandum issued to professional dealers in securities will also be exempt.

The relevant provisions of the 1985 Act are to be superseded by new legislation from the Council of the European Communities numbered 89/298/EEC.

The typical information memorandum includes:

- **Disclaimer** It is important that it be clearly and prominently displayed.
- **Authority letter** Here the borrower authorizes release of the information memorandum to the syndicate.
- **Project overview** A brief description of the proposed project is included first in the memorandum. The overview includes the type of project, background on the host country, the status of development and other significant information.
- **Borrower** The description of the borrower explains the form of organization (corporation, partnership, limited liability company) and place of organization of the borrower. It includes the ownership structure of the borrower.
- **Project sponsors** The identity, role and involvement of the project sponsors in the project is included. Summary financial information about the sponsors is also given. This section also specifies the management structure of the project company.
- **Debt amount/uses of proceeds** How much debt the project will need is described generally in this section. Also included is the currency in which the loan is to be made and repaid. The manner in which loan proceeds will be used is an important part of the memorandum.
- **Sources of debt and equity** The total construction budget and working capital needs of the project, including start-up pre-operation costs, are outlined in this section. Also, the sources of the funds needed for the project are explained, including debt and equity.
- **Collateral** This discussion includes the identity of collateral, whether the collateral is junior in lien priority to other debt, and any special collateral considerations.
- **Equity terms** The terms of the equity are more completely described in this section. Included are explanations of the type of equity investments;

when the equity will be contributed; how the equity will be funded, whether the commitment is absolute or subject to conditions, and if conditional, why it is conditional.

- **Cost overruns** The offering memorandum may set forth an explanation of how any cost overruns will be funded.
- **Sponsor guarantee/credit enhancement** Any other guarantees or credit enhancement that the project sponsors will provide are also described.
- **Debt amortization** This section describes the proposed debt repayment terms, including amortization schedules and dates for repayment of interest and principal. Mechanical elements such as minimum amounts of prepayments, advance notice of prepayments, may also be described (but are governed by the loan agreement).
- **Commitment, drawdown and cancellation of commitment** The mechanical provisions are typically included, although they are generally identical boilerplate clauses in standard loan contracts. These include minimum drawdown amounts, and timing and notice of drawdowns.
- **Interest rate** Typical interest rate options include a bank's prime (or reference) rate, being the rate typically offered to its best customers, LIBOR (London Interbank Offered Rate), Cayman (rates of banks with respect to Cayman Island branches), and HIBOR (Hong Kong Interbank Offered Rate). Rates can, of course, also be fixed.
- **Fees** The fees offered to the lenders, including structuring fees, closing fees, underwriting fees and commitment fees, are described. Amounts are usually left blank and resolved during negotiations.
- **Governing law** In this section the choice of law to govern the loan documents is listed. It is sometimes the law of the host country. However, that is not so in financings in developing countries, unless lenders in the host country provide all debt.
- **Lawyers, advisers and consultants** This section will identify the lawyers, advisers and consultants involved in the project; often a budget for legal fees is requested.

Information memorandum issues

Before any project can be 'sold' to commercial lenders, its feasibility – technical and economic – must be presented in a convincing and authoritative manner. This is done via the preparation of the information

memorandum which will cite opinions from technical experts, financial and legal advisers and a review of the project.

The purpose of the information memorandum is to sell the deal to other banks, and it does this by selectively providing technical, economic, contractual, governmental and market information on the proposed project. This report is used by the project sponsor to generate interest with potential lenders, government officials and potential equity investors.

In order to maximize the potential of generating interest different reports might be prepared for each of these audiences, as one would prepare different CVs for different employers. These information memoranda effectively pre-prepare the analytical grunt work for potential providers of capital. The information memorandum will include several specific sections.

- **General description** The feasibility study generally begins with an overview description of the project. The location is specified, usually including a map of the project site, and other ancillary details anyone with a computer can extract from the World Wide Web. The more statistical information one can compile on the country and economy, preferably from official sources such as the OECD, the more authoritative the feasibility study appears. Statistical data can come from sources such as rating agencies, the OECD, and the US Department of Commerce, which cover esoteria such as topography, weather, drainage, major landmarks, population density, access to transportation and housing, water and wastewater treatment facilities and other data. Data that threatens to obfuscate the analysis is conveniently ignored so that it does not interfere with the marketing of the transaction.
- **Project sponsors and project company** Ownership interests in the project company are specified in detail, as is management control. This includes the standard corporate-produced prose on the background and experience of the project sponsors. (The feasibility study will be selective in quoting various successful previous projects. Past embarrassments do not figure in this marketing exercise; the whole point is to impress potential investors with the vast and omniscient experience of the project sponsors, and their immaculate track record.)

- **Project participants** Participants such as the contractor, operator, fuel supplier, off-take purchaser, local and central governments etc. are obviously described in flattering terms. In addition, linkage of the participants to previous projects, stressing anything that is positive and ostensibly relevant, is made. Biographies, financial information, credit ratings and anything likely to impress investors is incorporated into the report. To the extent detailed financial information about the participants is available, such as securities filings, this information is also included, but no analytical judgements are offered since doing so might be construed as a recommendation to participate, which could be an awkward accusation to deal with should the deal experience difficulties.
- **Technical information** The technical information section of the feasibility study provides an overview description of the proposed project and also explains the technology and processes that will be used. Since banks save money by firing analysts, this technical information is designed to impress by volume and depth, as opposed to providing practical information for a decision. Moreover, most bankers are incapable of understanding this technical information, so the exercise is basically designed to reassure bank officers and credit committees and satisfy the legal requirements that the transaction was properly analysed. Accordingly, the more exhaustive and complete the information, the more impressive. The fact that much of this information may be have no direct cause and effect linkage is irrelevant, because the whole exercise is designed to impress, not inform, readers who are technically deficient.

One publication cites on its list of information esoteria such as fuel sources (try predicting the price of oil in three years' time); infrastructure transportation; utilities (availability); water (sources, quality, treatment, transportation); roads and railways, ports and docks (need, type); raw materials (sources and supply); local labour (availability and skills); subcontractors (availability, qualifications); construction and operation labour (training, housing needs); spare parts (availability, delivery time, on-site supply needs); and residue and other waste disposal (sites, transportation, liability). It is doubtful MI5 or the CIA, let alone a bank, could realistically provide reliable information on the above. Lengthy discussions which are maddeningly

unspecific may be included in the documentation. Indeed, reading the technical elements of an information memorandum 10 years later may reveal the document to be nothing more than an exercise in creative writing.

- **Economic information** Despite the fact that economists and governments cannot plan economic policy since they are typically at the service of ideologues, bankers want economic information in the feasibility study, so this information is included. Explanations of economic information relating to the construction, operating and financing expenses for the proposed project and an estimate of the investment return for the project sponsor will feature. These projections usually bear no link to reality (e.g. Eurotunnel, or some oil companies' estimated oil reserves), but that is not the point. The essential matter is to come up with a forecast that can be passed through a credit committee, so that the deal can be clinched.
- **Contracts** The information memorandum will include an analysis of the documentation and credit enhancement structure. Any particularities relating to the legal framework in the host country will be noted, typically via expert legal opinions. Agreements can include the development agreement, partnership agreement or joint venture agreement; the project management agreement; the construction contract; the operating agreement; any site leases or other real property contracts; fuel and raw material supply agreements; output sale agreements; waste disposal agreements; host country agreements; etc. Beyond general information about these contracts, each description generally contains schedules for negotiating the contracts, details on current negotiations, major issues not yet agreed upon and other similar details.
- **Project schedule** The time schedule for the development, construction and initial operation of the project should be included, with all important milestones noted. This includes the obtaining of relevant government approvals and permits.
- **Government** The host government is described in the study, together with information about the likelihood of its support for the project. This often is a meaningless PR exercise because unpleasant realities such as rigged elections, media censorship, torture, cronyism, or corrupt government officials siphoning off funds from similar projects into overseas bank accounts or asking for cash commissions will be omitted since this would offend the relevant government and be counterproductive

to the project. Therefore, such analysis typically is of a bland, inoffensive and uninformative nature included for sake of formality as opposed to any meaningful analysis. It is therefore up to the bankers to undertake their own independent research into underlying realities.

- Market** Naturally it is important to identify and quantify the market demand for the goods or services provided by the proposed project. Accordingly, analysis of the good and market information typically includes descriptions of possible users of the project's production and the financial viability of these uses. This adopts the classic financial analysis techniques of identifying risks such as Michael Porter's Risk Assessment model. Analysis will typically focus on comparing the cost of purchasing the off-take from the proposed project versus the costs from alternative, existing sources. Particular focus will be on governmental policies for the economy; sector organization and analysis, or plans for privatisation of government-owned companies in the same sector; and industry trends that might affect the market for the project's output. Likewise, if the output will be exported, analysis will focus on the specific geographic regions in which sales are feasible,

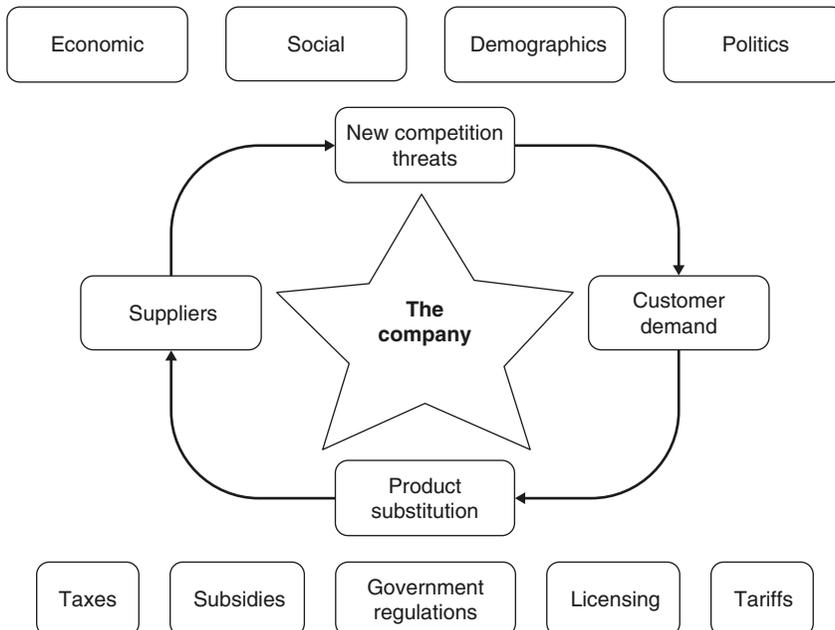


Figure 3.2 Porter's Risk Assessment Matrix

and legal, regulatory and financial constraints to export and import of the output.

- **Independent engineer** Since projects are technically complex endeavours, it is necessary to have specialists monitor the project to ensure that funds are not being skimmed off (for example, selling construction materials in the local bazaar), or that the project construction meets the technical criteria (e.g. proper safety, fireproofing, etc. is implemented). This is to avoid embarrassing incidents as well as the legal liability arising from events such as the collapse of the roof of the Charles de Gaulle Airport Terminal 2 in Paris or the oscillating Millennium Bridge in London. Also, success of the project depends on its ability to generate adequate cash flow to pay operating costs, service debt and generate equity return. Typically, these 'independent engineers' are specialists in a particular industry, and have large amounts of reports prepared on similar topics for past deals. The 'analysis' basically consists in recycling some past review of a similar project and updating it for the project in question. Obviously, the 'independent engineer' will conclude that the project is feasible (since to do otherwise would sink the deal and not result in future consulting business for the 'independent engineer'). The 'independent engineer's' report typically covers: engineering and design; construction; project start-up; operation and maintenance; input supply; off-take production; and financial projections. The report may also include analysis of local operating conditions; previous design vulnerabilities at similar projects; new technologies; the construction schedule and contractor incentives for timely project completion; operating budget contingencies; preventive maintenance plans; and suitability of assumptions in the financial projections.
- **Access to raw materials** If the project is dependent upon access to raw materials, the report will address these issues. For example, if a government grants a concession for the development of a mine, the project will also need access to domestic supplies for other strategic raw materials, such as oil or gas. In these cases, the government may agree to make the raw materials available to the project at a certain price. If access to critical raw materials is vulnerable, guarantees or insurance should be included wherever possible. In cases where access is not controlled by the government, there may be means to facilitate access such as by having the government waive or reduce the tariffs for such items.

- **Obtaining operating licences and permits** Operating licences and permits constitute the most valuable property of the project in the initial stage. Their availability is evidenced by documents of transfer signed by the highest level official in the government who is authorized to grant such licences and permits. In many countries, obtaining such permits is facilitated by the payment of cash commissions. It is often difficult to obtain receipts for the payment of such cash commissions. It is essential that these permits be transferable in order to maintain the on-sale value of the project. If the licences and permits are not transferable, then the owners of the project have in effect no market value for their assets (except perhaps for the salvage value of the equipment and raw materials). The availability and transferability issues will need to be specifically addressed in the bankable proposal and backed up by transfer of ownership documentation signed by the original owner.
- **Project profitability** The projection of costs and returns dictates the profitability and cash flow of the project. Financial projections should therefore factor in variables such as interest rates, exchange rates, inflation, taxes, delays and other contingencies. For a full description of the pro forma financial projections required for a project, one should use a developed spreadsheet model along the lines of the simplified model exhibited below in this chapter (see pp. 102–103).
- **Environmental legislation** Environmental compliance is becoming an increasingly important issue. It is essential therefore that the project comply with these directives. Whatever the requirements, the project owner needs to assure the bank that all such requirements will be fulfilled. Likewise, the bank may require, as a condition precedent, that the loan agreement becomes binding only after the successful completion of all the necessary environmental requirements. It is essential therefore that one obtains a legal opinion on the environmental legislation and requirements in effect in the host country.
- **Foreign exchange risk** Many countries still have currencies that are not freely convertible. This may pose a problem to the project's viability. For large projects, it may be necessary to have the government lift foreign exchange controls. For large projects, this may be necessary in order for the project to have any chance of success. However, for smaller projects this might not be a politically viable solution. In such cases, alternative

mechanisms may be necessary, such as barter agreements (oil for goods). Foreign exchange risk should not be underestimated since in the case of major currency movements, this can render dollar denominated projects excessively expensive to service with local currency revenues.

- **Project and country risk insurance** Insurance against project risks is critically important for the initiation of the project and insurance policies should therefore be made part of the bankable proposal since, without it, if the project is unable to pay back the loan, it may have to be written off as a complete loss. Moreover, given the currency crises witnessed during the 1990s, it appears that insurance against country risks would also be necessary in order to enable lenders to consider assuming the risks of a major project financing.
- **Financial appraisal of the project** Depending on who you are, there are several ways to evaluate whether a project is financially viable. For example, while international financial institutions prefer to use a discounted cash flow (DCF) model, companies are likely to use simple payback methods to calculate the costs and benefits of small-sized projects with short term completion horizons (within one to three years). Projects with longer payback periods however will typically rely on the DCF model.
- **Investment appraisal** The main method of calculating the viability of the project is the net present value (NPV) method of calculation. Project NPV of the investment project should be subjected to base case and sensitivity analysis accounting for different scenarios. There are four steps in calculating the value of a capital investment:
 - forecast the project's incremental (after-tax) cash flows;
 - assess the project's risk;
 - estimate the opportunity cost of capital (the expected rate of return offered to investors versus that of equivalent-risk investments traded in the capital markets);
 - calculate NPV using the discounted cash flow formula.
- **Calculating project costs** The first step in assessing the financial viability of a project finance proposal is to determine all the costs of the project. These can be categorized as follows:
 - **Capital costs and depreciation of the project** Capital costs include land, building, facilities, equipment and machinery, which are bought and paid for in one year and reside in the business for subsequent

years. The capital costs of the project will be accounted as an asset and depreciated over subsequent years.

- **Operating costs** These include direct costs of raw materials, labour and energy costs other than fuels and maintenance. Indirect costs such as storage, rates and rent, insurance and handling also apply. There are further general overhead costs due to administration and distribution activities. These should be well detailed.
- **Fixed vs. variable costs** Fixed costs are just that – costs that do not change with the output of the plant. These include: local tax, rent, rates, insurance, space heating and lighting. Variable costs vary in function of the output of the project, e.g. raw materials, manufacturing energy, fuel, equipment maintenance, packaging, labour, etc.

Cash flow

Cash flow represents the actual difference between money coming in and money going out of the investment project (Figure 3.3). Cash flows should

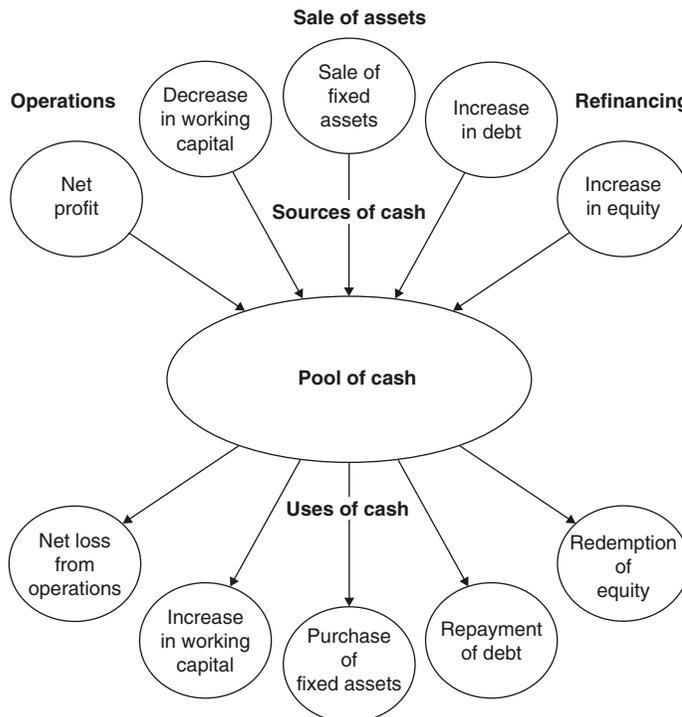


Figure 3.3 Sources and uses of cash

(£000s)	2000	2001	2002	2003	2004	2005	2006	2007
Gross revenues	0	0	360	1124	1304	1236	1150	712
Capital expenditures	540	780	80	0	0	0	0	0
Operating costs	0	0	124	132	148	164	180	196
Taxes	0	0	0	0	376	564	528	432
Cash flow before debt service	540	790	156	992	780	508	442	84
Drawdowns	460	664	0	0	0	0	0	0
Debt repayments	0	0	0	308	310	308	308	0
Interest payment	0	0	124	124	92	62	30	0
Cash flow to sponsor	80	116	32	560	378	138	104	84
Debt amortization								
Starting debt balance	0	480	1234	1234	926	618	308	0
Drawdowns	460	664	0	0	0	0	0	0
Principal repayment	0	0	0	308	310	308	308	0
Interest rolled over	20	90	0	0	0	0	0	0
Ending loan balance	480	1234	1234	926	616	308	0	0

Figure 3.4 Simplified project finance cash flow

Summary of cash flow model:

Gross revenue: The forecast level of income to as calculated by the project company (assumptions should be tested)

Capital expenditures

Operating costs: The capital costs and operating costs are estimates of what it will cost to build and run the project. Capital costs only apply during the building of the project. Operating costs, due to production increases and inflation increase steadily during the entire life of the project

Taxes: Taxes are calculated in function of any agreements and the tax environment in the country in question. It is important to explain how the tax rate is being calculated

Cash flow pre-debt service: This is line 1 minus lines 2, 3 and 4. This shows how much cash flow the company has before paying financing costs. Bankers typically like this cash flow figure to be at least 150% of financing costs

Drawdowns: This scenario assumes that 85% of the capital costs are financed by the banks in the first two years. Capital costs incurred in year 2 are financed from the project cash flows in year 1 of production

Debt (loan) repayment: The loan repayment schedule features 4 equal yearly instalments starting in year 3. Repayment schedules are the result of cash flow projections, project dynamics and negotiation and can vary considerably (see Table 3.1)

Interest repayment: The projections assume an interest rate of 10% per annum on the loan amount outstanding at the start of year 3. There is no interest in years 1 and 2 since no revenue is being generated and interest is therefore capitalized

Table 3.1 Loan repayment schedules

	1	2	3	4	5	6	7	8	Total
Straight line	125	125	125	125	125	125	125	125	1000
Variable	50	150	150	250	100	50	50	200	1000
Balloon	50	50	50	50	50	50	50	650	1000
Bullet	0	0	0	0	0	0	0	1000	1000

not be confused with accounting profits and losses. Consequently, the P/L statement needs to be adjusted in order to transform the investment project's (income statement) earnings into the project's cash flows. For example, depreciation charges have to be added as they do not correspond to a cash outflow at all, increases in assets (account receivables and inventories and borrowings) will have to be deducted and increases in liabilities (account payables, bank debt, equity) added back.

Financial ratios

Financial ratio analysis can take two forms:

- Historical ratio analysis: this looks at the company's performance over time.
- Peer group analysis: this compares the company's performance to other similar companies in similar industry sectors.

Figure 3.4 (continued)

Cash flow to sponsor: This is negative during the first two years because the sponsors are committing funds to the project. After year 2 the project produces a positive cash flow to the sponsors after debt service

Debt amortization

Starting loan balance: This shows the outstanding of the loan at the beginning of the year

Drawdowns

Principal repayment

Loan rolled over

End loan balance: This shows the outstanding of the loan at the end of the year

General financial ratios for various industries are published by the Risk Management Association (ex Robert Morris Associates), Dun & Bradstreet, BVD-Amadeus and various other credit agencies and trade associations.

Financial ratios can be divided into four types pertaining to:

- liquidity
- debt
- profitability
- covering ratios.

The first two types are ratios computed from the balance sheet; the last two are ratios computed from the income statement and, sometimes, from both the income statement and the balance sheet.

The table 3.2 depicts the main financial ratio categories for corporates.

We discuss certain ratios which are particularly relevant in project finance analysis, which looks to future cash flows as opposed to classic balance sheet ratios.

Liquidity ratios

Liquidity ratios are used to judge a firm's ability to meet short term obligations. The main ratio to measure liquidity is the current ratio.

$$\frac{\text{Current assets}}{\text{Current liabilities}}$$

The higher the ratio, the greater the ability of the firm to pay its bills. However, the ratio does not take into account the liquidity of the individual components of the current assets, such as inventory, receivables (stock, work in progress, debtors) etc.

Table 3.2 Financial ratio categories

Return On Equity	= net income before dividends/total net worth
Profitability	= net income before dividends/net sales
Efficiency	= net sales/total assets
Capital Structure	= total assets/total net worth
Efficiency Ratios	
Debtors Days	= trade debtors/net sales \times 365
Total Stocks Days	= raw materials + work in progress + finished goods/cost of goods sold \times 365
Raw Materials Days	= raw materials/cost of goods sold \times 365
Work In Progress Days	= work in progress/cost of goods sold \times 365
Finished Goods Days	= finished goods/cost of goods sold \times 365
Creditors Days	= trade creditors/cost of goods sold \times 365
Accruals Days	= accruals/cost of goods sold \times 365
Net Plant Turnover	= net sales/net fixed assets
Working Investment/Sales	= [(trade debtors + stocks) – (trade creditors + accruals)]/net sales
Financial Ratios	
Interest Cover	= operating profit/interest expense
Tangible Net Worth	= total net worth – intangibles
Working Capital	= total current assets – total current liabilities
Current Ratio	= total current assets/total current liabilities
Liquid Assets	= cash + short term investments + trade debtor + other debtors
Quick Ratio	= (liquid assets + prepayments)/total current liabilities
Gearing	= (total loans + std + cpltd)/total net worth
Leverage	= total liabilities/total net worth
Interest Cost	= interest expense/(total loans + std + cpltd)
Cash flow Ratios	
Cash flow Interest Cover	= operating profit/Interest expense
Financing Payments Cover	= operating profit/(Interest expense + cpltd + dividends)
Debt Service Ratio	= operating profit/(std + cpltd + interest expense)
Total Debt Payout	= total interest – bearing debt/operating profit
Long term Debt Payout	= total interest – bearing ltd/operating profit
std = short term debt; cpltd = current portion of long term debt; ltd = long term debt.	

The quick ratio is a more accurate guide to liquidity, and is as follows:

$$\frac{\text{Current assets less inventories}}{\text{Current liabilities}}$$

The quick ratio excludes inventories and concentrates on cash, marketable securities and receivables. It is a conservative ratio that is not vulnerable to asset shrinkage (the fact that inventory may fetch less than its accounting value in a bankruptcy) and thus provides a more reliable (albeit weaker) measure of liquidity than the current ratio. Reality probably lies somewhere in between the two.

Debt ratios

Debt ratios are used to measure the indebtedness of companies. Several debt ratios may be used. The debt-to-net worth ratio is computed by simply dividing the total debt of the firm (including current liabilities) by its net worth.

$$\frac{\text{Total debt}}{\text{Net worth}}$$

When intangible assets are significant, they frequently are deducted from net worth to obtain the tangible net worth of the firm, since the valuation of intangibles is often a subjective exercise.

Coverage ratios

Coverage ratios measure the ability of a company to generate cash flow in excess of its financing commitments. Credit rating agencies make extensive use of these ratios. One of the most traditional of the coverage ratios is the cash flow coverage ratio, which may be expressed as:

$$\frac{\text{Annual cash flow before interest and taxes}}{(\text{Interest} + \text{principal payments})}$$

Bankers typically like to see a cash flow coverage ratio at a minimum of 150%. This ratio can be further refined to take into account the tax implications on cash flow:

$$\frac{\text{Annual cash flow before interest and taxes}}{(\text{Interest} + \text{principal payments} [1/(1 - \text{income tax rate}))]}$$

This ratio adjusts for the fact that interest payments occur before taxes whilst principal payments occurs after tax by including $[1/(1 - \text{income tax rate})]$. In such cases, it is essential to know the tax rate in the jurisdiction in question. For example, if the tax rate is 34% and annual principal payments are €100 000, before-tax earnings of €151 515 would be needed to cover these payments.

Sensitivity analysis

In any project finance cash flow forecast, certain assumptions are made. It is therefore necessary for the banker to assess the effect of potential impacts on key variables of the model such as shortfalls in the project's production, changes in the product price, increases in operating costs, fluctuations in interest rates, etc. The purpose of this is to test the ability of the project's cash flows to weather the storms of volatility and unexpected developments and identify possible corrective avenues. This process is known as sensitivity analysis.

The spreadsheet in Figure 3.5 illustrates a basic sensitivity analysis model concerning the building of a housing development in a Middle Eastern country. In some instances the ability of the borrower to service debt may be particularly sensitive to changes in one particular variable. The lender needs to identify and be aware of which elements these are so that rapid corrective action can be undertaken in the event that these problems manifest themselves. This is why in most credit proposals 'standard' and 'downside' scenarios are prepared – the latter (e.g. Figure 3.6) effectively depicts what would happen to the borrower's ability to repay the loan should extremely pessimistic assumptions materialize.

The credit officers of the bank may request that the combined effects of these changes are shown in the form of one ratio which demonstrates

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Increase in house rent 9.0% ^a DSR 130% ^b Int. rate 6% ^d Equity 1500 ^e										
Increase in land rent 0.0% ^b Y1 Full rent 2340 ^b Y1 electr. 144 ^b										
Occupancy ^c	40%	95%	95%	95%	95%	95%	95%	95%	95%	95%
Full occupancy ^a	2340	2551	2780	3030	3303	3600	3924	4278	4663	5082
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Construction costs	-6657 ^b	-952 ^b								
Legal fees	-200 ^b									
Ground rent	-500 ^b	-500	-500	-500	-500	-500	-500	-500	-500	-500
Rental income ^c	936	2423	2641	2879	3138	3420	3728	4064	4429	4828
Net elec. receipts ^c	58	137	137	137	137	137	137	137	137	137
Net operating cash flow	-6363	1108	2278	2516	2775	3057	3365	3701	4066	4465
Equity capital	1500 ^e									
Loan	6800	1000	200							
NCF before finance	1937	2108	2478	2516	2775	3057	3365	3701	4066	4465
Loan outstanding	6800	7800	7200	6200	5200	4000	2000	0	0	0
Loan interest ^d		408	468	432	372	312	240	120	0	0
Loan			800	1000	1000	1200	2000	2000		0
Total fin. outflows	0	408	1268	1432	1372	1512	2240	2120	0	0
Net cash flow	1937	1700	1210	1084	1403	1545	1125	1581	4066	4465
Carryforward net	1937	3636	4846	5930	7333	8878	10003	11583	15650	20115
DS ratio		272%	180%	176%	202%	202%	150%	175%	NA	NA
DS ratio required		140%	140%	140%	140%	140%	140%	140%	140%	140%

Figure 3.5 Housing development cash flow sensitivity analysis model base case. Input variables are shown in the top rows, letters a–e show links between values entered in the spreadsheet

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Increase in house rent 6.0% ^a DSR 130% ^b Int. rate 8% ^d Equity 1000 ^e										
Increase in land rent 0.0% ^b Y1 Full rent 2340 ^b Y1 electr. 144										
Occupancy ^c	10%	80%	85%	85%	90%	90%	90%	90%	90%	90%
Full occupancy ^a	2340	2480	2629	2787	2954	3131	3319	3518	3730	3953
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Construction costs	-665 ^b	-95 ^b								
Legal fees	-200 ^b									
Ground rent	-500 ^b	-500	-500	-500	-500	-500	-500	-500	-500	-500
Rental income ^c	234	1984	2235	2369	2659	2818	2987	3167	3357	3558
Net elec. receipts ^c	14	115	122	122	130	130	130	130	130	130
Net operating cash flow	-7109	648	1857	1991	2288	2448	2617	2796	2986	3188
Equity capital	1000 ^e									
Loan	6800	1000	200							
NCF before finance	691	1648	2057	1991	2288	2448	2617	2796	2986	3188
Loan outstanding	6800	7800	7200	6200	5200	4000	2000	0	0	0
Loan interest ^d		544	624	576	496	416	320	160	0	0
Loan			800	1000	1000	1200	2000	2000		
Total fin. outflows	0	544	1424	1576	1496	1616	2320	2160	0	0
Net cash flow	691	1104	633	415	792	832	297	636	2986	3188
Carryforward net	691	1795	2428	2843	3636	4468	4765	5401	8387	11575
DS ratio		119%	130%	126%	153%	151%	113%	129%	NA	NA
DS ratio required		140%	140%	140%	140%	140%	140%	140%	140%	140%

Figure 3.6 Housing development cash flow sensitivity analysis model downside scenario. Input variables are shown in the top rows, letters a–e show links between values entered in the spreadsheet

the ability of the borrower to service debt. The debt cover ratio fulfils this function and is a concept which is explained in the following case study and next section.

Housing development cash flow sensitivity analysis

In the following case study, the base case projected cash flows concern a housing development project in the Middle East. The financial projections for the housing project are presented by the sponsor to the lead bank. You are asked to check whether the cash flow cover for interest payable and debt repayment each year is acceptable.

For the purposes of analysis, and to assist in re-structuring the finance package, the bank decides that a minimum figure of 1.40 should be set for the debt service ratio (DSR). Considering the riskiness of the project, this should be sufficient to maintain acceptable cover in the event of adverse variations in constructing costs and rental income.

Working within this constraint the lead bank comes up with the base case cash flow projection.

Your bank, however, wants to test the new package by adversely flexing some of the input variables – increases in house rent, occupancy rates, rental income, interest rates and an additional equity injection. You hence modify certain of the key variables in the ‘downside scenario’.

Accordingly, the model with the input variable zones enables various elements to be tested: for example

- house rents increase more slowly at 6% instead of say 9%;
- occupancy rates are lowered to 80–85–90% instead of 95%;
- interest rates rise from 6% to 8%;
- equity injections are lowered from 1500 to 1000.

In the spreadsheets in Figures 3.5 and 3.6 letters a–e denote direct associations between variables, with the input variables in the top rows.

The resulting effect on the cash flow is shown in the housing development cash flow sensitivity analysis downside scenario. This scenario is regarded as extremely pessimistic since multiple variables are tested simultaneously. This is normal since one can assume the agent bank is trying to sell the loan with optimistic projections.

We can see that the debt service ratio in the downside scenario dips below the mandated 1.4 but is still well above 1.0, thereby offering a margin of error.

An intelligently designed spreadsheet with the input variables concentrated in the upper zone as a 'dashboard' colour coded to the relevant areas in the spreadsheet enables quick testing of the impact that various input variables may have on the project cash flows. These can moreover be summarized in graphical form, as seen in Figures 3.7–3.10.

It is useful to consider the impact of changes in the input variables on the bank and on shareholders. This can help focus the inquiry for added security measures via covenants or guarantees.

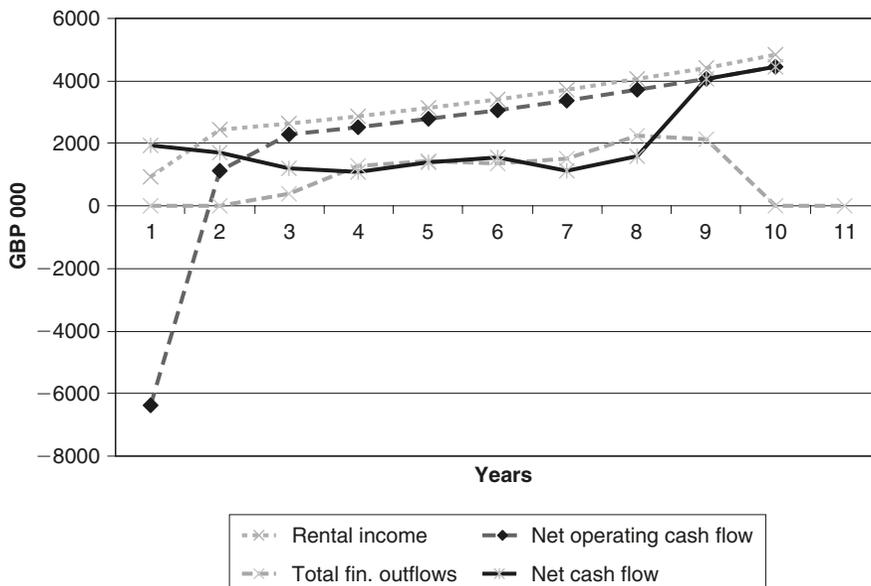


Figure 3.7 Housing project cash flow model: base case

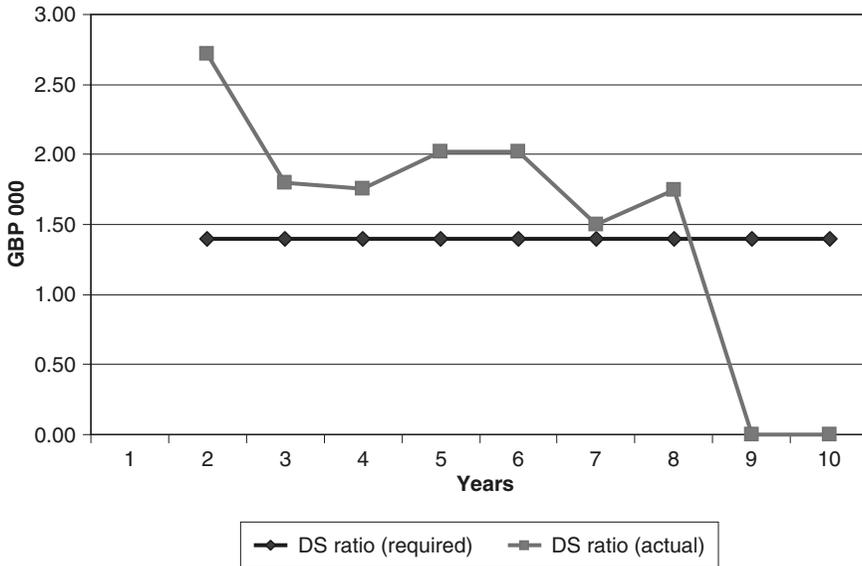


Figure 3.8 Housing project cash flow model: debt service ratio – base case

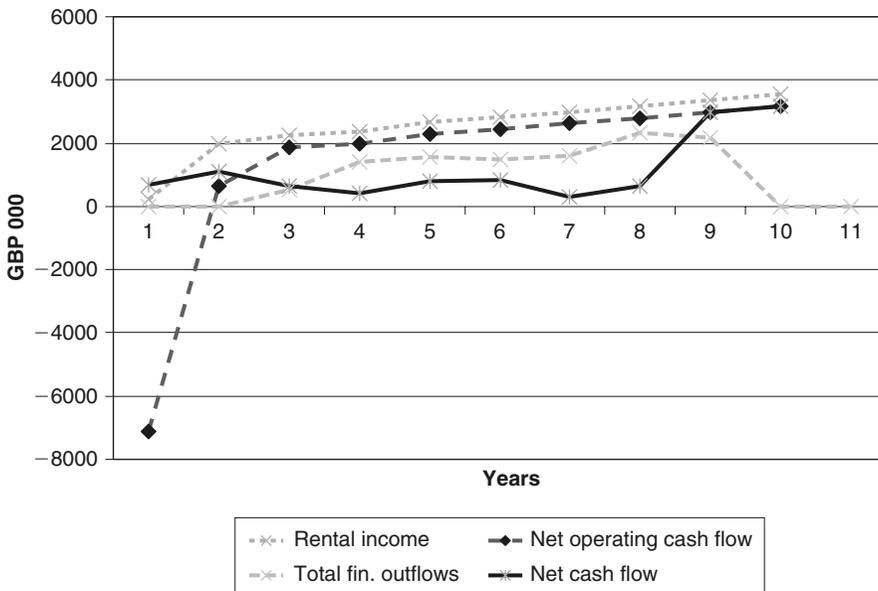


Figure 3.9 Housing project cash flow model: downside

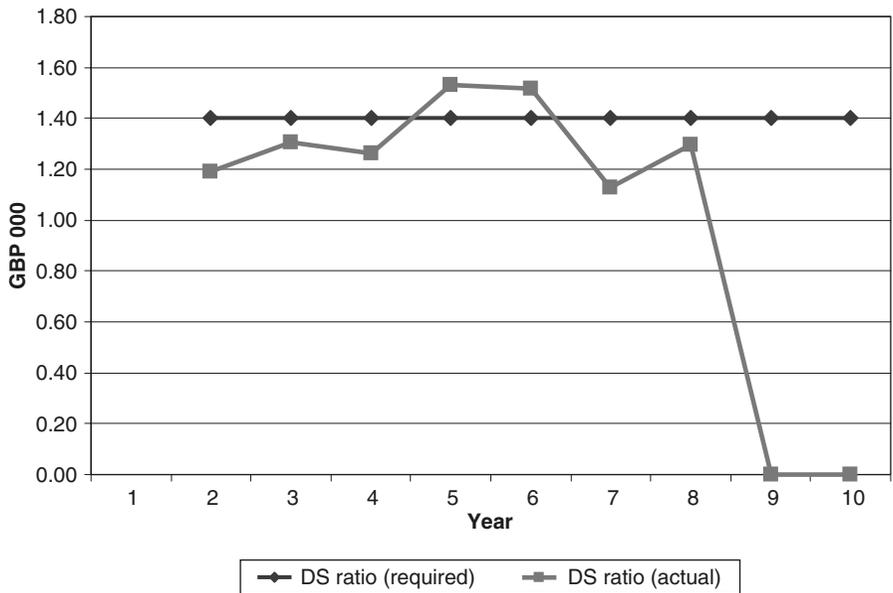


Figure 3.10 Housing project cash flow model: debt service ratio – downside

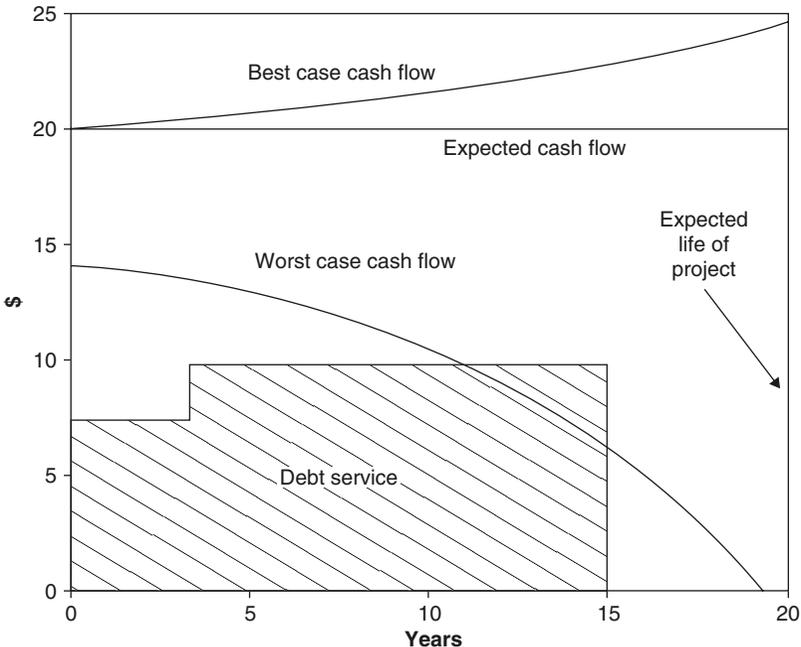


Figure 3.11 Comparison of expected cash flow, best case and worst case (constant dollars)

Credit risk appraisal: general considerations

Commercial lenders in a project financing supposedly conduct a detailed review and analysis of a proposed project before the decision to lend is made. While the intensity, scope and methodology of the credit analysis varies from institution to institution, there are general fundamentals that almost every bank applies to the credit decision. These are summarized below.

Pre-construction

- **Experience and reputation of project sponsor** The project sponsor's experience in similar projects is important to the lenders. Although each project presents unique risks, an industry reputation for project support and completion, 'on spec and on time', is evidence of a 'bankable' reputation.
- **Engineering and design** Lenders should assure themselves that any technology being used in the project is of a reliable and proven design, as evidenced by a solid track record of similar installations. Any potential weaknesses and successes in addressing those issues in other project financings should be noted. New technology, often for the sake of increased operating efficiency, should be carefully analysed for any potential weaknesses and this increased risk should be reflected in the facility pricing.
- **Construction** Even though a project's conceptual design may intend to limit the potential for construction difficulties, construction contracts that provide performance guarantees and warranties, as well as penalty and damage payments sufficient to ensure the project's acceptance within the established schedule and budget, are more acceptable to banks than projects that do not have such guarantees.

Post-construction

- **Operations and management** How an owner/operator plans to operate and maintain a facility during start-up and the early years of a project generally determines the long term performance of the facility.

Banks obviously prefer to see a management team with experience and a proven track record in management of the facility.

- **Experience and resources of operator** The entity operating the project, typically pursuant to a long term operating agreement, must possess sufficient experience and reputation to operate it at the levels necessary to generate cash flow at projected levels. It also needs to have the necessary financial solidity to support operating guarantees and other contractual obligations.
- **Price and supply of raw materials** The project must be assured of a supply of raw materials at a cost within the acceptable ranges of financial projections. This will depend on the availability of materials in the project area or need to source them from afar. Anything which can adversely impact this supply needs to be identified as a risk, and mitigated if possible.
- **Off-take contracts** Since off-take contracts are the main source of project revenue, the lender will be particularly interested in the contractual documentation governing such agreements. The lender will be particularly interested in the payments under the contract being adequate to pay operating costs, and service the debt.
- **Equity contributions** In many project financings, it is important to specify the contractual arrangements for the timing and certainty of the equity funding in order to optimally schedule the timing and dependability of the injection of funds into the project.
- **Value of project assets as collateral** The project lender should ensure that the contracts enable assets to be assignable, since if there is a foreclosure, the contracts will only have value if they can be taken over by the lender and then sold (assigned) to a future buyer.
- **Competitive market exposure** Given that most projects produce a generic commodity, low-cost production relative to the market is essential for an investment-grade rating. Indeed, experience has shown that off-take contracts providing stable revenues may not be enough to mitigate adverse market situations. Hence, market risk can potentially take on greater importance than the legal profile of, and security underlying, a project. The analysis of a project's competitive market position should therefore focus on factors such as industry fundamentals, commodity price risk, market outlook for demand and price, foreign exchange exposure and vulnerability to foreign devaluations,

and the ease or difficulty with which new competitors may enter the industry.

- **Counterparty exposure** Much of the project's strength derives from contractual participation of outside parties in the establishment and operation of the project structure. This participation raises questions about the strength or reliability of such participants. Traditionally, a project's credit strength is often linked to the credit strength of the off-take counterparty; this was especially the case for IPPs with power purchase agreements signed with a creditworthy entity, such as a utility. Important off-take counterparties to project now can include providers of LOCs and surety bonds, parties to interest rate and currency swaps, buyers and sellers of hedging agreements and other derivative products, marketing agents, political risk guarantors and government entities. Because projects have increasingly taken on complex structures, the failure of a counterparty can put a project's viability at risk. Accordingly, the analysis of counterparty risk not only becomes critical to a project's rating, it becomes more complicated. Whereas projects traditionally sold output to one buyer, projects may find that they have multiple buyers.

Financial strength

Overall project financial risks of course are larger than the risks measured by debt service coverage ratios. As we have seen, projects are subject to several varieties of financial threats over and above the ability of the project to generate stable and sufficient levels of cash flows. Negative impacts can arise from elements such as foreign exchange risks, inflation risks, liquidity risks and funding risks.

- **Financial risk** Financial risks can in part be addressed by hedging against foreign exchange and interest rate movements via interest rate swaps, interest rate caps, collars and floors, etc. Debt servicing can be impacted by factors such as market prices, inflation rates, energy costs, tax rates, etc., all of which impact the cash flow available for debt servicing commitments even if off-take agreements are in place. Certain of these risks can be protected via hedging facilities such as forward sales and futures and options contracts, but this will also increase the overall cost of funding.

- **Capitalization and financial flexibility** Project sponsors will generally try to structure highly leveraged transactions in order to limit their equity commitment. Fundamentally, the amount of leverage is irrelevant to the credit rating, since repayment is conditional upon the project's ability to generate cash sufficient to cover financing commitments. Low leverage however is often considered an indication of creditworthiness, and is therefore essential for raising investment-grade rated debt. Amortization schedules also often influences the rating – the sooner the money is paid, the less the financial commitments stretch out over time, thus reducing risk and improving the credit risk rating of the facility.
- **Inflation risk** Inflation, or the lack of inflation, can pose several risks; for example, projects whose contractual revenues are linked to inflation risk being weakened if inflation falls below inflation assumptions. Basically, in such cases, revenues will fail to grow by the anticipated (inflation) rate and generate lower than expected cash flows. Inflation can also pose a threat if the raw materials and inputs of the project are subject to price hikes. It is important to identify and analyse these vulnerabilities in order to mitigate the risks.
- **Interest rate risk** Most project financings generally remove interest rate risk by financing with fixed interest rate debt. However, this is not always the case and some project financings rely on a floating reference rate. Such projects risk an erosion of their credit strength if market reference rates increase and revenues cannot increase at the same rate to offset the increased costs. It is therefore important to factor in such elements in sensitivity analyses in order to establish the margin of flexibility.
- **Liquidity risk** Liquidity is essential in order to maintain operations. Creditworthy projects should demonstrate the ability to generate sufficient cash to fund ongoing activities and debt servicing. Some projects however may need to have a working capital facility in order to even out revenues subject to seasonal variations.