Project Finance: A Credit Strategy Based on Contractual Linkages

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The paper argues that the existing literature on project finance almost exclusively describes it either in terms of the narrow principles of 'non-recourse' and 'off-balance sheet' finance, or in terms of the unbounded sources of finance for industrial investment. As a consequence, definitions and explanations of project finance have tended to be too generalised and in many respects contradictory depending upon the author's perspective or the financial structure of the project in question. In attempting to redress this situation, the paper utilises a case study approach and an empirical survey to derive a better understanding of project finance which explains it in terms of a risk strategy which reconciles the potentially conflicting objectives of borrowers and lenders by utilising the so-called 'community of interests' which exists in the commercial and industrial linkages between the various parties involved in a project.

There is no published data on the size of the project finance market but Gill [1981], basing his estimates on interviews with senior bank executives, suggested that between 10 and 12 per cent of all private Eurocurrency lending was designated for project financing. On the assumption that this estimate still holds good, this implies that in 1995 approximately US$20 billion new private commercial bank lending went on project financing. During the same year the World Bank (IBRD) made loan disbursements totalling US$12.1 billion. This suggests that new project financing in the private and public sectors, even excluding the World's various regional development banks and private placement markets, was in excess of US$30 billion in 1995.

Despite the size and importance of the market, there is still a dearth of

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academic literature on project finance and specifically no precise definition which adequately explains it. In the literature which does exist, project finance is not a precise concept and, in particular, there are no theories of project finance. This is because the literature is mainly descriptive which, at best, has simply helped to popularise the subject without fully explaining it. The small amount of academic research [Wynant, 1977; McGeown, 1980; Gill, 1981] has provided a useful background for understanding the subject, but it too has focused on the descriptive and has emphasised the 'mechanics' of project finance rather than attempting a serious theoretical exposition of the subject. As a consequence there are no obvious structures in the literature which explain project finance in terms of a risk strategy which reconciles the divergent objectives of borrowers and lenders.

Wynant's study [1977] came close to a tentative general theory of project finance because it did attempt to analyse the effects of project finance on the debt-raising capacity of the firm, but it assumed that all forms of financing which were off-balance sheet were synonymous with project finance. This popular conception may also have resulted in some disinformation about the real phenomenon of risk in project finance. In particular, literature definitions seem inconsistent with each other, being either too narrowly modelled on the principles of 'pure non-recourse' and 'off-balance sheet' financing or too unbounded in their reference to diverse capital and money markets as sources of finance for industrial investment.

THE LITERATURE CONCEPT OF PROJECT FINANCE

One of the most important attributes of project finance is its adaptability to the various needs of particular borrowing situations. For this reason Niehuss [1984] defined project finance in terms of five general characteristics:

- The basic credit is self-liquidating and relates to the project's own assets and future expected cash flow.
- The costs of projects are typically very high, and hence beyond the credit capacity of individual sponsors.
- The finance is raised against the needs of a specific development, and hence drawn and disbursed as the project progresses; it cannot be used for any other purpose.
- The financing arrangement is generally 'off-balance sheet' relative to the major sponsors; the project loan does not appears as a liability on the sponsor's balance sheet or come within borrowing limitations or debt service tests contained in the sponsor's outstanding loan agreements.

- The financing tends to be complicated by extensive legal provisions to ensure:
  - that the cash flow from the project will be sufficient to repay the debt; or
  - that debt will be serviced by some credit-worthy party in the event that the cash flow is inadequate or is interrupted.

The first characteristic imparts the much popularised notion that the borrowing project entity should provide adequate intrinsic security value to the lender. In essence it relates to the idea of project finance being conducted on a 'non-recourse' basis, with the project lender's 'rights' relating only to the assets and future earnings of the project. As such it is arguably more important than the other four characteristics which can be classified as either general characteristics or characteristics which have lost some of their significance over time. Leeper [1979: 79] claimed that the concept of non-recourse is the very 'essence' of project finance because the theory of project finances is really concerned with spreading risks: 'assessing the risk inherent in the deal and structuring a security package which spreads those risks among the parties concerned with the project in such a way as to produce a deal which is acceptable to a bank or banks'.

Although imprecise as a definition of project finance, the above quotation is nevertheless helpful because it suggests that the security structure in project finance involves the sharing of risks by creating a 'community of interests' made up of the various parties connected with the project. Brealey and Myers [1988] strengthened this interpretation when they suggested that even when a project finance structure is 'non-recourse', lenders may still require a general assurance from the parent company that it will do its best to ensure the success of the project. Certainly most multinational companies adopt investment strategies which involve expanding international productive capacities through establishing contractual relationships with other companies. Tindall [1975] showed that the advantage of contractual linkages is that they result in the expansion of the international horizons of industrial companies without the requisite increased capitalisation. Another consideration is that without contractual linkages the intrinsic value of the project's assets would, in many instances, be insufficient collateral to support the project debts [Merkey, 1978] and would involve equity risk [Wood, 1980].

The principle of linkage in project finance, although recognised in the literature, is not easily discernible. Nevitt [1989: 3], for example, having identified the main reasons which attract potential lenders to project finance deals, found it necessary to provide what is effectively a supplementary assertion: 'the key to successful project financing is structuring the

financing of a project with as little recourse as possible to the sponsor, while at the same time providing sufficient credit support through guarantees or undertakings of the sponsor or third parties, so that lenders will be satisfied with the credit risk'. Project finance, therefore, is not necessarily completely self supporting, entrepreneurial or independent but rather requires credit support through guarantees or undertakings. Castle's [1979] definition, while emphasising the importance of payment from the future revenue stream of the project and therefore following the established tradition in the literature, also suggests that project finance can involve varying degrees of possible recourse to project sponsors provided they do not amount to full guaranteeing of the loan. Similarly, Bullfield [1980] claimed that the entire concept of project finance is based on the notion that some of the project risks will be taken up by the project sponsors while others will be shared by the lenders.

According to Sarmet [1980], however, project finance involves the lender in primarily ensuring that the project is self-liquidating through a concern about its viability rather than with the mechanics of legal guarantees. In this respect the security is largely economic in value and the main concern is with the proper assessment of the project's technical and commercial viability. This again is helpful because it implies that credit assessment in project finance involves technical and commercial considerations being taken into account. Similarly, in Fidler's [1982] view the mere issue of a guarantee does not make a loan secured nor does a general reliance on the balance sheet of a parent company. Project finance structures which utilise the benefit of long-term contractual linkages as sources of security may, therefore, be considered less risky than comparable conventional loans which rely on financial guarantees.

THE LITERATURE APPROACH TO CREDIT RATIONING

In assessing a project finance proposition, bank management is essentially concerned with the allocation of scarce resources, specifically the rationing of credit. The literature approach to credit rationing has evolved over the years, moving away from the neoclassical microeconomic perceived market failure approach [Kareken, 1957; Hodgman, 1960, 1962] towards the theories of finance which draw upon the economics of imperfect information. As such they are concerned with agency costs, adverse selection, moral hazard and asymmetric information, etc. [Jaffee and Russell, 1976; Baltensperger, 1976; de Meza and Webb, 1987].

As the management and ownership of most joint stock banks will be separate, the question arises as to what extent the actions of management will maximise bank profits and, therefore, the owners return on their equity

investment? To the extent that management does not maximise profitability, this can be construed as a cost to owners, i.e. the agency cost. In a perfect market managers will undertake projects and allocate credit until the marginal rate of return equals the market determined discount rate. The shareholder's wealth, therefore, is seen as being the present value of future cash flows discounted at the opportunity cost of capital, i.e. the market determined rate. Uncertainty in the real world, however, means that the market is invariably less than perfect which means that management are not necessarily in a position to maximise returns for any given project.

Market imperfections are introduced into the credit assessment process in a number of different but interrelated routes. For example, because both lenders and borrowers will have different information sets there is the distinct possibility of asymmetric information. This possibility stems from the fact that the process of obtaining information, either from the perspective of the lender or the borrower, can be both time consuming and expensive. This will almost invariably necessitate the borrower having to make a judgement regarding the marginal benefit and cost of obtaining additional information and may result in the lender actually making the credit decision on a less than perfect information set.

In this respect, project financing takes on an additional dimension because it is usually complicated and may involve untried technologies [Vyakernam and Jacobs, 1991]. Technological uncertainty infers that bank lenders will find it difficult to assess a project's profitability as they do not fully understand the technology and therefore cannot have a full appreciation of its feasibility from a technical perspective. This consideration suggests that project finance should be regarded as a specialism within banks and dealt with by managers concentrating exclusively on this type of finance.

The incidence of asymmetric information and untried technologies suggests that with project financing there will be a high risk of adverse selection [Akerlof, 1970] which will result in a misallocation of financial resources. Two typologies have been postulated by Deakins and Hussain [1991] to describe the adverse selection problem: Type I adverse selection (following the statistical hypothesis testing analogy) occurs when the bank rejects propositions which subsequently prove to be successful and, therefore, profitable. Type II adverse selection refers to propositions that are accepted by the bank but subsequently prove to be failures or, using Akerlof's terminology, 'lemons'.

Ceteris paribus the greater the risk aversion of the lending officer (or the bank), the greater the probability of Type I errors. The incidence of Type I errors occurring may also increase in direct proportion both to the size of the deal under consideration and to its degree of relative complexity. In

order to reduce the incidence of Type I (and Type II) adverse selection a prima-facie case can be made for lending officers specialising in project financing within specialist departments.

Within these specialist departments risk is managed by a variety of screening devices which will include the adoption of a pooling or portfolio approach to project finance loans. The portfolio will be typically delineated according to the geographical location and industrial sector of individual projects, and the lending banks will also attempt to 'price to risk', i.e. charge an interest rate which reflects perceived project risks and, in particular, the risk of non-repayment.

Stiglitz and Weiss [1981] argue that not only does such a strategy reflect that in an imperfect market different borrowers will have different probabilities of repaying their loans, but that it might also have a direct effect on the riskiness of the portfolio. This adverse selection effect of increases in interest rates derives from the possibility that in addition to reflecting the lender's perceptions of risk, increased interest rates might also influence the behaviour of borrowers. On this assumption, borrowers' willingness to borrow at high interest rates might be indicating that they believe their probability of repaying the loan is low. Argued slightly differently, higher interest rates or any other variation in the terms of the loan, such as the amount, or the collateral arrangements, and so on, could induce borrowers to undertake projects with lower probabilities of success but higher pay-offs when successful.

As a consequence of these considerations and because project finance, in common with most other types of bank finance, has no 'upside potential', interest rate rises might increase the riskiness of a project finance loan portfolio and reduce bank profits. This is an important consideration because project finance is generally expensive both in terms of interest rates charged and the associated fees compared to other categories of bank lending.

Once the project finance facility has been granted, the lending bank then incurs the problem of attempting to monitor and control its 'investment' by ensuring that the finance is applied to the designated purpose for which it was intended. This fundamental of the principal-agent theory [Mirlees, 1975] can be especially problematic in project finance, especially when projects are located in remote parts of the world, or are unduly complicated either in terms of their sheer size, their financial engineering or packaging, or in terms of the technology being utilised. Under these sorts of condition it becomes extremely difficult for the lending bank to observe and control the project [Hölstrom, 1979] and this introduces the potential for moral hazard, i.e. either the sponsor or a major contractor involved in the project using the finance for a purpose other than for which it was intended. In order

to reduce the possibility of this happening, the lender has two available options: either monitor the development of the project on a regular basis by having sight of architects certificates and releasing successive tranches of finance against certified documents, or by encouraging the borrower and any third parties with a vested interested in the project not to default or renege on their contractual agreements by executing some form of formal security or collateral [Chan and Kanatas, 1985].

Spense [1974] has argued that collateral can be used by entrepreneurs to signal their commitment to the success of a project. On the other hand, Stiglitz *et al.* [1981] have suggested that the degree of collateral could influence the behaviour of the borrower to undertake higher risk loans with lower probabilities of success but commensurably higher pay-offs when successful. Within the context of project finance, the issue is further complicated because there is typically either no recourse or very limited recourse to the sponsor – a consideration which helps to distinguish project finance from other forms of large-scale bank lending used to finance projects.

Whether this fact influences project sponsors to take less risk than would be the case under full recourse remains an interesting question. Certainly within the context of project finance an important objective of lending banks is to introduce an element of recourse either to sponsors or other third parties who have a vested interest in the success of the project. In this respect, banks utilise the 'community of interests' which stems from the contractual and commercial linkages which exist in most large-scale projects.

OBJECTIVES AND METHODOLOGY

With any loan proposition the bank has an obvious vested interest in ensuring that the borrower is totally committed to the deal. With project financing, however, not only are market imperfections typically exaggerated, but the conventional methods of mitigating risk via the execution of conventional security and collateral can be extremely problematic: not only is project financing typically regarded as being off-balance sheet and without recourse to the sponsor or primary borrower, but project assets may be insufficient, especially in the early stages of a deal, to justify and protect the lending bank's loans. A fundamental dilemma facing a lending bank, therefore, is how to lend on an apparently non-recourse basis and yet simultaneously protect the bank from the risk of either outright default or delay in the completion of a project.

A primary objective of the paper, therefore, is to address specifically this question and explain project financing in terms of an overall risk strategy

which somehow reconciles the various divergent objectives of borrowers and lenders. In seeking to adequately address this objective, it was decided in the first instance to conduct a series of preliminary interviews with acknowledged experts in project financing and to ascertain what they understood by the term 'project financing'. In total 14 senior executives were approached and 10 interviews resulted.

The consensus of opinion amongst the interviewees was that project financing is primarily concerned with risk sharing rather than with non-recourse or off-balance sheet finance *per se*. Moreover, they suggested that risk sharing is facilitated by the various linkages which typically exist between the various interested parties involved in a project finance deal. These linkages effectively result in participants having a vested interest in the success of the project, the so-called community of interests, and enable the lending bank to lay off risks which would otherwise attach to them.

This insight into the expert's understanding of the term project financing was quite revealing inasmuch as it had little in common with the mainstream literature definitions. Instead, the experts appeared to be emphasising those aspects of project financing which, up until now, had received either scant or at best peripheral acknowledgement in the literature. The interviews also seemed to reaffirm the basic approach advocated in the paper, namely to explain and examine project financing in terms of an overall risk strategy which attempts to reconcile the potentially opposing objectives of borrowers and lenders.

These considerations prompted the identification of the following two research questions:

- What is meant by the term project financing?
- How does project finance reconcile the conflicting objectives of borrowers and lenders?

In order to develop an empirically based approach to resolving the research questions, a case study based upon a real life proposition was adopted to examine the 'typical' financial structure of a project and the techniques by which the lending banks attempted to mitigate risk. The case study involved a pipeline project, but the structuring and treatment of risk can be regarded as standard practice in most large construction projects.[1]

In addition to the case study, a survey questionnaire consisting of four questions was designed from the preliminary interviews and the literature on project financing and credit rationing.[2] The questionnaire had three primary objectives:

- To ascertain the relative importance of different project finance structures.

- To obtain an insight into the strategic objectives and motives of both borrowers and lenders in project financing.
- To obtain information about the relative importance of different credit support structures involved in project financing.

The bank respondents, who consisted of senior executives and project finance managers, were requested to indicate the degree of importance they attached to a number of factors in connection with each of the three primary objectives. Respondents were also given the opportunity to introduce additional factors which were not incorporated into the questionnaire, but which they believed to be germane to the issues being examined.

CASE STUDY

The possibility of large oil reserves in the Sudan prompted Standard Oil of California to create a subsidiary – Chevron Oil Company of Sudan. Chevron was to undertake exploratory drills and discover whether the region was worthy of commercial development. The company entered into a Production Sharing Agreement with the Sudanese government under which any oil discoveries were to be shared 49 per cent Sudanese government and 51 per cent Chevron. The agreement provided for a 30-year development period, with a 10-year extension at Chevron's option from the date of discovery. Following the discovery of oil, the Sudanese government created the Sudanese General Petroleum Corporation (GPC) with specific responsibilities for monitoring petroleum exploration contracts and to act as a partner with Chevron and other international oil companies.

The remote location of the oil field and the absence of a basic infrastructure for transporting, refining and exporting the productive oil were major impediments to commercial exploration of the oil reserves. Although a transportation system was necessary, it was considered both too expensive and risky for Chevron to undertake on its own. The Sudanese government acting through GPC, therefore, renegotiated the Product Sharing Agreement with Chevron to permit the establishment of a separate pipeline company. Chevron also relinquished 25 per cent of its interest in the full project to Shell Exploration and Production Company. This strategy of separating the 'downstream' transportation pipeline project from the 'upstream' oil field product was intended to improve both the economic viability and risk burden of the overall projects.

As the pipeline and associated facilities were to be financed, constructed and operated entirely separately from the first company, a separate operator company was created – White Nile Petroleum Company (WNPC) at an estimated cost of US$900 million. Some US$225 million was raised in the

form of equity with ownership spread between GPC (42 per cent equity stake), Chevron and Shell (42 per cent) and the 16 per cent balance owned by the World Bank. The remaining US$675 million was provided in the form of private commercial syndicated loans and by official 'soft' loans from the World Bank.

This financial structure presented the Sudanese government (via GPC) as a principal owner and thereby qualified the project for official soft loans from the World Bank. This had the effect of lowering finance costs and lengthening the repayment profile. From the private bank lender's perspectives, ownership was sufficiently spread so that risk was shared equally between the Sudanese government and Chevron-Shell. Additional comfort was also taken from the co-financing of the World Bank and from the fact that the project would generate hard currency from the export of oil.

In essence, the financial structure was designed so that the project was largely divorced from the sovereign risk of the host government. The commercial loans were, however, without recourse to the project sponsors. Consequently, the lending banks wanted to introduce an element of recourse either by laying-off risks onto the sponsors or onto other third parties involved with the project. This usually involves an assignment to the banks of take-or-pay and other project contracts.[3] To explain in more detail how this was achieved, four important project risks have been identified: repayment risk; reserve risk; technical and operating risk; and cost overrun and completion risk.[4]

Repayment Risk

Default was mitigated by a number of contractual techniques. An Export Agreement with the Sudanese government established that a stipulated amount of the oil production would be exported, thereby generating hard currency for the repayment of the loan. Underpinning this agreement, a 'take or pay' contract signed between the upstream and downstream project operators ensured that the pipeline would have a 'captive user' throughout its economic life and, therefore, an ascertainable amount of throughput capacity and tariff income. A Transportation Agreement defined both the amount and method of calculating this tariff which would be sufficient to cover downstream operating costs, debt service obligations and provide dividends equivalent to a 15 per cent return on equity, irrespective of market conditions or the market price of crude oil. Under the terms of the Oil Sales Agreement, Chevron Oil Company Inc. contracted to purchase the tariff oil in hard currency at the market rate for crude but with a minimum purchase price stipulated in the contract.

Reserve Risk

The overall viability of the project was inextricably linked to the amount of extractable oil reserves. Chevron, the principal sponsor, provided a Production Guarantee which ensured both the availability of reserves and the productivity of the upstream project. In the event of production problems or lack of reserves, Chevron was committed to making good the deficiency in project income so as to satisfy downstream operating costs and debt service obligations not met from the sale of tariff oil.

Technical and Operating Risk

The lending banks looked to the principal sponsors, Chevron and Shell, to provide direct guarantees in support of project technical and operating risks, but the parent companies were reluctant to assume direct risks. Guarantees were, therefore, provided by a number of subsidiary companies within the Chevron and Shell groups. Other technical risks were covered by a Management Services Agreement between the project operator companies and Chevron Overseas. Under this agreement management and technical services would be provided to the Chevron Oil Company of Sudan throughout all stages of planning, construction and operation until such time as all of the commercial bank loans had been re-paid.

Cost Overrun and Completion Risk

A Cash Deficiency Arrangement established that in the event of cost overrun the sponsors would provide additional funding in the form of senior debt secured on a *pari passu* basis with other project loans up to an amount not exceeding a debt-to-equity ratio of 79:21. Thereafter, funds would be provided in the form of either unsecured subordinated loans or equity. Under the Project Fund Agreement Chevron also guaranteed that if the project was not completed by a certain date, it would honour the project operator's obligations to repay all project loans. In return, Chevron sought protection against *force majeure* risks, nationalisation of the project by the Sudanese government or any other occurrence adversely affecting the project, its business prospects or financial conditions.

From a legal and practical perspective, obstacles in the way of enforcing some of the contracts referred to in the case study make litigation a singularly unattractive option [Wood, 1980]. Their importance, however, should not be underestimated, because no matter how theoretical the remedies appear, they undoubtedly increase the bargaining and negotiation power of the banks especially in instances where things go wrong. In addition, the contracts impose some sort of monetary penalty as a disincentive against sponsors and other third parties abandoning the project. In this respect the security structure ostensibly based upon the commercial

and contractual linkages within the project arguably reinforces the 'community of interests' which exists in large-scale projects.

THE SURVEY RESULTS

In order to examine further the practices observed in the case study and to establish whether they were in fact 'standard practices' from which generalisations could be made, a survey was conducted. In total 100 questionnaires were mailed to banks and non-bank institutions who were considered likely to be involved in project finance. The effective population, however, was eventually reduced to 28:[5] 53 questionnaires were returned either because project finance was not part of the recipient's business portfolio or because the head office responded collectively for individual branches or subsidiary companies and a further 19 simply did not respond. While most of the respondents were based in the UK, they included a number of major overseas banking groups. The percentage distribution of the 28 respondents by location and nationality is shown in Table 1.

TABLE 1
PERCENTAGE DISTRIBUTION OF THE SAMPLE RESPONDENTS

Country	By Nationality	By Location
USA	32	8
UK	24	56
Germany	16	16
Japan	12	8
Bahrain	8	4
Canada	4	4
Hong Kong	4	4
Percentage Sample Total	100	100

Number of banks in sample = 28

Notes: 1. All of the respondents were situated in departments which specialised in project finance.
2. Total group asset size of respondent banks in US$ = less than 100 million – 4; 100–249 million – 5; 250–499 million – 8; 500–999 million – 6; 1,000–2,000 million – 4; greater than 2,000 million – 1.

Table 1 (see note 1) also reveals that all of the respondents were located within a specialist department dealing exclusively with project finance. This would appear to support the idea that project financing is complicated, involving both untried technologies and asymmetric information, which increases the likelihood of adverse selection beyond the limit normally associated with more conventional lending. The emphasis on specialist departments may, therefore, be symptomatic of the need to reduce market imperfections by developing a pool of specialists working exclusively in project financing. Moreover, as the survey sample was representative of a fairly wide spectrum of banks, at least in terms of total asset size (see Table 1, note 2), specialist project finance departments would appear to be the norm rather than the exception.

In order to 'test' the assertion that project financing is primarily concerned with creating a 'community of interests' by spreading risks via linkages between the project and other interested parties, the survey questionnaire attempted to develop an estimation of the importance of the various types of project finance structure. This approach also appeared highly conducive to better understanding exactly what is meant by the term project finance. Respondents were, therefore, requested to estimate the importance of various types of project finance structure within their own banks by ranking them according to their percentage share of total project finance business.

TABLE 2
PROJECT FINANCE STRUCTURES RANKED ACCORDING TO THE RESPONDENT'S PERCENTAGE SHARE OF TOTAL PF BUSINESS

Type of PF Structures Distribution	Percentage Market
Non-Recourse on Signing	7
Sponsor Performance Guarantee	14
Cash Deficiency Agreement	15
Pre-completion Guarantee	21
Full Recourse Finance	21
Mixtures of Guarantees and Support	22
Percentage Total	100

Number of banks in sample = 28

As Table 2 shows, 'non-recourse' finance does not provide a good basis for a definition of project financing because it only represents about 7 per cent of the total responses. There is evidence, however, to suggest [Brealey and Myers, 1988 and Van Horne, 1986] that even with non-recourse finance there is typically a general assurance from the parent company in the form of a 'keep well agreement' or a 'letter of comfort', which imposes a real obligation [Sacasas and Wiesner, 1987] to do its best in ensuring the success of the project. Similarly, in instances where the lender ostensibly looks to the cash flow of the project for repayment, post completion risks relating to development, construction and commissioning, etc are usually assumed by the sponsor rather than the lender via a completion or a performance guarantee.

What is especially interesting about the responses contained in Table 2, however, are the 93 per cent of respondents who claimed that project financing is concerned with loan transactions which include some form of indirect or direct guarantee. The definitional literature argues that full recourse loans do not qualify as 'pure' project finance and yet Table 2 reveals that 21 per cent of all project loans are in fact supported by some form of guarantee which provides the lender with full recourse in the event of the project failing.

Limited recourse finance, which involves the lender expressly assuming certain commercial risks attached to the project, represents the largest category of project finance transactions. The study suggests that some 72 per cent of project finance structures are of the limited recourse type (see Table 2), including the provision of a limited guarantee for the performance of debt obligations. These guarantees typically incorporate one or more of the following contractual agreements: a through put agreement, a cost company arrangement or a cash deficiency arrangement.[6] As Table 2 shows, some 14 per cent of the project finance structures incorporated either a throughput or cost company arrangement and a further 15 per cent had some form of cash deficiency arrangement.

These results certainly seem at odds with the broad mass of definitional literature with its emphasis either on 'non-recourse' or 'off-balance sheet' financing. The results, however, are highly compatible with the literature on credit rationing with its emphasis on mitigating adverse selection by maximising security and with the peripheral definitional literature on project financing, which regards it as a theory concerned with creating linkages with the objective of spreading risks to produce a deal which is acceptable to both lenders and borrowers.

A possible explanation for the dichotomy in the definitional literature may stem from the fact that most of it has been written by practitioners rather than academics. Consequently, there is a bias towards the

practicalities of lending with an understandable emphasis on the legal and physical separation of the project. This approach has taken precedence over the more academic and empirical exploration of project financing developed in this paper, which examines it in terms of a credit rationing theory with the primary objective of reinforcing long term commercial linkages between the sponsor and interested third parties, thereby mitigating risks to the lending bank.

In order to develop further this understanding of project financing, it was decided to try and obtain additional insight into the strategic objectives of the two main parties involved in a typical project finance deal, namely the borrower and the lender.

Borrowers Strategies. In the first instance, the bank respondents were requested to rank in order of importance the borrowers' strategies in terms of twelve objectives and motives which had been identified during the preliminary interview stage.

TABLE 3
DETERMINANTS OF BORROWING STRATEGY

	Frequency of Responses in Percentages					
Determinant of Borrowing Strategy	Very Important	Important	Potentially Important	Not Important	Overall Average Weight	Importance Ranking Based on on Weighting
1. Off-Balance Sheet Considerations	17	30	35	18	29	12 (Int)
2. Circumvention Borrowing Limitations	39	48	13	0	49	5 (Int)
3. Maximisation Yield on Equity	57	30	4	9	54	2 (Int)
4. Taxation Benefits	17	52	26	4	36	9 (Int)
5. Minimisation of Financing Costs	22	52	13	17	38	8 (Int)
6. Minimisation of Investment Risks	70	17	13	17	60	1 (Ext)
7. Minimisation of Political Risks	30	48	17	4	43	6 (Ext)
8. *Force Majeure* Risks	13	43	39	4	31	11 (Ext)
9. Preserve Borrowing Capacity	30	43	26	0	42	7 (Int)
10. Minimisation of Market Risks	44	48	4	4	51	4 (Ext)
11. Minimisation of Completion Risks	13	61	9	17	34	10 (Ext)
12. Maintain Financial Stability	52	30	17	0	53	3 (Int)

Number of banks in sample = 28.

Note: 1. Overall average weight calculated as follows: very important attracts a weighting of 75 per cent; important attracts a weighting of 37.5 per cent; potentially important attracts a weighting of 12.5 per cent; and not important has a weighting of 0.

The results of the analysis shown in Table 3 reveal that the five most important determinants of project finance borrowing ranked according to their average weight are: (1) the minimisation of investment risk; (2) the maximisation of yield on equity; (3) the maintenance of financial stability; (4) the minimisation of market risk; and (5) the circumvention of borrowing limitations.

The determinants of borrowing strategy were regrouped, a priori, according to whether the underlying objectives and motives of the borrower were essentially 'internal' to the borrower and, therefore, do not directly involve additional risk taking by the lender, or 'external' inasmuch as they do have direct risk implications for the lending banks. As the final column in Table 3 shows, the borrower's strategy is marginally motivated by internal rather than external considerations, but perhaps more significant is the balance between the two objectives.

The desire to maximise the yield on equity (the most important internal borrowing objective) without adversely impacting on the parent sponsor's financial gearing is clearly an important objective of borrowers in project financing. Certainly, the evidence from the case study showed that most of the investment from the international companies was in the form of non-cash capital, while the debt finance was largely on a non-recourse or limited recourse basis. Where the international companies had to accept a limited obligation, via performance guarantees, these were invariably accommodated by the local subsidiaries of international companies as part of their normal business obligations. These measures ensured that none of the direct obligations and risks of the project would be consolidated in the parent companies' accounts.

The analysis also revealed that investment risk (followed by market risk and political risk) was the most important external borrowing objective. This finding was entirely consistent with the case study where investment risk was mitigated by a complex process of risk transfer between the participant companies. Specifically, the case study revealed that risk diversification, via the contractual and other undertakings of third parties, resulted in a reduction of risk to both the borrower and the lender. In essence, these undertakings from third parties with a vested interest in the success of the project, i.e. construction companies, suppliers of raw materials, marketing companies, host governments, etc result in the diversification of the project risks and thereby improve the credit rating of the borrower through the project entity.

Lenders Strategies. The preliminary interviews had established that the main objectives of the lending banks in project financing were to control risk and simultaneously earn an above average rate of return on the loan. It

was also established that the lender has basically two distinctive strategies:

1. a conventional approach to project financing which involves taking maximum security or collateral direct from the parent sponsor; or
2. an 'innovational' approach to project financing which places commensurably less emphasis on direct security and financial guarantees from the parent sponsor, but proportionately greater emphasis on third party undertakings.

The first strategy enables the lending banks to assume an indirect or passive interest in the investment decision. As such their main concern is with the overall credit rating of the parent sponsor company which means that there is no need for them to develop internal specialists to identify and manage specific project risks. The lending banks are accordingly primarily concerned with non-project security and the sponsor directly assumes most of the risks associated with the project. Most of the preliminary interviewees asserted that this approach, with its absence of any direct bank involvement in the project, represented a high risk strategy which was not always reflected in the pricing of the loan. The second lending strategy removes most of the disadvantages outlined above because the lending banks take a direct interest in the project in order to ascertain its viability and assess the associated risks. If the risks are not acceptable to the lenders, then appropriate action must be taken in the form of laying risks off onto third parties.

In order to develop and empirically verify the lending bankers' strategy in project financing, the bank respondents were requested to rank 18 risk factors which had been previously identified in the preliminary interviews. These factors were ranked according to their acceptability to the banks using the following criteria: 'readily acceptable', i.e. a risk which will not require a specific provision in the loan agreement'; 'readily negotiable', i.e. a risk which will be acceptable to the lender provided the reward is adequate and related safety criteria are not introduced into the loan agreement; and 'least acceptable', i.e. a risk which is not acceptable and must be transferred to other parties.

The results of this analysis, shown in Table 4, represent estimates of the lenders' risk-bearing capacity. They reveal that in general lending banks typically take on risks which can be readily diversified through their own portfolios, e.g. inflation, interest rate and currency exchange risk, but seek to lay off risks which are project-specific, such as project completion, reliability of technology, quality of output and contractual commitments, which cannot be diversified or managed by the banks as an integral part of their own portfolios. These project-specific risks revealed very little elasticity inasmuch as the lending banks required direct assurances from

other third parties with a vested interest in the project. This is in contrast to such risks as operating costs, debt to equity repayment schedules, cost overrun, and so forth, which are regarded as 'readily' negotiable. This suggests that project financing not only provides ample opportunities for lending banks to become involved in the industrial development, but also that this process is an essential and integral aspect of their risk control strategy.

TABLE 4

ASSESSMENT OF LENDING STRATEGY (percentages)

Risk Factors	Readily Acceptable	Readily Negotiable	Least Acceptable
1. Reserve Size	0	36	64
2. Producing Difficulties	0	41	59
3. Production Start-Up	4	55	41
4. Working Capital Deferred	4	73	23
5. Operating Costs Rise	0	82	14
6. Contractual Commitments	0	18	82
7. Currency Exchange	45	55	0
8. Inflation	51	45	4
9. Interest Rates	45	55	0
10. Cost Overrun	0	77	23
11. Project Completion	0	9	91
12. Quality of Output	0	14	86
13. Market Demand/Prices	14	68	18
14. Debt-to-Equity Increase	14	82	4
15. Reliability of Technology	0	9	91
16. Repayment Profile	9	77	14
17. Political Environment	14	27	59
18. *Force Majeure* Events	18	36	46

Note: N = 28.

In order to ascertain whether security structures were conducive to banks becoming involved in the industrial development of projects, the bank respondents were asked to rank in terms of importance six types of credit support that had been identified in the preliminary interviews. These credit support mechanisms, shown in Table 5, illustrate the nature and the extent to which project-specific and other negotiable risks are transferred to other parties involved in projects.

The results are entirely in accord with those shown in Table 2, which depicts project financing as being primarily concerned with introducing recourse to third parties active in the project. Table 5 indicates that most bank lenders rated as 'very important' supply and sales agreements (91 per

TABLE 5
CREDIT SUPPORT IN LDC PROJECTS

Rank of the Credit Support	Importance (Percentages) Very	Fairly	Potentially	Not At All
1. Supply and sales agreements with international companies*	91	5	4	0
2. Completion/cost overrun undertaking with sponsor companies	77	13	4	5
3. Financial guarantee of host government	41	32	9	18
4. State-owned company as joint venture partner**	23	27	32	18
5. Partnership of an international company offering NO guarantees	27	32	23	18
6. Host government as equity partner	23	9	36	9

Notes: N = 28
* Including take or pay contracts and cash deficiency arrangements.
** Including production sharing agreements.

cent) and completion guarantees (77 per cent) with international companies. Only 41 per cent, however, put a similar emphasis on direct support from host governments and commensurably less emphasis was placed on joint ventures with state owned companies, partnerships with international companies offering no guarantees and host governments as equity partners. This suggests that there is a net flow of credit support from international companies to host countries and that the credit worthiness of the international companies involved in the project is more important than physical ownership of the natural resource.

Viewed in a slightly different way, the results also reveal quite vividly how bank lenders attempt to separate project risks from the country risks of the host government. This is accomplished by identifying the various commercial, financial and industrial linkages that exist between international companies involved in major development projects and making these relationships the bedrock of the lending bank's security. In this way, the security and the viability of the project become inextricably linked and emphasis is placed on the project as a 'going' rather than a 'gone' concern.

CONCLUSION

This article has argued that the existing definitional literature on project finance almost entirely describes it either in terms of the narrow principles of 'non-recourse' and 'off-balance sheet' finance, or in terms of the unbounded sources of finance for industrial investment. Our understanding of project finance has, therefore, tended to become too generalised and in many respects contradictory. In an attempt to redress this situation and derive a more accurate empirical understanding of project finance, the paper adopted a case study approach to establish the method of financial structuring and the treatment of risk in projects. A questionnaire was also developed by reference to the available literature and by a series of preliminary interviews with acknowledged experts in the industry. This questionnaire, together with the case study, provided empirical evidence to suggest that the primary strategic objective of industrial borrowers in project finance was to preserve their borrowing capacity or circumvent any limitations on their debt-raising capabilities and simultaneously avoid or reduce their risk exposure. From the lenders' perspective, the primary objective was similarly to mitigate or lay off risk and earn higher than average rates of return.

In contrast to most conventional loans, risk in project finance does not exclusively relate to the credit worthiness of the sponsor. Although this can be important, a more crucial consideration for the lending banks was the commercial viability of the project as measured by the risks associated with the deal. In order to mitigate these risks and increase the projects' chances of success, banks utilise a variety of contractual techniques which can be loosely called 'guarantees', but which in reality probably confer only limited legal redress. Their importance, however, must not be underestimated because they are important in strengthening and defining third party and sponsor commitment to the project's success. The security structure in project financing places commensurably greater emphasis on the commercial viability and success of the project rather than on the bank's position in the event of failure and loan default. This has led to the conclusion that project finance is perhaps best understood in terms of a risk strategy which reconciles the potentially conflicting objectives of borrowers and lenders by utilising the long-term economic and commercial linkages which exist between the sponsors, lenders and third party participants involved with a project – the so-called community of interests. To date this type of approach has received only scant and at best peripheral mention in the available definitional literature, however this paper has provided evidence to suggest that in future it should form a central position in any serious exposition of the subject.

NOTES

1. See for example the editorial on project finance in *Euromoney*, January 1992, pp.13–17 for a discussion of project finance structures relating to construction projects.
2. A more comprehensive questionnaire was used, but for the purposes of this paper an abridged version has been used.
3. Apart from the assignment of project contracts, the banks also secured the project in the following ways: mortgages over the land and facilities; charges over inventories and equipment, assignment of insurances, assignment of the Operating Agreement, a charge over the shares of the project operator company and the establishment of a trust account to receive the proceeds of sale of the project product.

   The commercial banks syndicated loan documentation also incorporated covenants and the financial restrictions which give the banks additional security. For a discussion of these techniques see, for example: J.B. Howcroft and C. Soloman, *Syndicated Lending by Banks*, (University of Wales Press, 1985); J.F.S. Day, P.J. Taylor and T.G. Major, 'Financial Controls in Corporate Bank Loan Contracts: Banking Practice and Economic Consequences', paper presented at the Annual Conference of the European Association of University Teachers of Banking and Finance, 11 September 1992; C.W. Smith, and J.B. Warner, 'On Financial Contracting: An Analysis of Financial Contracting', *Journal of Financial Economics*, Vol.2, 1979, pp.117–161.
4. In addition to the risks highlighted in the case study, other important risks relating to the project included: currency transfer risk, economic and pricing risk, force majeure risk and country risk.
5. Evidence based on the preliminary interviews suggested that approximately 50 private commercial banks, physically located in London, participated in project finance. As London is arguably still the most important financial centre in the world, most international banks are represented. It can be reasonably inferred, therefore, that the total number of discrete banks operating in project finance throughout the world is not significantly greater than 50.
6. A throughput agreement is applicable where the project involves a process plant or a pipeline. It basically provides a capacity allocation to the principal sponsors and normally incorporates a 'take-or-pay' contract with a minimum tariff volume throughput calculated to generate sufficient cash to service the project loan, regardless of whether the project is able to perform or not. A distinguishing feature of these contracts is the unconditional nature of the sponsor's obligations to make payments for the project's output. This feature causes lenders to regard take-or-pay contracts as being equivalent to financial guarantees, however they do not cover force majeure or political risks.

   Under the terms of a cost company arrangement a project entity is created to own the physical assets of the project and raise the finance. The loan proceeds are subsequently passed on to the owners who also receive all the project's output free of charge in return for agreeing to a pro-rata sharing of all operating costs, including the servicing of the loan. Under this structure, therefore, the 'cost company' does not sell anything, nor does it receive any income or any assignment of rights to a product or a service. Each parent company simply includes in its income statement it share of the project's expenses on account of a 'throughput right' or a 'capacity right' and as such it is tantamount to a guarantee.

   Cash deficiency arrangements similarly establish a direct linkage between the sponsor and the project. They typically establish the sponsor's agreement to provide the operating company with sufficient funds to maintain specified levels of working capital and may even stipulate the extent of the sponsor's liability for the project debt.

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