

Lehigh University Lehigh Preserve

ATLSS Reports

Civil and Environmental Engineering

11-1-1988

Managing the Complexities of Project Finance

Carl R. Beidleman

Donna Fletcher

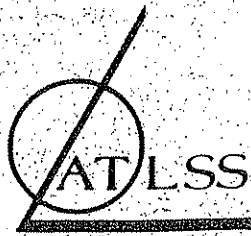
David Veshosky

Follow this and additional works at: <http://preserve.lehigh.edu/engr-civil-environmental-atlss-reports>

Recommended Citation

Beidleman, Carl R.; Fletcher, Donna; and Veshosky, David, "Managing the Complexities of Project Finance" (1988). ATLSS Reports. ATLSS report number 88-10.
<http://preserve.lehigh.edu/engr-civil-environmental-atlss-reports/140>

This Technical Report is brought to you for free and open access by the Civil and Environmental Engineering at Lehigh Preserve. It has been accepted for inclusion in ATLSS Reports by an authorized administrator of Lehigh Preserve. For more information, please contact preserve@lehigh.edu.



**ADVANCED TECHNOLOGY FOR LARGE
STRUCTURAL SYSTEMS**

Lehigh University

**MANAGING THE COMPLEXITIES OF
PROJECT FINANCE**

by

Carl R. Beidleman

Donna Fletcher

David Veshosky

ATLSS Report 88-10

November 1988

An NSF Sponsored Engineering Research Center

PRELIMINARY DRAFT

PLEASE DO NOT QUOTE

MANAGING THE COMPLEXITIES

OF PROJECT FINANCE

by

**Carl R. Beidleman
DuBois Professor of Finance**

**Donna Fletcher
Research Scholar**

**David Veshosky
Research Scholar**

**National Science Foundation Engineering Research Center
Advanced Technology for Large Structural Systems**

**Lehigh University
November 1988**

ABSTRACT

Project finance is the name given the process whereby an economic undertaking is financed based on the future revenue streams ensuing from the completed project. Many large public and private enterprises are confronted with financial difficulties as their financial requirements outstrip the capacity of traditional capital sources. Any project whose future revenue stream can be identified and confidently projected is a potential candidate for project finance.

An assiduous approach to project finance normally entails a high degree of tailoring of cash flows in order to wind up with appropriate contractual arrangements concerning risk identification and allocation from pre-launch to post operation financing. Such efforts typically involve the collaboration of numerous participants in the overall project. Considering the number of participants involved in major construction undertakings, project finance provides the process whereby an enterprise can reach maximum efficiency through the expedient coordination of all its participants.

Although little can be done to alter the underlying risk profile of a project, allocation of the various types of risk to those participants best able to manage them has become common practice in project finance. This paper discusses the major risk components faced in each phase of a project and the many guarantees and undertakings necessary to cover these components through allocation to the appropriate participant. Moreover, emphasis is placed on the ongoing risks of interest rate and exchange rate exposure, as well as those unforeseen and therefore uncontrollable risks facing project finance participants. The capital market instruments available to manage financial risks are also discussed.

The use of vertical integration to control or assure vital supply and distribution avenues was an attempt to manage some economic risks of large projects. This practice has been replaced by the formation of jointly-owned or controlled projects comprised of partners with mutual or complementary goals, talents, and resources. This paper emphasizes partnerships and joint ventures as the more typical financial structures found in project finance, and separate consideration of the preponderance of leasing is made.

It is highly likely that the need for project finance will continue, as capital costs soar in response to technological advancements, as public resources dwindle, and as existing infrastructure requires rehabilitation. Yet, given the high failure rate of potential projects, the challenge for successful project finance is competent management of all exposure through risk allocation, development of strategic alliances, and the ongoing process of financial engineering.

TABLE OF CONTENTS

ABSTRACT

INTRODUCTION	1
Cash Flow Management and Financial Engineering	2
Strategic Alliances	4
Risk Identification and Allocation	5
PRINCIPAL COMPONENTS OF PROJECT FINANCE RISK	6
Developmental Phase	7
Construction Phase	9
Operating Phase	11
Ongoing Risks	14
Recourse Considerations	17
TYPICAL FINANCIAL STRUCTURE	19
Partnerships	19
Joint Ventures	20
Leases of Capital Equipment	22
CONCLUSIONS	23
ACKNOWLEDGEMENTS	

INTRODUCTION

The burgeoning costs of the capital intensive industries (natural resource development, waste to energy facilities, transportation, and industrial plants) for both 'greenfield' investment and rehabilitation of existing structures have escalated the demand for financing beyond the means of traditional single issuer funding. Concurrently in the United States, the ballooning federal deficit has put a strain on public resources, while the international debt crisis has had a similar effect on export industrial development in the third world countries. An answer to the funding needs of the private and public sectors in both the domestic and international markets lies in the more extensive application of the complex process known as project finance.

Project finance is the name given to the process whereby an economic undertaking is financed based on the future revenue streams ensuing from the completed project. The concept of project finance has a long history and has been commonly used over the last forty years in the ship building, natural resource, and oil production industries. Generally, project finance is appropriately applied to projects that entail high capital requirements, a large and often complex risk dimension, and a consequent inability to raise sufficient funds from conventional sources. Many large public and private enterprises are confronted with financial difficulties as their financial requirements outstrip the capacity of local capital markets and their own ability to finance projects.

Privatization (combining the skills and resources of the private sector to replace public sector enterprises) has provided additional interest in project finance. Recent international examples of privatization include the EuroTunnel across the English Channel, a rail link between Orly Airport and the Paris Metro, and the crossing of the Northumberland Strait between New Brunswick and Prince Edward Island. Transportation projects in the United States include a rail link between Southern California and Las Vegas; commuter rail service between Newark and Elizabeth, NJ; toll roads in Colorado and the Virginia suburbs of Washington, DC; and a bridge connecting North Dakota and Minnesota. These privatization projects have been driven by the erosion of traditional public financing and the growing demand for municipal infrastructure improvements. More generally, however, any project whose future revenue stream can be identified and measured is a potential candidate for project finance.

Cash Flow Management and Financial Engineering

Project finance can be tailored to each application based on the economic viability of the project and the relative reliability of its cash flows. Lenders are satisfied to look primarily to the cash flows and earnings of the project or economic entity as the source of funds from which a loan will be repaid rather than to the assets of the project as collateral for the loan. Accordingly, extensive feasibility and engineering studies are necessary for

reliable cash flow projections.

As is true of any financing scheme, expectations for cash flows constitute the fundamental components of analytical input for all financial decisions in project finance. Yet because the operating cash flows provide the principal credit support of the project, the reliability of cash flow projections are of even greater concern. 'Due diligence' with respect to the analysis of a project's economic viability is emphasized by sponsors and lenders alike.

Because the project finance process extends from the conceptual and developmental phase to operation of the facility, due diligence is more than a one time concern of cash flow management. Participants in project finance, from resource owners to developers, contractors and financial intermediaries, agree that the analytical effort necessary to develop a project finance plan is often vastly underestimated. Hence, the failure rate of projects may be higher than in more traditional small business undertakings. Further, no one project is exactly like any other; rapid changes in the world's financial markets and increasing technological sophistication mean that each project financial package must be custom built. Whether a financial advisor is utilized for this purpose, or the sponsor supports a project finance department within its own organization, an interdisciplinary approach is necessary for efficient coordination of the project and the participants.

Structuring the financing of a complex project is akin to design engineering, as it involves putting together or designing a series of capital market instruments in order to tailor the cash flows and credit support (e.g., completion guarantees) to arrive at innovative financial solutions necessary to meet specific project needs. An assiduous approach to project finance normally entails a number of financial aspects of an engineering process with respect to contractual arrangements, risk allocation, and arrangement and rearrangement of cash flows, from pre-launch to post operation financing. Such efforts normally involve the joint collaboration of numerous participants in the overall project.

Strategic Alliances

Alliances between participants in project finance have taken on increased significance in order to ensure an efficient, viable project. The very size and complexity of most projects means that several sponsors may be involved in order to provide the financial muscle and the technical expertise required for successful completion of the project. Considering the number of participants related to the entire process of the project, from pre-bid stage to operation, project finance provides the process whereby an enterprise can reach maximum efficiency through the expedient coordination of all its participants. Moreover, quality control of equipment and raw material supply, as well as efficient operation and maintenance of the facility are more likely to occur

when participants have a history of working together and proven reputations for reliable performance. Strategic alliances with other participants in a project also improve the deal flow for future projects.

Risk Identification and Allocation

Throughout the world many attractive projects have been proposed for subsequent adoption and deployment. Those that reach successful completion, however, represent a very small proportion of the total number considered, estimated to be less than twenty percent. This low percentage of proposed projects that reach successful completion results from the great deal of uncertainty that has been associated with the complex process of project finance. Delays in adoption and delays in completion with consequent delay in the contemplated revenue flow, technical failure, poor management, and legislative/regulatory changes are a few of the common causes for the high failure rate. The key to accurate forecasts and successful project finance is to identify and manage these risks.

Although little can be done to alter the underlying risk profile of a project, allocation of the various types of risk to those participants best able to manage them has become common practice in project finance. A matrix of the various risk components and project participants is useful for risk allocation purposes, and is often formulated by a financial advisor to aid in legal

discussions and contractual arrangements. An example of such a matrix can be found in Table I and discussion of the risk aspects of project finance and the contractual arrangements follows. Table II extends the risk matrix concept to include the sequential phases of the project finance process and the contractual arrangements.

PRINCIPAL COMPONENTS OF PROJECT FINANCE RISK

The type and degree of risk involved in project finance varies by project and industry. Cogeneration projects, for example, are exposed to a high degree of political risk, while resource development projects are noted for the reserve risk. Project finance requires skill in identifying the areas of risk at all stages of a project, allocating each risk component to the appropriate participant, and arranging the many guarantees and undertakings necessary to cover each component of risk.

Before discussing the types of risk inherent in project finance, it must be made clear that modern project finance implies a fundamental change both in the conventional methods of risk analysis and in the actual risks that lenders and contractors will ultimately assume. Winning a deal, either as a financial advisor or contractor of a project, can mean improved deal flow, relatively high returns, yet increasingly high risks. And losing a deal can be very expensive. The sometimes staggering complexity of projects and the extensive feasibility analysis that is necessary in order to fully assess a project's viability, can result in financial

Table II

<u>Project Phase/Risk</u>	<u>Participant(s)</u>	<u>Allocation</u>	<u>Mechanism</u>
<u>Developmental Phase/ Technology Risk</u>	Sponsors		Equity or Subordinated Debt
Credit Risk	Banks, Developers Sponsors		Letters of Credit Credit Rating Agency
Bid Risk	Sponsors Financial Advisors		Equity Success Fee
<u>Construction Phase/ completion Risk</u>	Contractors		Performance incentives and guarantees
	Sponsors		Turnkey contracts, use and occupancy insurance
	Suppliers		Performance incentives and Guarantees
Cost Overrun Risk	Sponsors		Fixed price contracts and completion bonds
	Subcontractors		Fixed price contracts and completion bonds
Performance Risk	Sponsors		Completion or performance guarantees
Political Risk	Sponsors		Tax-exempt financing, joint ventures with public partner, and OPEC (country risk)
<u>Operating Phase/ Performance Risk</u>	O & M Contractor		Equity, performance guarantees
Cost Overrun Risk	Sponsors		Throughput agreements, fixed price contracts
Liability Risk	Federal Government Municipality Insurance Companies		Insurance contracts
Equity Resale Risk	Sponsors		Subordinated debt, IFC - GRIP
Offtake Risk	Sponsors (consumers)		Take or pay Take and pay Advanced payments

intermediaries and contractors spending upwards of three years in preparing a bid. It is not unusual for contractors and developers to find it necessary to take an equity position in a project in order to encourage reticent debt investors and banks to accept a larger portion of the project's risk. The project finance market can be characterized as a lot of money chasing very few, yet usually complex and risky deals. The result is that the traditional acceptable levels of security have been stretched and the variations of credit support mechanisms have become almost endless.

The project finance process is typically composed of three distinct phases, developmental, construction, and operating. Each phase has separate financial considerations, is characterized by different sets of participants involved, and has different, often unique risk factors associated with it.

Developmental Phase

The developmental or pre-launch phase requires tenacity, as the technical and environmental studies often may take from eighteen months to three years to complete. Seed money or other financial backing is often difficult to obtain from commercial or investment banks because of the venture capital nature of this stage in the project. Developers and contractors, usually in consortium as sponsors of a project, will take an equity position, sometimes tied to sale of equipment or service of their respective interests. Some sponsors with expertise in a particular industry, such as

resource development, will retain the equity until well into operation of the facility as a competitive edge in future flow of deals. It is also not unusual for financial advisors to provide their services on a success fee basis, taking some of the risk that the project may not get underway or achieve time targets.

The risks associated with the developmental stage and the contractual arrangements that can serve to allocate these risks to the appropriate participant include the following:

Technology Risk - the probability that a new technology will prove uneconomic or infeasible, or that regulations will change regarding use of the technology, such as the Clean Air Act. This risk is associated with energy and other high-tech projects and is assumed by the sponsors of the projects through their equity participations.

Credit Risk - this has to do with the credit worthiness of an individual sponsor, the project as a whole, or, as in the case of a cogeneration project, the utility company. Credit enhancement is often obtained through letters of credit (L/C) issued on behalf of developers. These L/C's are normally issued by small to medium sized merchant banks or commercial banks and serve to allocate credit risk away from the sponsor, such that the lenders need not rely solely on the credit worthiness of the individual sponsor. In other situations, rating agencies (e.g., Standard and Poors) will rate projects based on the credit strength of the sponsor consortium which serves as an implied credit enhancement facility.

Bid Risk - the probability that the project will not be successfully launched. This risk is associated with all projects and is assumed by the sponsors of the project as well as the financial advisors to the project who provide their services on a success fee basis.

Construction Phase

Once a project has been launched, efficient coordination of the facility, from resource supply to labor and equipment management and maintenance is of primary importance. Interruptions at any point during construction may delay the revenue flow and hence jeopardize completion of the project and timely repayment of the project's debt. Further, the risk that changes in legislation or regulations will occur with respect to a particular technological or environmental aspect of the project is a factor in energy and mineral processing projects during the construction phase.

The risks associated with the construction phase and the contractual arrangements that can serve to allocate these risks to the appropriate participant are covered next:

Completion Risk - the probability that the project will not reach the operating stage. The trend in project finance is to lay off this risk to the contractors and for the contractors in turn to allocate segments of it to the equipment and material suppliers. A turnkey arrangement is preferred, yet generally difficult to obtain by the sponsors. Typically, some form of completion

guarantee is given, containing a specified time frame and at a prescribed minimum rate of operating efficiency. These guarantees normally do not expire on completion of construction, but after the expiration of the period of time sufficient to insure that the project will perform as represented. It is also common to utilize performance incentives, such as additional payment to labor or construction management for performance completion prior to the contractual deadline. The possibility exists as well for use and occupancy insurance, associated with transportation projects, to be provided in the contingency that construction is delayed.

Cost Overrun Risk - the possibility that the cost of the inputs to the project will rise above the approved projections at the developmental stage. Any cost overrun must be born by the sponsor or subcontractor. While a fixed price contract may not be available at the start of a project, such an arrangement may be negotiated later if subcontractor bids can be obtained on a fixed price basis. Sometimes this risk can be covered by provision for escalation or for adjustment to take-or-pay contracts for the offtake from the project to cover additional cost. Completion bonds, issued by indemnity companies are also utilized.

Sponsor's Performance Risk - the probability that a sponsor will not perform as to quality standards or time allotments. Like completion risk, this risk can delay or cause the project to fail. Completion or performance guarantees are utilized for this risk and strategic alliances with reputable firms may help alleviate it.

Political Risk - the possibility that legislation or

regulations will change during construction of a project (legislative risk), as well as the possibility that governments will disallow repatriation of funds from their countries (country risk). Political risk is associated predominantly with public sector projects in both the domestic and international markets. Political risks are difficult to control and therefore to allocate, to the point that some developers deliberately avoid projects in the public sector. Many developers involved in public sector projects, particularly transportation, feel that a strong positive political will, expectations of high traffic flow, and an immediate public need must be present before they will consider a project in this area. A strong commitment from the local municipality, such as tax exempt financing, or joint ventures with sponsors that have expertise in public works are methods used to mitigate domestic political risk. Organizations like the Overseas Private Investment Corporation (OPIC) provide expropriation insurance to help counter foreign political risk.

Operating Phase

Once the project has been successfully completed, the financing terms for the debt portion of the capital can normally be more favorably negotiated. Much of the risk associated with project finance has been alleviated at this stage, as the project is now operational. The following risks do exist, however in the operating phase:

Sponsor's Performance Risk - the possibility that operations

and maintenance (O&M) contractors will not perform as to quality standards. Like any other performance risk, this risk is borne by the O&M contractor.

Cost Overrun Risk - the possibility that raw materials, such as fuel in a cogeneration plant, become more expensive than anticipated. Similar contractual arrangements as delineated for the effective allocation of this risk in the construction phase are also utilized here. In waste to energy projects, for example, it is common to tie the price of power to the fuel price in the take-or-pay contracts for the offtake of the project. Throughput agreements are used in pipeline and refinery projects wherein the owner of the facility agrees to provide for both the input and output at a price differential sufficient to cover all costs and debt repayment.

Liability Risk - the risk of death or injury on the operating facility. This risk is also associated with transportation projects in the public sector and may be allocated to the federal government or municipality, or insured against through a private insurance company.

Equity Resale Risk - the possibility that contractors and other sponsors may not be able to exit a project upon successful completion of their performance. There is a very limited secondary market for sponsor equity positions, yet the International Finance Corporation (IFC) has recently considered implementing an insurance program called GRIP, for Guaranteed Repayment of Investment Principal, whereby IFC will purchase equity positions and issue

notes in its name.

Because of the limited secondary market for sponsor equity positions, some sponsors prefer to use a subordinated loan to provide capital to a project, which supports senior borrowings from third party lenders. As debt, the borrowed amount will eventually be repaid, and typically the subordination is limited to specific senior third party loans. Further, the advantage and upside potential of an equity stock position can be preserved by the sponsor lender through stock warrants or stock conversion rights under the subordinated loan agreement.

Off-take Risk - the possibility that the final product from the project will not meet revenue projections because of market price changes. This risk is applicable to all types of projects. It is referred to as steam sale risk in cogeneration plants, toll revenue risk in transportation projects, resale price risk in industrial projects, resource risk in mining and oil development projects, and generally, the overall economic risk of the project. Take-or-pay contracts provide for the payment by the purchaser for a product delivered over an extended term. These agreements also include the provision that payment will be made at stipulated levels, whether the product is taken and sold or not. Lenders find this can be an excellent security in that loan repayment is regularly provided for, even given severe fluctuations in market demand for the product.

Another consumer type arrangement is that of advance payments, common in the resource development industry. In order to secure adequate supplies, a company will subsidize exploration or development by making advance payments. These arrangements vary widely from outright grants to loans at a nominal rate of interest, payable out of production if the venture is successful. Production payments are utilized in the oil industry, whereby the loan is amortized out of the proceeds from the sale of petroleum if and when produced. In any event, the idea is to allocate the off-take risk to those customers or purchasers who rely on the sale of the product in their respective businesses.

Ongoing Risks

Throughout the project finance process, the financial risks of interest rate and currency exposure (if an international project) must be considered. Financial engineering is the most expedient method of handling this exposure, through the use of financial swaps and options or other capital market instruments. Although, it is common for post completion financial restructuring of the debt terms, a diligent financial advisor will consider cash flow maintenance throughout the entire process in his attempts to alter the cash throw-offs from the project to make them acceptable to short term and permanent investors.

Interest Rate Risk - the risk or uncertainty associated with the course of interest rates. Coupon risk captures the impact of changes in interest rates on the cash flows and market values of

borrowers and lenders that employ contractually determined or fixed income securities. Though little can be done to alter the underlying risk profile of project cash flows, the use of coupon swaps provides a convenient means of altering the quality characteristic of expected cash flows.

A coupon swap may be defined as an exchange of a coupon or interest payment of one configuration for another coupon stream with a different configuration on essentially the same principal amount. Both investors and borrowers in project finance can have access to the variety of floating or fixed-rate debt markets that are most available to them, with the assurance that they can swap the debt service income or cost into the coupon configuration of their choice. The financial advisor of a project can effectively design the necessary configuration of cash flows and hence manage them over the course of the project as interest rates change in the capital markets.

Currency Risk - the possibility that foreign exchange rates will change and alter the home currency value of the cash throw-offs from an operating project. This risk is associated with international projects wherein payment of project revenue is made in foreign currency.

To mitigate currency exposure, financial engineering can entail converting the currency of exposed cash flows into the desired home currency in proximate amounts and dates. Short-term foreign

currency transactions in major currencies can be readily hedged in the foreign currency forward or futures markets. However, recurrent transactions, such as the collection of sales revenue of an operating project, entail a much more prolonged period of currency exposure. In these situations, hedging with either a single long-date forward currency contract or currency swap to eliminate the foreign exchange risk, or utilizing a series or strip of short-date forward currency contracts to mitigate the risk and provide flexibility, is more appropriate.

Conversion of the exposed cash flows into the desired currency can also be achieved through the use of currency collateralized loans and foreign exchange options. The particular method chosen depends upon the length of the exposure and hedging period, as well as the currency in which the transactions are denominated. Options are particularly applicable during the bid stage of a project, in that they provide an opportunity to cover uncertain or conditional future foreign exchange cash flows. The option to purchase or sell the foreign currency in question would not be exercised, should the bid be unsuccessful. However, like the foreign currency futures market, the longest option period is limited to nine months, thus curtailing long date application.

Beyond cash flow management of interest rate and currency risk, an area of risk that is a potential factor throughout the entire project finance process encompasses the unforeseen. Uncontrollable

circumstances, such as force majeure events or regulatory changes affecting a cogeneration process, are risks that can not be reliably estimated and are commonly not contractually provided for. Sponsors of a project typically assume this risk themselves, though there is growing pressure and limited success for lenders to assume some portion of the cost of these eventualities.

Recourse Considerations

No discussion of the complexities of project finance would be complete without consideration of recourse. Recourse refers to the right of lenders to attach claims against the sponsor consortium. The key to successful project finance is structuring it with as little recourse to the sponsor as possible, while at the same time providing sufficient credit support for the project through guarantees or undertakings of the sponsor or third party so that lenders will be satisfied with the credit risk.

Asset-based financing, such as real estate development projects, provide excellent security to the lender in event of default on the part of the borrower. Because the physical assets and the future revenue flow of a candidate for project finance are essentially of little value should the project be abandoned, the risk inherent in nonrecourse financing is conceptually the opposite of asset-based financing.

Recourse hinges on the relative ability of the sponsors to abandon

the project. If they can exit the project without any strings attached, the project is considered nonrecourse. True nonrecourse financing therefore relies solely on the cash flows of the project, where there is no economic force bearing on the sponsors to continue to provide capital. On the other hand, de facto recourse occurs if the project is necessary to the sponsor's business, such that the sponsor would be unlikely to abandon it except under very unusual circumstances. It is also often the case that sponsors, in order to protect their professional reputation, are prey to a different form of de facto recourse, and for this reason would not consider abandoning a project.

Given the great deal of risk in project finance, true nonrecourse financings are very rare. It is much more common to arrange funding of a project, especially through the construction phase, on a limited recourse basis. Limited project recourse typically applies to the completion guarantee. Generally, recourse is available to the sponsors for a limited period of time or with respect to one or more types of risk. Defacto full recourse occurs when a preponderance of limited recourse clauses exist such that all risks to some extent lie with the sponsors.

Recourse is an important consideration in project finance because of its implication as to risk and balance sheet exposure. The extent to which a financing approaches full recourse rather than nonrecourse means added risk for the sponsor and perhaps a

deterioration of its debt to equity ratio, which implies a worsening credit stance for existing and future loans to the sponsor.

TYPICAL FINANCIAL STRUCTURES

The use of vertical integration to control or assure vital supply and distribution avenues to manage the risks of large projects has been replaced by the formation of jointly-owned or controlled projects comprised of partners with mutual or complementary goals, talents, and resources. Hence, there has been in recent years an increasing trend toward jointly owned projects in the private and public sectors.

Partnerships and joint ventures are commonly structured entities in project finance with particular legal implications and financing considerations. The issue of recourse therefore, also plays a role in the selection of the financial structure of the project.

Partnerships

A partnership can operate a project, hold property in its own name and enter into a financing arrangement in its own name. Partnerships as entities for joint ownership of a project were largely considered because of the tax advantages afforded them. Tax benefits, including investment tax credit, accelerated depreciation, and non-capitalized start-up expenses, were at one time very considerable, but have been substantially reduced by the

Tax Reform Act (TRA) of 1986. Yet the full force of TRA will not be realized until 1990 and some projects are grandfathered under the act, so some of the tax benefits remain.

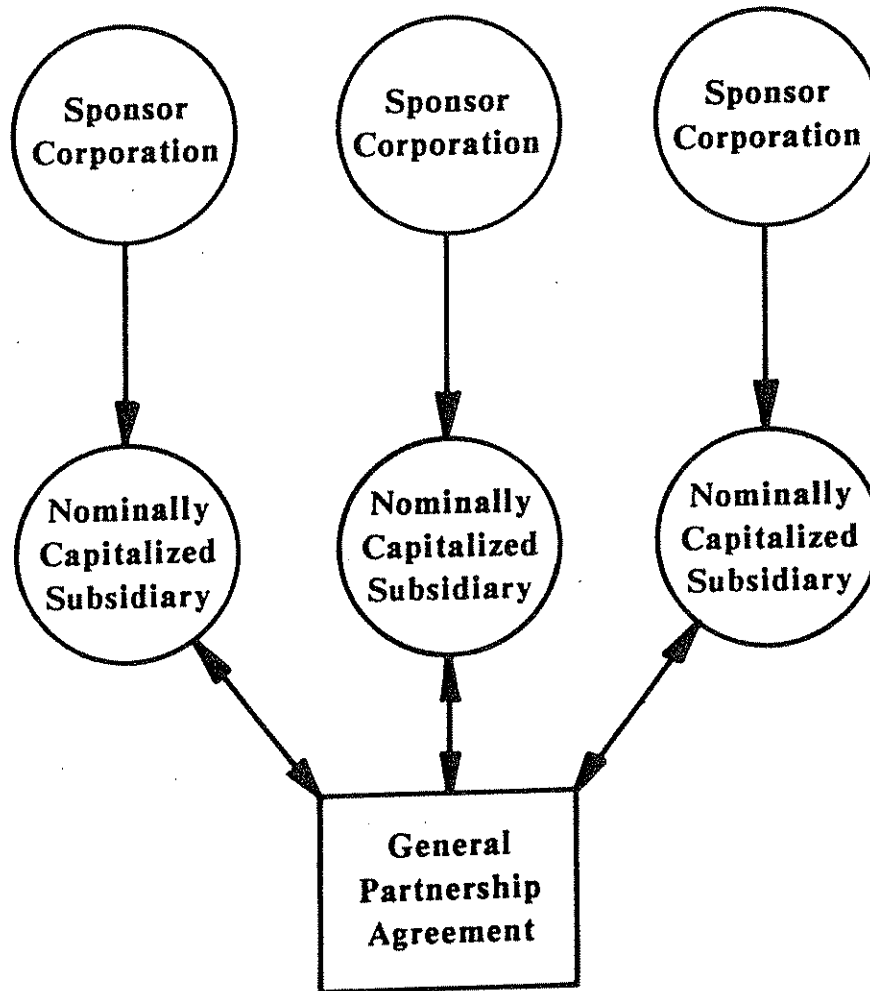
Partners in a jointly owned project can protect themselves to some extent from a legal standpoint by forming subsidiaries to enter into a partnership agreement. Legally, partners can be held to be jointly and severally liable for all partnership liabilities which can not be satisfied from partnership assets. If the subsidiary is nominally capitalized and has limited operations, the parents may enjoy the tax benefits and limit the legal liability. A flowchart of a typical partnership structure is presented in Figure I.

Recourse may be limited to the assets of the partnership and not available against assets of the individual sponsors if the assets of the project are strong enough to support such a financial arrangement. Because a project's assets are substantially valued based on the ensuing revenue flow from the completed project, lenders typically require additional collateral, such as unconditional take-or-pay guarantees on the offtake.

Joint Ventures

Joint venture agreements are employed in project finance to minimize the duties and obligations of the parties to the agreement among themselves and for each other's actions. Sponsors in a joint

Figure I



venture are only liable to the extent of their investment and advances to the project. Each party holds an undivided interest in the property of the joint venture as tenants in common. Further, sponsors may sue each other for breach of contract.

Financial accounting for ownership of joint ventures follows the same rules as for ownership of corporations. More than 50 percent control generally requires line-by-line consolidation. To avoid balance sheet exposure, sponsors must limit their control to greater than 20 percent, but less than 50 percent control. The latter requires only a one-line entry of the investment in the project. It is important to note that the Financial Accounting Standards Board is considering requiring partial consolidation, which would increase the balance sheet exposure.

Joint ventures do not constitute legal entities which can easily borrow for their own account. Sponsors can and do arrange separate financing of the undivided interests in the joint venture. The Alaskan Pipe Line project is a good example of this kind of arrangement. The participants organized a new corporation to serve as operating agent of the pipeline. The facilities are held in proportion to expected use and each of the sponsors is responsible for financing costs of the project in proportion to his or her interest in the project facility.

Joint ventures in projects whose revenue flows are not supported

by take-or-pay guarantees frequently use leasing as a financing vehicle. Leases enable sponsors to be co-lessees of their undivided interest in the leased assets of the joint venture. Due to the preponderance of leasing in project finance, separate consideration is warranted.

Leases of Capital Equipment

The use of a lease to finance some or all of the equipment and facilities of a project has been common in project finance. Third party leasing companies offer an outside source of funds to finance projects which qualify from a credit standpoint. Before the advent of TRA, leasing rates were very attractive as compared to alternate sources of funds due to the fact that the lessor claimed tax benefits which were mostly passed through to the lessee in the form of lower cost lease rentals. The leasing company claimed depreciation and investment tax credit deductions and the lessee was allowed to deduct the full lease payments for tax purposes.

Though the tax benefits have been mitigated under TRA, leases are still employed in project finance because of the low cost, cash flow improvement and flexibility, and credit support that leases provide to the project. A predetermined fixed rent payment schedule permits a lessee to predict future equipment financing costs and cash needs more accurately than if the equipment is owned outright. Payment schedules can at times be designed to coincide with earnings generated from equipment use, with seasonal activity

patterns, or with projected business growth of the project.

Projects arranged as joint ventures can obtain funds on a secured basis provided by the lease. In such a situation, investors will advance funds on the basis of the collateral, the joint obligations of the participants to the joint venture, and the importance of the project to the participants.

CONCLUSIONS

Project finance is fast becoming an answer to the need for the staggering capital commitments necessary to successfully launch public and private works in the international and domestic markets. It is likely that the need for project finance will continue, as capital costs soar in response to technological advancements, as public resources dwindle, and as existing infrastructure requires rehabilitation. The risks are large, yet the payoffs are commensurate, as is evident by the growing list of participants in the project finance arena. Yet, recognizing the high failure rate of potential projects, the challenge for successful project finance is competent management of the exposure through risk allocation, development of strategic alliances, and the ongoing process of financial engineering.

ACKNOWLEDGEMENTS

Valuable insights were provided by the following practitioners. Their assistance is gratefully acknowledged. Errors of omission or commission are the responsibility of the authors.

Air Products & Chemicals, Inc.: Ronald Barclay
Applied Energy Services Inc.: J. Stuart Ryan
Banque Indosuez: Richard L. Hagemann
Bear Sterns & Co., Inc.: Thomas H. Boast
James Preston
Bechtel Financing Services Inc.: Jeffrey McParland
Commercial Union Capital Corp.: E. Bruce Mumford
DnC America Banking Corp.: David Seader
The First Boston Corp.: Clifford L. Fitzgerald, Jr.
Michael C. Miles
The Fuji Bank: Takeshi Takahashi
GE Capital Corp.: Robert Lewis
Robert Marcotte
Raymond Weber
Goldman, Sachs & Co., Inc.: Jeannette Loeb
Preston R. Miller
National Westminster Bank, PLC: Robert W. Halliday
Peter Phillips
Morgan Guaranty Trust Co.: R. Adams Perry III
Municipal Development Corp.: Nicholas Carlozzi
Prudential Capital Corp.: Howard W. Albert
Marcia A. Bates
Salomon Bros. Inc.: William B. Gordon
John J. Schopfer
Union Bank of Switzerland: James A. Ajello