

RISK ASSESSMENT AND OPTIONS IN PROJECT FINANCE

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INTRODUCTION

Project finance is more than merely financing a project. It is about minimizing and mitigating risks. Project finance, a relatively new concept to the academic world, refers to the financing of construction/engineering ventures and facility renovations that the sponsoring company has segregated from its assets and general-purpose obligations. Project finance concerns complex financial and legal transactions involving a number of participants who, using debt and equity, aim to provide financial support while attempting to avoid various risks associated with an on-segregated project. Normally, a project segregated finance is the arrangement of debt, equity and credit enhancements for a capital-intensive facility-domestic or international [11]. There are, however, major differences between financing a project and project finance.

PROJECT FINANCE

In project finance, the lenders base their appraisal solely on the projected cash flow from the project operation, rather than on the general assets or the corporate credit of the promoter of the facility. Project finance is in contrast to term lending in which the lenders base their analysis of the loan on the historical earnings of the borrower and are satisfied with recourse to the collateral value of the borrower's assets securing the loan. It is also in contrast to internal financing. Being "insulated" from the rest of a parent's operations, project finance especially minimizes the parent's risk exposure. A few characteristics that readily distinguish project finance from standard finance are:

- The project's financing is separate from the operations of the project and relies heavily on debt and financial leverage (approximately 65 percent to 75 percent) for its capital needs.

- Borrowing is gauged by collateral and cash flow potential for the venture.
- The project depends on commitments of third parties (i.e., suppliers, governments, etc.) and the sponsor for credit support.
- The lender(s) does not receive the full guarantee from the sponsor that all risks will be borne in the initial agreement.
- Project debt is differentiated for balance sheet purposes so that the parent company will not have complete or direct obligations [18].

Not only are there differences in project finance and financing a project, but there are two distinct types of project finance: classical and pure project finance.

Classical vs. Pure Project Finance

Classical project finance influences the lenders to take every risk possible on an unestablished company or scheme for the sake of future cash flow. For classical project financiers, there is no recourse to the assets of the parent, except the project itself. Classical project finance depends largely on political will and funding [1]. In other words, if the government will sponsor the project and allocate the funding, the project can be financed more easily. In pure project finance, on the other hand, risks are evaluated against the "projected cash flows from an up-and-running enterprise, rather than against the creditworthiness of the borrower" [4].

The success rate of pure project finance is spotty. There are no guarantees that loans will be repaid. This is due in part to the dependence of loan service on product price, sales revenue and the generated cash flow. Without cash flow, loans and other debt cannot be repaid, leaving lenders "holding the bag." This is especially true for lenders and some borrowers in the developing world,

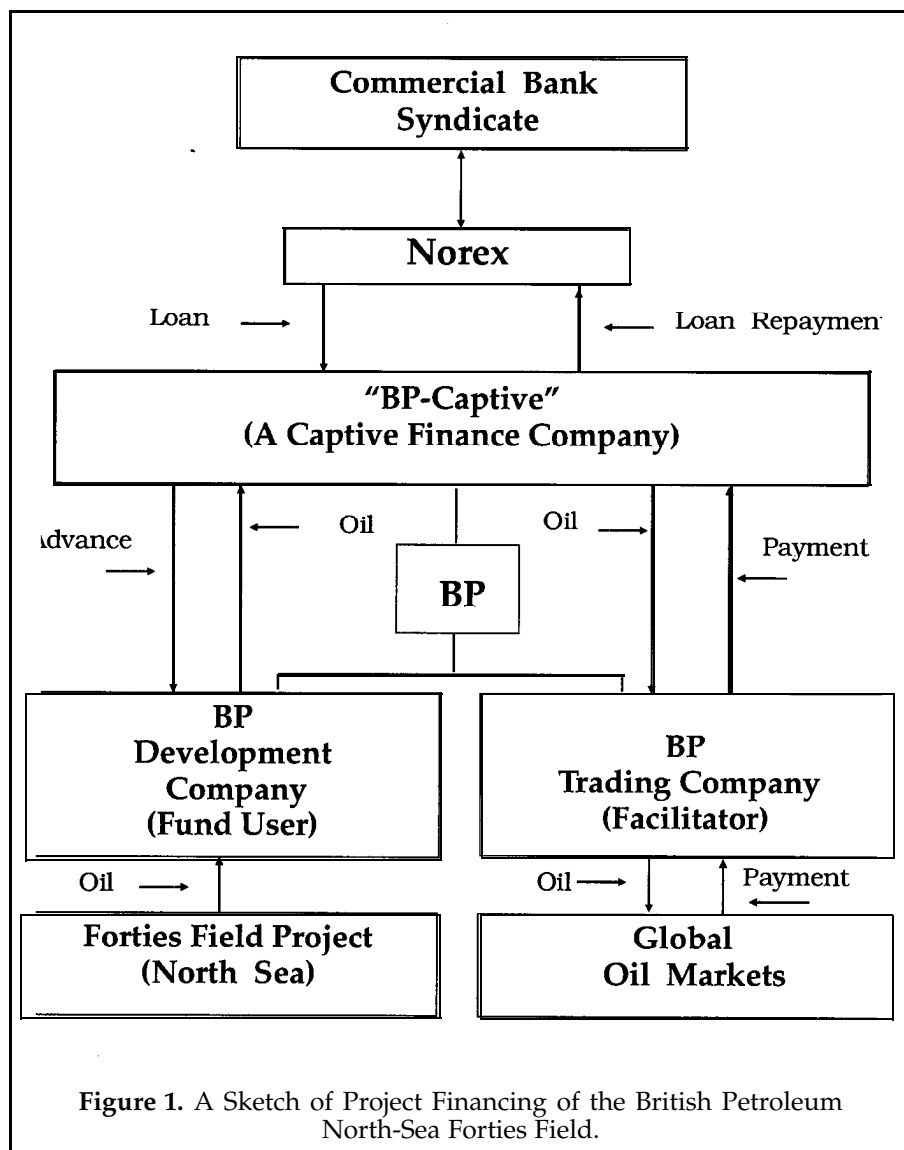
"nothing beats cash up front" [4]. Many pure project financiers find ways to make the customer pay, even if it is on a deferred basis. Although pure project finance runs the risk of delinquency, the failure rate is much lower than for standard types of financing projects.

MANAGING PROJECT FINANCE

Project finance is not a one person or a single group venture; many participants are involved in the financial success of the project. These include sponsors, construction lenders, permanent lenders, contractors, operators, technology owners, suppliers, and output purchasers. Each participant bears a different risk and performs at a different level. Simultaneously, experienced management personnel must be available to direct and operate the project throughout all its phases.

The **sponsor's** goals are to recover expenses during the development stages of the project and earn management or similar fees. The project sponsor looks for debt financing at a low cost, tax benefits, and flexibility in present and future financing. The sponsor's risk is mainly legal risk and the changes associated with the laws. If the sponsor cannot support these changes or does not have the financial resources to address the risk, other project participants must assume the risk.

The **construction lender's** main concern is the design and construction risks. If a project does not get completed, loans do not get repaid. The main goal of the construction lender is to make sure the project gets completed.



The **permanent lender**, who makes the attempt to shift the risk to other project participants, performs various functions including financing the entire construction by arranging adequate debt and making sure all involved are satisfied with the financial arrangements.

The **contractor firm** is obligated to deliver the completed project at a certain date, under agreed-upon conditions. The contractor firm must also try to limit risk of late deliveries and provide enough time to guarantee satisfactory performance evaluations.

The **operator** must ensure fixed, predictable operating costs and limit price risk. The project must also be able to offer a tangible security to the lenders.

The **technology owner**, although not usually a direct participant, has a licensing agreement with the patent holder for use of the technology. As we shall see below, it is wise to use tested technology, not always new innovations. The use of tested technology eliminates unexpected technological surprises and risk.

The **supplier** must deliver adequate materials at a specific price and quality, and observe a rate of delivery the project participants can work with. Usually these participants will have a resource-supply contract to assure cost consistency with the viability of the project.

The output purchaser is mainly concerned with price, quality, and limited distress [11]. These participants will also form an agreement to

assure a price or delivery consistent with the viability of the project.

Each participant may view a project's prospects and characteristics differently, and judge the risks subjectively.

In order to understand various aspects of project finance, it may be useful to study the issues from the viewpoint of one of the largest projects in history—that of British Petroleum's (BP) Forties Field at the North Sea. Figure 1 reveals the essential mechanics involved in providing financing to this project. In 1972, a \$945 million loan was arranged and provided to a syndicated firm, called Norex, which was set up specifically for this purpose and controlled by 66 commercial banks. Norex then provided the funds to the BP-Development Company, a subsidiary of BP involved in the exploration of oil in the North Sea Forties Field through a captive finance company. The provision of the funds to BP-Development, however, was in the form of an "advance" payment for the future deliveries of oil from the exploration site. It was not a straight loan. In turn, since Norex lacked the expertise of reselling the oil in the global market, it signed a contract with the BP-Trading Company to resell the oil at an agreed-on price. BP-Trading, in turn, would resell the oil and pay the proceeds to Norex, which would repay the loan to its parent, that is, the 66 commercial bank syndicates. This form of project finance can be labeled as a "production payment" arrangement.

IDENTIFYING THE SOURCES OF FUNDS

When gathering information on financing a segregated project, the sources of funds and commitment must be identified. Potential sources include commercial banks, leasing companies, insurance companies, pension funds, governmental bond authorities, finance companies, export credits, international financing agencies, private lenders, and customers. Other potential sources may include the participants of the project themselves, such as contractors, equipment vendors, and suppliers.

Loans may be obtained from commercial banks through export credit programs and can be based on the reliability of the repayment from the project. Loans by international financing agencies are usually granted with long maturities on a fixed basis at rates which are often "better than free-market conditions would permit" [18]. Customer credits are an excellent source of loans. In the United States, for example, gas, petroleum or oil companies would be willing to grant credit to ensure low-cost financing in a project finance. Some companies are willing to secure financing directly or obtain support from their governments through requests of funds for new projects. For some project participants, investing in the project may open a new market for their product, so there exists a double incentive: to create a new market and to see the project completed. The financing possibilities are endless, but, unfortunately, so are the risks. The financial lending officer should be able to design a financial plan to fit the existing supply and demand conditions of the global economy as well as the credit market structure to obtain a low-cost financing plan.

"Linking the financing to the fortunes of the project, however, can permit transfer of some hazards to other parties" [18]. Some credit and insurance programs offered by industrialized nations provide nonrecourse financing and transfer some of the commercial and political risks to the funding agencies. It is essential that the project financiers recognize and analyze risk possibilities because of the nonrecourse nature of project debt and contracts. The project financiers must develop the acumen to fully understand and be able to identify risks that will arise during the project stages. There are three reasons for project failure during the design and construction portion of the project: a delay in project completion (and therefore delay in cash flows), insufficient capital to complete the project, and lack of experience by project participants. Other basic risks are "technology failure, uninsured losses, shifts in

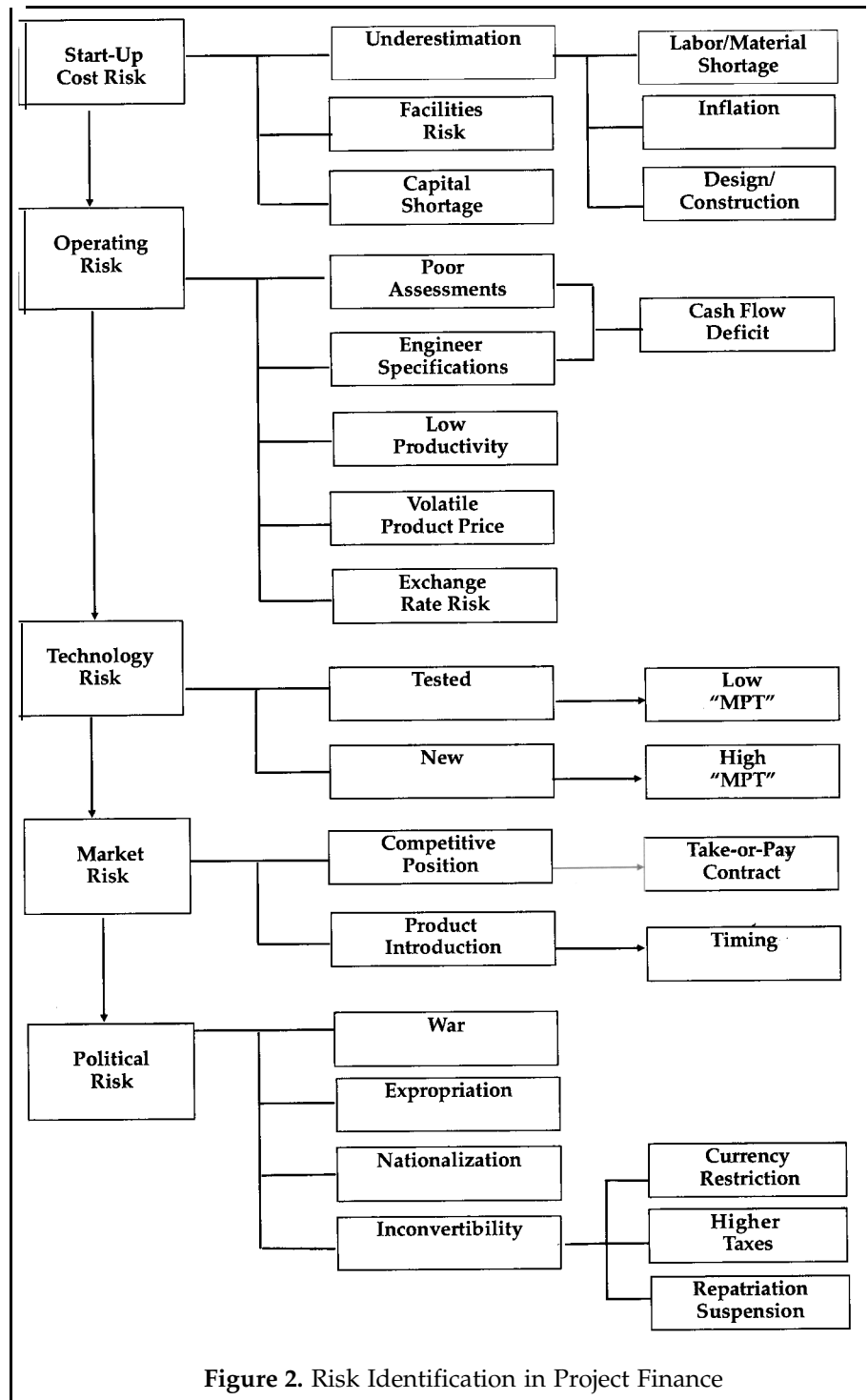


Figure 2. Risk Identification in Project Finance

availability or price of raw materials, shifts in demand or price of output, and negligence in project operation" [11].

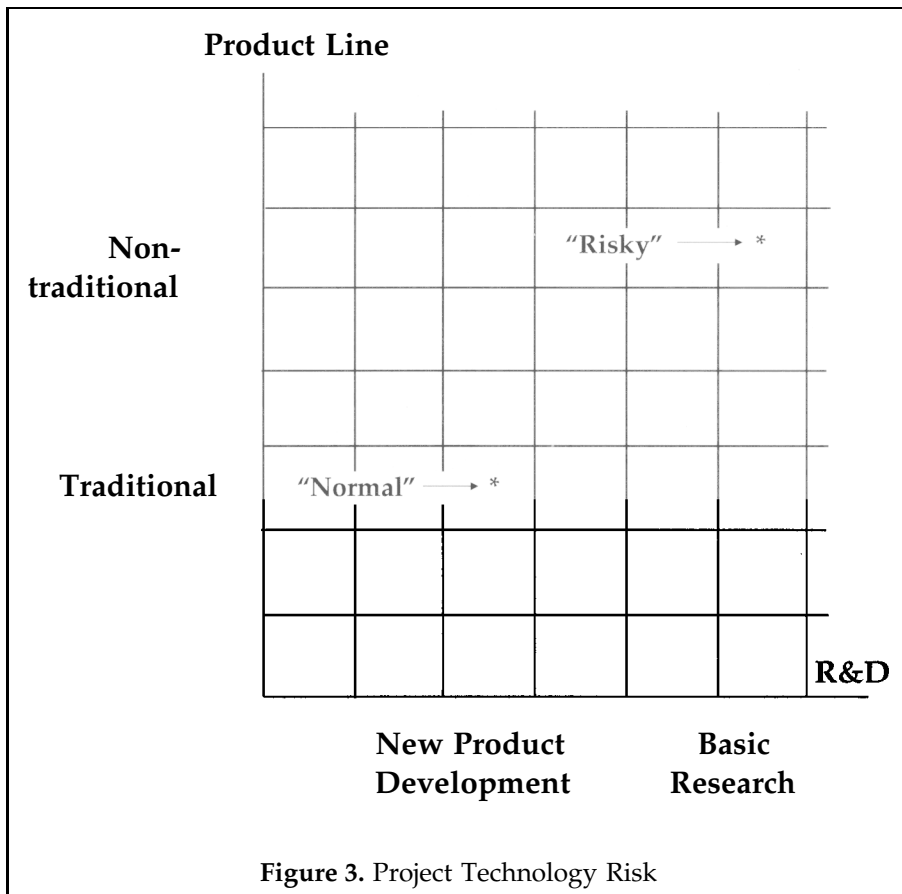
RISK ASSESSMENT

Project risk assessment is the cornerstone of project finance and is central to the success of a project. Analytically and pragmatically,

however, proper allocation of risk is a complex issue in project finance. There are a number of specific risks which can be identified in a financed project as shown in Figure 2 [3] [13] [11] [5].

Start-Up Cost Risks

Project financiers will often drastically underestimate the initial costs



as start-up time may last as long as ten years. This underestimation obviously adds to the overall costs, often as much as 200 percent of original forecasts. The reasons for overruns come from shortages of labor and raw material necessary to produce the output, and from "inflation, inaccurate engineering and design studies, and large operating deficits during the start-up phase" [18]. Other risks in the start-up process include facilities risk and capital shortage. Facilities risk arises as the construction and other engineering aspects of the project are delayed or unfinished by the expected date, leading to delays in the operational stage of the project and expected cash flow.

An example is provided by a copper mining project in Indonesia where initially \$120 million in financing was arranged. By completion time, three years later, costs pushed to the \$200 million mark. Cost push-ups could have been minimized by effective planning in the beginning.

Operating Cost Risks

A project may prove impossible to begin operation or maintain the expected level of output. The expected or expected output may not be sufficient to service the loan, or the output may deplete more rapidly than expected. In such circumstances, a "reclaim account" can be set up and be guaranteed by the sponsor to fill in the gap between market value of the output and the funds needed to service the loan. Moreover, negligence in project operation may occur. Incorrect assessments of the recovery process, not meeting engineering specifications, low productivity due to foreign labor, inflation or unreliable prices, and changes in exchange rates for international currencies are the main reasons for operating cost overruns. Price of output can also fluctuate, causing a shortfall in revenues. Therefore, it is wise when estimating prices during the planning stage to leave room for error.

In the mid- 1970s, a venture with an Australian company left spon-

sors writing off their equity investment in the project. The Australian dollar was re-valued during the project, which in turn made the import price of oil rise and operating costs soar.

Technology Risks

Prior to or after the start-up of operations, the technology used or the development of the product may fail or technical obsolescence may occur. Most project financing plans involve a tested technology in order to eliminate any "technological surprises." Without sufficient credit enhancement to cover the risk of applying new technology, project financing normally does not involve a new, untested technology [11]. However, the newness of the technology component of a project is obviously a matter of degree. The newer the technology, the higher the perceived risk of the project to the lenders. Using observations by Bruce Dannenburg from Digital Equipment Corporation [8] regarding research and development, we can introduce the issue of technology in project financing through a matrix format (See Figure 3).

Each project's level of risk can be determined by the mix of three interrelated indexes: the market (M), the product (P), and the technology (T). Thus, each project can be given a specific "MPT" index. On this basis, a traditional product being newly developed has a low MPT and can be represented by the point labeled "Normal" in Figure 3. As the project technology moves towards basic research and nontraditional product lines, the perceived risk of the project increases (e.g., point "Risky" in Figure 3). A project with relatively high "MPT may increase the rate of return required by the lenders.

Market Risks

A project may face a loss of competitive position in the output market. This is the reason "tight" contracts such as "take-or-pay" are imperative to project financing. Timing is another important aspect of market risk. "A difference of four to five months in the timing of market introduction will have important

strategic and financial implications in a market like automobiles" [5].

Political Risks

Not only do market conditions throw a curve ball at project financiers, but political risk may hinder production in cross-border projects. Even in the industrialized nations (such as Canada), political uneasiness can be felt if the project operation is subject to constant "monitoring." On the other hand, a war may break out in the project's vicinity (e.g., an oil facility located in the Persian Gulf). Expropriation and nationalization may occur, especially if the project involves natural resources such as oil and minerals.

Outright hostile actions toward foreign investments have taken place in a wide range of countries including Peru and Canada. These include:

- Restrictions on and inconvertibility of currency,
- Imposition of high taxes and royalties, and
- Demands for equity participation.

These hostile acts can hinder the economic enticements of the project and the ability to secure a low-cost loan or spontaneous credit.

There are, however, ways to avoid or divert these risks:

- Negotiate with local customers (to provide debt financing to absorb greater price risks in exchange for secured future supply).
- Shift the price fluctuations and floor prices to the customer to transfer the risk from the sponsor.
- Use export credits through government agencies.
- Transfer risk by purchasing insurance from governmental agencies such as Overseas Private Investment Corporation (OPIC).

LENDER RISK

Project finance is often misunderstood by many lenders who are not prepared to assume the risks which a project may possess. On the other hand, many lenders feel that project sponsors do not fully recognize the risks they are asking the lenders to assume. "Deals

have got more complicated not just in structure, but also in terms of risk assessment. Many project financiers have learned to hide financial problems in their financial reports presented to the lenders" [10]. These have included:

- Failing to reveal the incurred debt on the face of the balance sheet, or in any footnotes to financial statements;
- Limiting the recourse nature of the financing of a project;
- Using a great degree of financial leverage to avoid dilution of existing equity;
- Eliminating restrictive covenants in other debt or equity arrangements;
- Forecasting better rates of return over similar projects.

Nevertheless, "banks are prepared to take significantly more risk than they were in the early days as they have learned the business" [14]. From the lenders' point of view, the problem is that these projects are not well-defined commercial entities with credit histories to compare against. Reliance cannot be made on past performance of projects. Moreover, expected cash flows may overlap between different projects. Since projects are based on possibilities, a nightmare for investment and commercial bankers can develop in absence of proper planning. Following is a list of weaknesses put together by bankers regarding risk assessment in project finance.

Overreliance on past performance of projects may lead to a false sense of security for bankers. A solution to this may be for the banker to require contingency plans by the developer that are reasonable and within the developer's capacity to handle.

Failure to evaluate the market may be the most critical error of all. Project financiers who monitor and estimate economic trends correctly and consistently tend to be the ones with successful projects. To help project sponsors become more aware of the market, banks should "define a specific market

area of development loans in such a way that the lender can become an expert on the market area" [10].

Failure to assess the total financial condition of the developer can lead to difficulty in getting a whole picture of the overall financial position. Projects based on combined equity frequently prevent the banker from realizing the total debt of the developer. If debt and cash flows are combined from different projects, it becomes almost impossible to accurately assess the total debt and the liquidity of the developer. That is why these financial statements can recurrently be more confusing than "pure-play" financial proposals. What the project financier needs to bring to the banker is detailed estimates of the project's risk, return potential, engineering reports and contracts between contractors, suppliers, and customers. Most important, however, is separate financial statements for each project with no overlapping of debt and assets. When financial statements overlap or when there is only one combined statement from which to assess financial information, it becomes easier for the developer to hide financial troubles.

Lack of information on the status of all projects of the developer can lead to "delays in construction, the lack of lease up, the lack of sales on other projects," or the success of the project in process or other projects [10]. If the project sponsors are unwilling to share information of this nature with the banker, they may be hiding something that could possibly jeopardize the project. Bankers become leery about information that is withheld that could lead to a project's bankruptcy. If information is presented, even if undesirable, the banker may be able to create a diversion of funds to assist the project financier in expediting the project.

Overlending against specific projects is often the bankers' fault if they base their decision on collateral values rather than economic

values. Bankers are also guilty of letting developers include soft costs such as design and management fees in the construction cost. Banks need to review all assumptions made in the planning stages before giving hard numbers that may be overestimated. It will be to the advantage of both the banker/lender and the developer to intensively analyze the expected project cash flows.

FINANCING OPTIONS

A project financing proposal may force lenders to revise assessments made of the developer's debt-service capacity to include the prognostication of the undertaking. To better assess their debt-service capacity, many industries use the traditional debt-equity ratio. "A project financing typically obtains a debt funding equal to 65 percent to 75 percent of total capital needs" [18]. The financial officer's duties are to structure an agreement to satisfy the private lenders, and perhaps, to shift some of the project's risks to customers, governments, or other project participants. In trying to maximize borrowing access, the project sponsor should distinguish between different options of project finance. The first type of project finance is nonrecourse project financing.

Nonrecourse Project Financing

Nonrecourse project financing or pure project financing instigates a structure that poses no threat of burden to guarantee quittance for project debt by the project sponsor. In project finance, pure nonrecourse against the parent in case of breach or default maybe a very rare incident. At the very least there are "keepwell agreements" or "comfort letters" from the parent signaling that best effort will be made to make the project succeed [3]. Beyond these "sweeteners," there may exist a "completion bonding" signed by the project's stakeholders and/or an insurance company which would guarantee a completion date of the project, a minimum period of operation, thereafter producing a minimum quantity of

output having a certain quality specification at a given cost.² The banker/ lender counts on the collateral of the project to enforce rights and responsibilities in connection with the project loan. There is, however, a financial flexibility called limited recourse that can free up the parent's borrowing capacity for future expansion.

Limited Recourse

Limited recourse requires a completion agreement as opposed to a full guarantee of the project loans and allows the sponsor to overlap credit from project to project. A limited recourse may be available to lenders through various arrangements such as:

Cash-deficiency arrangement, according to which a level or a ratio of working capital is to be maintained by the project sponsor(s).

Cost-company arrangement, where the parent incurs all the project's costs, including the loan service, as expenses in its income statement.

Throughput arrangement, used in the pipeline loans, which forces the owners to ship enough oil in case of a cash flow shortfall to raise the pipeline company's income to a level sufficient to service the loan [3].

Highly-Leveraged Transactions

The use of highly-leveraged debt without a dilution of existing equity is a major advantage to the project sponsor. While the percentage of leverage for a project (varying from project to project) ranges from 65 percent to 75 percent, in extreme cases ratios may approach 100 percent. Other factors influencing equity contributions are the project economics and whether participants commit any equity investment. Since the project's financing is a separate operation, it permits the sponsor to use leverage to a great extent and, in the meantime, avoid restrictive covenants in loan agreements.

Off-Balance-Sheet Project Financing

Another option is the use of off-balance-sheet accounting for project

financing. "Limited recourse, pioneered in the North Sea, took some elements of risk off the balance sheets of the oil companies and handed them to the banks" [16]. By transferring some of the risk, even some smaller oil companies were able to finance projects based solely on estimated future proceeds. The off-balance-sheet option generates a "hidden" or a "segregated liability" [11]. The financing option has been promoted on the grounds that it can "contain project risks" and simultaneously boost the parent company's borrowing power.

The effectiveness of the alternative options has not diminished over time and is being promoted by the SEC and accounting bodies. Ironically, the rating agencies regard off-balance-sheet commitments more advantageous than direct debt. "The rating agencies generally ignore an off-balance-sheet financing unless the obligations amount to more than 5 to 10 percent of the parent's assets" [18].

The off-balance-sheet issue can be alternatively examined from the financial or ratio analysis point of view. Securing a 100 percent debt financing for a project may be impossible because theoretically it would imply a debt-to-equity ratio or leverage of infinity. No naturally-conservative lender would be willing to offer such a loan without requiring an equity investment or substantial guarantees or "sweeteners" of some sort or another which would transfer a certain degree of risk to the project owners or put certain "responsibility" on their shoulders.³

Finally, there may be tax advantages involved in a project financing leading to the use of off-balance-sheet procedures. The decision to buy or lease in project financing often depends on which commercial entity can better utilize the depreciation expense of the facilities as a tax shield. In turn, that decision depends on when and in what magnitude the project can generate positive cash flow. In determining the tax advantages, capital budgeting procedures can be used to decide on the option to buy or to lease.

EQUITY AND NON-EQUITY COMBINATIONS

Equity in combination with the export credits; Build, Own and Transfer (BOT) financial model; Build, Own, Operate and Transfer (BOOT) financial model; and the debt-for-equity swaps seems to give project finance new life. While the use of equity may give the project finance a new life, it does not raise the economic prospects of the project. So far, the limited applications of BOT/BOOT and debt-for-equity swaps have fallen short of expectations or given little security to the doubting financiers.

Export Credits

Export credits can be obtained through international credit agencies. The British Export Credit Guarantee Department (ECGD) recently introduced insurance policies for project financing and encouraged banks to maintain a commitment to projects. The ECGD feels that the bank involved in project financing should incur at least 10 percent of the overall risk or five million pounds, whichever is less. Export credits have also been combined with the BOT model and have had proven results.

BOT Model

On the basis of the BOT model, which stands for Build, Own, and Transfer, the sponsors and/or private parties involved in the project invest their equity to either finance the entire project or give it a financial boost. BOT is on the cutting edge of project finance and can be used as a viable financial model, but its application is only advisable on a case-by-case basis. The BOT equity combination has a twofold function; it generates an added incentive for the contractor to complete the project on time and provides additional economic viability to the project by cushioning the losses. An example of a glamorous, but not necessarily successful, BOT project is the English Channel Tunnel financed at five billion pounds (one billion pounds in equity and four billion pounds in debt).

BOOT Model

The BOOT (Build, Own, Operate and Transfer) model, functions as a "take-or-pay" agreement with joint ventures involving the private sector and export credit agencies. The basic technique of BOOT is to establish a factual and accurate financial plan for the project. The project financier must carefully analyze the project from an investment standpoint, remembering that everything depends on cash flow. Since these projects are more uncertain, more time and effort must go into their planning and investing.

"Where BOOT projects have worked there has still been an element of export credit" [1]. The potential benefits outweigh the costs even if there is more time involved and less certainty.

Debt-For-Equity Swap

The debt-for-equity swaps can help to reduce financing costs and broaden the base of equity investors. Debt-for-equity swaps may include simple swaps of equity for existing debt in a project. With proper timing, swaps can be profitable and can contribute to the project's end. Even banks in Iowa have been willing to take more equity in projects locally and internationally.

CONCLUSION

On the international stage, project finance is as dynamic as ever. Europe is known as the wild card with projects like the Eurotunnel on its list of credits. In London, ventures such as the third River Thames crossing at Dartford are being constructed with financing provided by the Bank of America. Eastern European countries seem eager to establish joint venture projects with the participation of multinational firms from the West. Other parts of the world—South America, Australia, the Commonwealth of Independent States (formerly the U.S.S.R), and China are beginning to enter into the world of project finance. Project finance is on the move up and it is definitely here to stay.

ENDNOTES

1. Many sources such as the World Bank, the International Development Bank, and the Asian Development Bank offer certain advantages in rates and loan maturities, but generally focus on loans to Third World countries for project developments.

2. Singleton argues that nonrecourse project finance "is arguably nonexistent today, given the nature of the construction and operation contracts, with their punitive performance clauses, and with the insurance that is usually taken out against a range of possible mishaps" [16].

3. This view maybe attributed to the so-called "traditionalist" theory, as contrasted to the more recent but highly debatable Modigliani-Miller (MM) theorem in finance. From the viewpoint of the traditionalists, the resulting debt-equity ratio of 100 percent debt project finance would unbearably increase the rate of return (loan rate of interest) required by the lender. While the MM theorem rejects this contention, most practitioners seem to advocate it.

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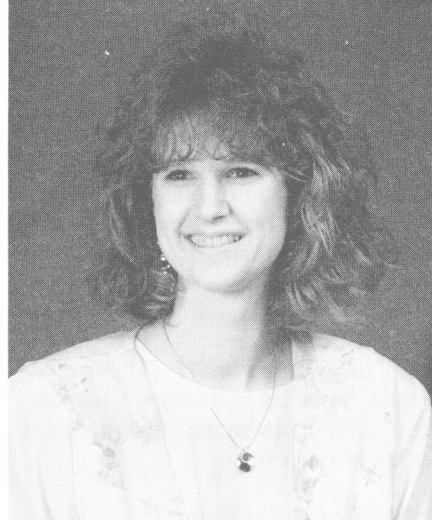
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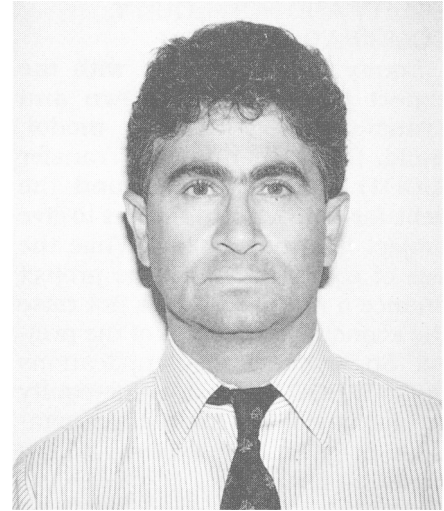
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