# SURVEY OF PROJECT RELATED FINANCE IN UNITED ARAB EMIRATES

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**ABSTRACT:** This paper discusses project related finance for construction contractors operating in the United Arab Emirates. The research's assumptions and hypotheses were formulated after extensive literature searches and discussions with members of the industry. To obtain data, a questionnaire was sent to both lenders and borrowers. There were two versions of the questionnaire: one for contractors (borrowers), and the other for banks (lenders). Each version comprised two parts. Part 1 was common to both versions and contained nine assumptions on project related finance seen as suitable definitions of the subject. The respondents were requested to indicate their measure of agreement or disagreement by circling the appropriate number given. Part 2 was a survey of project related financing practice. It contained 17 questions in the borrowers' version and 21 questions in the lenders' version. Interviews were conducted with bankers and contractors. Guidelines for lenders were developed to help in the decision-making process and to help identify the areas that concern bankers most when lending to contractors. The findings, if implemented, should act as confidence building measures between contractors and bankers, whether they look for new relationships or develop existing ones, and could positively influence the opinions of bankers regarding contractors, giving industry the benefit of more stable relationships.



## BACKGROUND INFORMATION

Project finance has become an important constituent in the portfolios of many national and international banks. Since project finance involves the repayment of a loan from the project's income, it involves little or no dependent on the balance sheet of the borrower. Both lenders and investors look at the economics of the project itself and its associated contractual agreements for security rather than the general credit of the promoters.

Project related finance for construction, although important, is less well known. It is a method of financing the construction contractors during project execution by means of agreed facilities linked purely to the project's own planned cash flow. This form of borrowing is evidently becoming popular in the construction industry in the developing countries of the Middle East. Project related finance is looked on as an innovative feature of banking techniques where an equity risk is taken without equity participation. Lenders, however, resort to various methods to protect their interests from the risk to which the borrower and, in some instances, the host country exposes them. A great deal of these methods are centered around the credit worthiness and technical capability of the construction contractor and progress reporting on the performance of the construction project itself.

Since project related finance repayments are dependent on the contractor's capacity to perform and on the construction projects generating the necessary income, lending banks have consequently become more involved in the mechanics of construction. They are compelled to use the appropriate technology and resources that enable them to evaluate the prospective borrower before committing themselves. More importantly, it enables them to review critically the progress of the construction project. The borrower, on the other hand, will want the lending bank's full commitment to provide the necessary facilities at the least cost.

Guidelines to help bankers most when lending to contractors will be presented at the end of this paper. The findings, if implemented, should act as confidence building measures between contractors and bankers, whether they look for new relationships or develop existing ones, and could positively influence the opinions of bankers regarding contractors, giving industry the benefit of more stable relationships.

## RESEARCH OBJECTIVES

The main objectives of this research were to investigate the contractor's choices and decision criteria when considering a project related finance package and the decision criteria of the lending bank for granting the required facility. To achieve these objectives, it was necessary to

- Assess the suitability of bank finance for construction contractors, the methods used in practice and an extensive literature review; the formation of research hypotheses and definition criteria about project related finance and testing them by means of questionnaires, interviews, and case studies
- Investigate contractor's choices of finance, their degree of preference for project related finance, and the lending banks reaction to it
- Provide an insight in the practical world of contractor's management of tenders through the cost estimate and the handling of their finances after award and during construction
- Examine the financial cycle of different construction projects and see its influence on their progress
- Develop guidelines for lenders and borrowers to adopt when considering project related finance facilities for construction contracts

## RESEARCH METHODOLOGY

Banks have traditionally played a key role in providing financing for construction contractors. This research analyzed 28 different construction projects and found that the contractors employed to execute them all relied on some form of bank finance, and this confirmed the interdependence between the construction industry and banks. A clear indication of how important construction contractors treat the subject is in their increased reliance on in-house financial experts. Seventy-five percent of the contractors who completed the questionnaire confirmed that they use in-house financial experts. Fifty-nine percent of them also considered project related finance as very important, and 17% of them considered it important.

After formulating the research objectives and methodology, the first part of the research was devoted to a literature review,

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and data were gathered through distributing questionnaires to both lenders and borrowers and holding interviews with a selected number of them. The research methodology included

- An extensive literature review relating to construction finance
- The formation of two sets of questionnaires for borrowers and lenders to complete
- Distribution of 320 sets of questionnaires to contracting companies and 42 sets to banks
- Holding interviews with senior personnel of 20 contracting companies and eight banks
- Three different projects that were currently under construction during the research chosen as case studies to reinforce the results of the findings
- An analysis of the findings carried out and the research concluded with a summary of research findings, definitions, and recommendations

This paper presents the results obtained from questionnaire and interviews. Details of the in-depth case studies have been presented elsewhere (Shawa 1995). The responses obtained were grouped together in the same format as that used in the questionnaire. The questions used in the two versions were of two types

- Closed with ordered choices, where the respondent chooses from a list of alternative answers by ticking a box or circling a number
- Semiclosed, where the respondent can either choose an answer or write one in the space provided

It was decided at the outset of this research to use interviews as well as questionnaires for testing the study's assumptions and hypotheses. The impersonal nature of a questionnaire, with its standardized wording and order of questions, may ensure some uniformity, but a question with standard wording may have different meanings for different people. Although the questionnaires yielded the required results for testing the assumptions and hypotheses, the interviews were necessary to give "in-depth" assessments and verify the information obtained from the questionnaires. The "facts" reported in the questionnaires must, of course, be evaluated in terms of credibility. Eight lenders and 20 borrowers out of those who completed the questionnaires and who practice project related finance, were chosen for interviews. The persons concerned were contacted by telephone, as their names and job titles were known in advance, and appointments were made. None of those contacted declined to be interviewed and all gave between 40 min and 2 h of their time to answer questions and given more details. The "focused interview" approach was used to cover the set topics in a systematic fashion. To focus attention upon a given experience, the interviewer should know in advance the topics or aspects of a question to be covered. In view of this, an interview guide was drawn up consisting of topic headings derived from the research's hypotheses and assumptions and was used in the interviews. The results of the interviews were the verification of both the assumptions and the hypotheses and the risks involved.

While all of the interviews covered the basic substance of project related finance and the study's hypotheses, the emphasis of the interview varied depending on the interviewee. The interviews were flexible, enabling both questions and answers to be clarified where necessary and permitting deeper probing into topics of special interest to the interviewee. The interviewee was also able to expand on the answers and engage in a general discussion that would not have been possible with the questionnaire alone.

In this research, members of eight banks and 20 contracting companies were visited. To respect their confidentiality, it proved impossible to attribute statements or opinions to particular banks, contracting companies, or individuals. However, this did not affect the usefulness of the findings in any way as the members of banks interviewed were designated capital letters of the alphabet where contractors were given lower-case letters.

## FORMULATING HYPOTHESES

To arrive at the research objectives, seven hypotheses were formulated explaining the concept of project related finance, its strategies, and its decision-making criteria. The hypotheses, therefore, had to contain the elements that influence financing construction contracting on project-by-project basis. The contractor's borrowing capability, the financial standing of the employer, the cash flow of the project, the lender's concern with risk, and right of recourse are all salient points that had to be put forward for investigation and testing. The research hypotheses were composed after an extensive literature review. This developed into formulating the idea of project related finance for the execution of construction contracts through borrowings from banks. These hypotheses were tested against the findings of a questionnaire completed by both contractors and bankers and with interviews conducted by the writers with a selected number of participants. The hypotheses of the research were as follows.

### Hypothesis Number 1

The financing structure in the execution of construction projects is a combination of bank loans secured by equity and the contractor's own resources. Contractors resort to project related finance for certain projects that are acceptable to lending banks, only to increase their borrowing capability and consequently to enhance their financial stability.

### Hypothesis Number 2

When approached by construction contractors for project related finance, the lending banks will view their risk exposure as the main criteria before participating in such ventures. If such risks can be defined and tested, then a project related finance lending policy can be formulated.

### Hypothesis Number 3

Extending credit and transfer of risk are main functions of projected related finance. Unlike conventional corporate borrowing, the debt risk to the borrower is significantly less than the loan security and credit risk to the lender. Risk transfer is achieved when lenders can treat receivables from the construction project as a substitute for the credit worthiness of the borrower. If the credit rating of the project itself can be determined and tested, then it will be possible to minimize the risk exposure of the lending bank and consequently enable it to offer better finance facilities to the borrower.

### Hypothesis Number 4

Before providing project related finance, lending banks analyze the ownership structure and the accounts of the parent company. They perform an analysis of the consolidated accounts to satisfy themselves about the adequacy of the working capital and the gearing of the company. If the working capital and gearing of the borrowing company are not within acceptable limits then the bank may not grant project related finance facilities.

### Hypothesis Number 5

One of the lending bank's main concerns in project related finance situations is the financial standing of the project's employer. This is important as it helps to avoid default in progress payments. Of equal importance is the borrower's technical capability to ensure good performance. If the employer's financial standing or the borrower's capability to execute the proposed project were in doubt, the lending bank would not take part in the venture.

### Hypothesis Number 6

When considering a Project Related Finance package, lending banks will scrutinise the project's cash flow to ascertain that the security in the project's progress payments and the lending margins match their price for funding the project. The lending banks will take the necessary steps to ensure that the borrower's projected cash flows are adequate, as precautionary measures may be taken to reduce or limit the facilities extended if the borrower's cash flow proves inadequate.

### Hypothesis Number 7

Lending banks in a Project Related Finance situation will not surrender all their traditional rights of recourse to the borrower in favor of project progress payments. This is to ensure that if the project should run into difficulties the lending bank will not be totally exposed.

## QUESTIONNAIRE STRUCTURE

As the questionnaire was designed to gather information from two different sources, it was necessary to design two versions while keeping in mind the concept of standardization. Each version had two parts. Part 1 was concerned with the definition criteria of project related finance and was, therefore, common to both versions. It mainly contained the nine assumptions describing project related finance that were to be assessed individually by the respondents. Part 2 was designed to test the hypotheses using a wide range of questions relating to current practice using a less direct approach to that used in part 1. The questions in part 2, however, had to be formulated separately for bankers and contractors in a way that was relevant to each group. Part 2 also included an assessment of the acceptability of 15 different sources of risk. The pilot questionnaire was tested by consulting colleagues in the banking and construction industry.

The questions in part 2 of the bankers's version were as follows. Questions 1 and 2 related to the degree of importance banks give to project related finance and the total value of finance given to construction in one year. Question 3 related to geography and locations. Question 4 investigated whether banks have a specialized department to handle project related finance. The foregoing questions were designed to satisfy the research assessment of bank finance for construction contractors. Question 5 established whether the lending bank investigates the relevant criteria as set out in hypothesis number 4. Question 6 examined the technical capability of the contractor to execute the project. Question 7 ascertained whether finance given is linked to the project and the measure of protection against default. Question 8 enabled the research to test hypothesis number 1, asserting that contractors resort to project related finance only to increase their borrowing capability. Question 9 related to hypothesis number 6 monitoring progress as per cash flow. Question 10 related to hypotheses numbers 3 and 7 regarding assignment of proceeds and right of recourse. Questions 11–18 were designed to satisfy the first and third objectives of the research concerning the assessment of bank finance for construction contractors and the lending banks' reaction to project related finance. Question 19 investigated whether contractors' classification had any effect on the lending banks' decision-making process to extend finance facilities. Question 20 asked how much importance lending banks place on foreign content risk in a project. Risks are also investigated in question 21, enabling the research to produce a risk analysis report. It was also used to test hypothesis number 2.

The questions in part 2 of the contractors' version were as follows. Questions 1–4 related to type of business, turnover, facilities, and the importance of project related finance. Question 5 ascertained if the contracting company used an in-house financial expert. Question 6 established the degree of reliance on bank finance in percentage terms. Question 7 tested hypothesis number 1. Question 8 was to assess the degree of preference for project related finance to satisfy the objectives of the research. Question 9 tested hypotheses numbers 4 and 6. Question 10 investigated the risk in linking finance facilities to the project alone. Question 11 tested hypothesis number 3. Questions 12–15 related to the main objectives of the research. Question 16 asked how much importance was placed on foreign content risk in a project. Question 17 tested hypothesis number 2. It also investigated risks in construction projects enabling the research to produce a risk analysis report.

## DATA SET USED FOR QUESTIONNAIRE

The data gathered from the active and influential participants in finance and construction who participated in the research were directed at finding definition criteria for project related finance, testing the study's hypotheses, and examining contractors' choices of financing techniques and the extent of their reliance on banks. Several project delivery methods were used on the projects performed by the surveyed banks; these included Design-Bid-Build, Turnkey, BOOT, and DBO.

The sample of civil engineering companies to be targeted was selected from the United Arab Emirates (UAE) Contractors' Directory (1992). A stratified sample was taken and the stratification was based on turnover. Their turnover ranged from 11,000,000 to US $470,000,000. The sample of banks

**TABLE 1. Contractors that Participated in Survey**

| Contractors reference (1) | Turnover (1992) (US $ million) (2) | Project related finance (3) |
|---|---|---|
| a | 11.79 | Y |
| b | 30.89 | Y |
| c | 275.00 | Y |
| d | 12.07 | Y |
| e | 30.00 | Y |
| f | 32.76 | Y |
| g | 378.90 | Y |
| h | 19.66 | N |
| i | 12.60 | Y |
| j | 36.79 | N |
| k | 75.84 | Y |
| l | 12.20 | Y |
| m | 33.70 | N |
| n | 474.37 | Y |
| o | 11.11 | Y |
| p | 207.90 | Y |
| q | 255.00 | N |
| r | 14.82 | Y |
| s | 15.75 | Y |
| t | 27.00 | N |
| u | 15.40 | N |
| v | 30.50 | N |
| w | 36.70 | Y |
| x | 27.30 | Y |
| y | 68.50 | Y |
| z | 18.00 | Y |
| aa | 11.75 | N |
| ab | 11.20 | Y |
| ac | 11.00 | Y |
| ad | 11.50 | Y |

**TABLE 2. Banks that Participated in Survey**

| Banks' reference (1) | 1992 capital and reserves (US $ million) (2) | 1992 construction finance (US $ million) (3) |
|---|---|---|
| A | 55.61 | 9.60 |
| B | 63.42 | 19.18 |
| C | 271.37 | 465.75 |
| D | 80.27 | 27.40 |
| E | 51.92 | 19.18 |
| F | 321.66 | 209.46 |
| G | 109.30 | 81.97 |
| H | 91.01 | 68.25 |
| I | 31.49 | 8.70 |
| J | 37.18 | 26.10 |
| K | 12.26 | 15.00 |
| L | 30.64 | 44.30 |
| M | 16.69 | 12.60 |
| N | 47.16 | 23.20 |
| O | 48.85 | 52.30 |
| P | 133.92 | 48.80 |
| Q | 18.45 | 13.10 |
| R | 613.33 | 411.00 |
| S | 488.77 | 220.55 |
| T | 47.70 | 19.70 |
| [Total] | $2,571.00 | 1,796.14 |

was selected from the list of banks in the UAE Central Bank Annual Report for 1992, which comprised 30 large turnover companies, 300 medium turnover companies, and 200 small companies. From these companies a random sample was chosen systematically, i.e., every other firm on the list. The random sample totaled 320, consisting of 15 large turnover companies, 150 medium turnover companies, and 155 small ones. Therefore, the sample taken was approximately 50% of each strata. Of the 320 questionnaires issued to contracting companies, 30 (9.37%) were returned completed and used in the survey analysis (summarized in Table 1). Of the 42 questionnaires sent to banks, 20 (47.62%) were returned completed and used in the survey analysis (summarized in Table 2). The total turnover of the respondent companies for 1992 was $2.210 billion. The total capital and reserves of the respondent banks for 1992 was $2.571 billion and construction finance given was $1,796 billion.

The response rate was 33% of the large turnover companies, 1.3% of the medium turnover companies, and 15% of the small turnover companies. This, therefore, represented 16, 0.1, and 11%, respectively, of all companies in the three groups. The poor response rate from the medium turnover companies was so small that it was disregarded. Therefore the analysis was based on the two groups, i.e., large and small turnover companies.

Samples must be chosen that are representative of a population if the statistical analysis that follows is to be valid. In this research all 20 banks that participated extended finance facilities to contractors as follows:

| Number of Banks | US $ Million |
|---|---|
| 11 | 8–30 |
| 5 | 40–85 |
| 4 | 200–465 |

The 30 contractors that participated in the study had turnovers for 1992 as follows:

| Number of Contractors | US $ Million |
|---|---|
| 23 | 10–40 |
| 2 | 60–100 |
| 3 | 200–290 |
| 2 | 370–475 |

Lotus 1-2-3 Version 3.1 spreadsheet software was used for data storage and retrieval. Testing the relationship between contractors' turnover and bank finance percentage was performed using the Statistical Package for Social Scientists (SPSS) for Windows Version 6.

## ASSUMPTIONS RELATING TO PROJECT RELATED FINANCE

To define and differentiate project related finance from the traditional methods used by banks in commercial lending, nine assumptions were formulated to define the act of lending to execute the construction contract on a project-by-project basis. These assumptions were assessed in part 1 of both questionnaires and expanded upon during the interviews. The questionnaire responses by both the banks and contractors have been summarized and presented in Table 3.

## ACCEPTABILITY OF RISK

A key factor of any type of investment or provision of finance is the degree of risk involved. The literature review and preliminary interviews identified 15 sources of risk that generally have to be dealt with in construction projects and presented them in the questionnaire to both contractors and bankers to assess their reactions. The responses relating to risks have been tabulated (see Tables 4 and 5) and presented graphically in Fig. 1. Full responses were received from 30 contractors and 20 banks. The intensity has been calculated by multiplying responses by the acceptability scale and dividing by the total number of responses (30 for contractors and 20 for banks)

Acceptability Scale for Tables 4–7

1 Acceptable
2 Fairly acceptable
3 Negotiable
4 Acceptable with conditions
5 Unacceptable

Tables 4 and 5 show that the members of the banks that participated in this study considered many of the risks less acceptable than the contractors did. Both were most concerned about uncertainty of project completion and contractual issues. Members of the banks were more concerned than the contractors with respect to deficiency in working capital and adequacy of reserves. Tables 6 and 7 present summaries for the individual contractors and banks with respect to all the identified sources of risk and the table demonstrates the variations between the different organizations. The results have been plotted in Fig. 1.

Tables 6 and 7 demonstrate that lending banks are more cautious than contractors and view their risk exposure as the main criteria before participating. To quantify the degree of risk, banks will analyze the ownership structure and consolidated accounts supplied to the contractors to satisfy themselves that its ownership, working capital, and financial gearing are acceptable. They need be satisfied of the employer's financial standing and the contractor's capability to execute the project before they agree to extend facilities.

## RELATIONSHIP BETWEEN CONTRACTORS' TURNOVER AND BANK FINANCE

The data presented in Table 8 were analyzed and the results summarized. Two scatter plots were produced of turnover against banks finance percentage to see if there appeared to be any relationship between the two (Figs. 2 and 3). It would appear from studying the graphs that no linear relationship exists between the two variables. This was supported by sev-

**TABLE 3. Questionnaire Results Relating to Research Assumptions**

| Assumption (1) | Bank or contractor (2) | Agree (3) | Fair assumption (4) | Disagree (5) |
|---|---|---|---|---|
| Project related finance is a form of lending designed to help both the borrower and the lending bank make the most of the investment by linking loan repayments to the construction project's own cash flow | Bank | 13 | 7 | 0 |
| | Contractor | 21 | 9 | 0 |
| Project related finance differs from company and corporate lending because the project loans are not completely secured by the value of the assets being financed. The lending bank must, therefore, consider progress on the project itself for returns and share major business risks | Bank | 13 | 6 | 1 |
| | Contractor | 21 | 6 | 3 |
| Project related finance involves assigning the project's earnings to the lending bank and may compel the bank to participate in controlling the project | Bank | 13 | 4 | 4 |
| | Contractor | 16 | 8 | 3 |
| Project related finance is purely another form of bank loan designed to increase the borrowing capability of the construction contractor | Bank | 5 | 6 | 9 |
| | Contractor | 6 | 5 | 19 |
| Project related finance is the means to bring together a complete package of financial commitments from the lending bank, and guarantees from the borrower, to ensure the successful completion of the construction project | Bank | 14 | 6 | 0 |
| | Contractor | 14 | 9 | 0 |
| Project related finance structure is more advantageous to the lender through its facility to control risk by separating the project's revenue from revenue of other operations | Bank | 14 | 5 | 1 |
| | Contractor | 18 | 9 | 3 |
| Project related finance allows the borrower not to guarantee all debts because the lending bank relies on the project's performance for risk protection | Bank | 5 | 8 | 7 |
| | Contractor | 7 | 17 | 6 |
| Project related finance means a higher debt-to-equity ratio resulting in a less risky investment for the borrower due to the absence of direct financial guarantees | Bank | 4 | 6 | 10 |
| | Contractor | 5 | 7 | 18 |
| Project related finance is more attractive to lending banks than other financing methods because of the anticipated higher income through larger margins and management fees | Bank | 4 | 7 | 9 |
| | Contractor | 7 | 9 | 15 |

**TABLE 4. Acceptability of Individual Sources of Risk by Contractors**

| Source of risk (1) | Acceptability Scale 1 (2) | 2 (3) | 3 (4) | 4 (5) | 5 (6) | Intensity (7) |
|---|---|---|---|---|---|---|
| Deficiency in working capital | 5 | 10 | 4 | 5 | 6 | 2.9 |
| Adequacy of reserves | 8 | 7 | 3 | 6 | 6 | 2.8 |
| Delay in commencement | 7 | 8 | 6 | 5 | 4 | 2.7 |
| Rise in costs | 7 | 12 | 7 | 3 | 1 | 2.3 |
| Contractual matters | 0 | 0 | 10 | 9 | 11 | 4.0 |
| Variation in interest rate | 8 | 12 | 6 | 4 | 0 | 2.2 |
| Project completion | 0 | 1 | 6 | 9 | 14 | 4.2 |
| Rate of inflation | 11 | 10 | 4 | 5 | 0 | 2.1 |
| Increase in debt-to-equity ratio | 14 | 6 | 5 | 3 | 2 | 2.1 |
| Cost overrun | 2 | 3 | 3 | 13 | 9 | 3.3 |
| Lengthening of repayment period | 14 | 4 | 3 | 8 | 1 | 2.1 |
| Variation in orders and consequent increase in contract duration and price | 22 | 2 | 6 | 0 | 0 | 1.5 |
| Currency exchange variations | 10 | 10 | 5 | 4 | 1 | 2.2 |
| Political change | 14 | 6 | 4 | 5 | 1 | 2.1 |
| Force majeure events | 19 | 5 | 3 | 2 | 1 | 1.7 |

**TABLE 5. Acceptability of Individual Sources of Risk by Banks**

| Source of risk (1) | Acceptability Scale 1 (2) | 2 (3) | 3 (4) | 4 (5) | 5 (6) | Intensity (7) |
|---|---|---|---|---|---|---|
| Deficiency in working capital | 1 | 1 | 3 | 6 | 9 | 4.1 |
| Adequacy of reserves | 0 | 1 | 2 | 5 | 12 | 4.4 |
| Delay in commencement | 2 | 6 | 9 | 1 | 2 | 2.3 |
| Rise in costs | 0 | 4 | 6 | 10 | 0 | 3.3 |
| Contractual matters | 0 | 1 | 2 | 1 | 16 | 4.6 |
| Variation in interest rate | 2 | 5 | 12 | 1 | 0 | 2.6 |
| Project completion | 0 | 0 | 0 | 5 | 15 | 4.8 |
| Rate of inflation | 1 | 8 | 6 | 5 | 0 | 2.8 |
| Increase in debt-to-equity ratio | 1 | 2 | 10 | 5 | 2 | 3.3 |
| Cost overrun | 0 | 1 | 8 | 6 | 5 | 3.8 |
| Lengthening of repayment period | 0 | 2 | 5 | 13 | 0 | 3.1 |
| Variation in orders and consequent increase in contract duration and price | 8 | 2 | 5 | 4 | 1 | 2.4 |
| Currency exchange variations | 4 | 5 | 7 | 3 | 1 | 2.6 |
| Political change | 6 | 4 | 5 | 4 | 1 | 2.5 |
| Force majeure events | 4 | 6 | 5 | 4 | 1 | 2.4 |

eral statistical tests that confirmed that no correlation exists between the two variables.

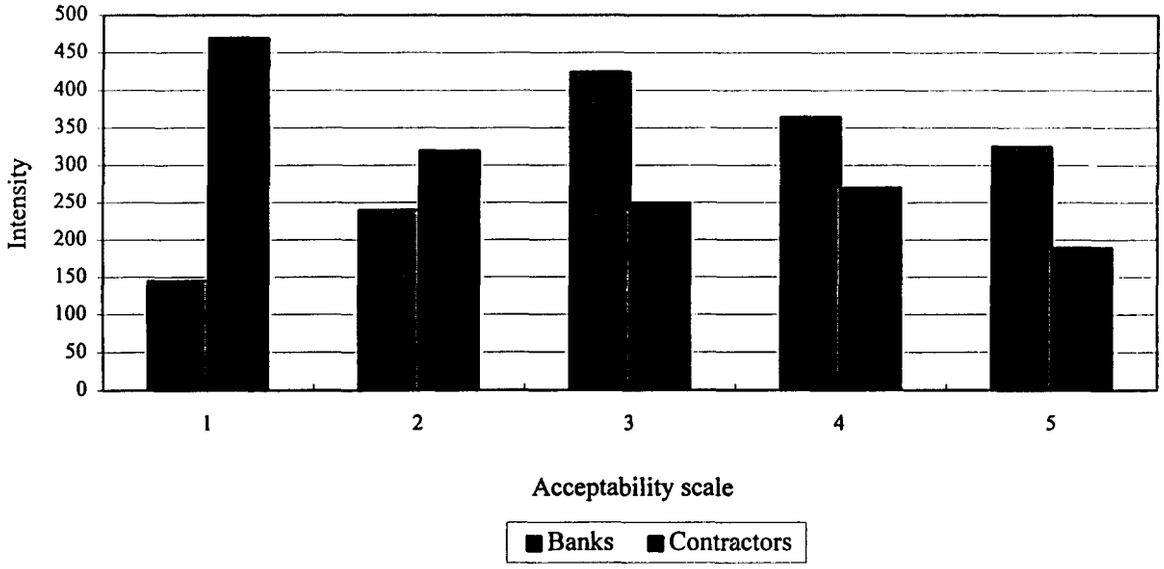
## TESTING THE HYPOTHESES

The findings of the questionnaire supported the research hypotheses except hypotheses 1 and 3. The following is a discussion of the questionnaire responses that were used to test the seven hypotheses. The results of the interviews that were used to further validate the results are presented in Figs. 4 and 5.

Hypothesis 1, asserting that project related finance is practiced by contractors only to increase their borrowing capability and consequently to enhance their financial stability, was not supported. Only eight contractors agreed (contractors' question 7). Although 12 bankers agreed with the questionnaire that contractors would generally resort to project related finance to increase their borrowing capability (banks' question 8), six out of the eight bankers interviewed who actually practice project related finance did not support the hypothesis.

Contractors' question 17 and banks' question 21 showed that hypothesis 2, concerning the treatment of risk exposure, was supported with bankers accepting less risk and allowing more "negotiable." Fifteen types of risks were investigated reflecting the more cautious attitude of banks, contrary to the contractors who accept more risk and allow less negotiable. This is graphically represented in Fig. 1.

Hypothesis 3, concerning the transfer of risk, was not supported. Eleven banks did not consider the assignment of the




1 = Acceptable
2 = Fairly acceptable
3 = Negotiable
4 = Acceptable with conditions
5 = Unacceptable

**FIG. 1. Acceptability of Risk in Construction Projects**

**TABLE 6. Acceptability of Risk by Contractors in Construction Projects**

| Contractors (1) | Acceptability Scale 1 (2) | 2 (3) | 3 (4) | 4 (5) | 5 (6) | Intensity (7) |
|---|---|---|---|---|---|---|
| a | 0 | 4 | 4 | 6 | 1 | 3.3 |
| b | 4 | 4 | 4 | 3 | 0 | 2.4 |
| c | 1 | 8 | 0 | 4 | 2 | 2.9 |
| d | 3 | 1 | 6 | 4 | 1 | 2.9 |
| e | 0 | 2 | 4 | 6 | 3 | 3.7 |
| f | 3 | 1 | 7 | 1 | 3 | 3.0 |
| g | 2 | 3 | 3 | 5 | 2 | 3.1 |
| h | 1 | 2 | 2 | 5 | 7 | 3.9 |
| i | 8 | 4 | 1 | 2 | 0 | 1.8 |
| j | 2 | 6 | 1 | 3 | 3 | 2.9 |
| k | 0 | 2 | 6 | 2 | 5 | 3.7 |
| l | 2 | 6 | 3 | 2 | 2 | 3.7 |
| m | 2 | 1 | 8 | 1 | 3 | 3.1 |
| n | 3 | 4 | 3 | 2 | 3 | 2.9 |
| o | 1 | 1 | 2 | 5 | 6 | 3.9 |
| p | 0 | 1 | 5 | 6 | 3 | 3.7 |
| q | 10 | 1 | 0 | 2 | 2 | 2.0 |
| r | 5 | 5 | 3 | 2 | 0 | 2.1 |
| s | 5 | 5 | 2 | 2 | 1 | 2.3 |
| t | 5 | 3 | 3 | 3 | 1 | 2.5 |
| u | 4 | 7 | 2 | 1 | 1 | 2.2 |
| v | 9 | 3 | 0 | 2 | 1 | 2.2 |
| w | 10 | 1 | 1 | 2 | 1 | 1.9 |
| x | 8 | 3 | 1 | 3 | 0 | 1.9 |
| y | 10 | 2 | 1 | 2 | 0 | 1.7 |
| z | 11 | 1 | 1 | 1 | 1 | 1.7 |
| aa | 6 | 6 | 1 | 2 | 0 | 1.9 |
| ab | 9 | 3 | 0 | 1 | 2 | 1.9 |
| ac | 6 | 5 | 1 | 2 | 1 | 2.1 |
| ad | 11 | 1 | 0 | 1 | 2 | 1.8 |

Note: Average of intensity measurements is 2.6.

**TABLE 7. Acceptability of Risk by Banks in Construction Projects**

| Banks (1) | Acceptability Scale 1 (2) | 2 (3) | 3 (4) | 4 (5) | 5 (6) | Intensity (7) |
|---|---|---|---|---|---|---|
| A | 1 | 0 | 6 | 2 | 6 | 3.8 |
| B | 0 | 0 | 10 | 1 | 3 | 3.3 |
| C | 1 | 1 | 3 | 7 | 3 | 3.7 |
| D | 4 | 1 | 5 | 2 | 3 | 2.9 |
| E | 5 | 1 | 2 | 4 | 3 | 2.9 |
| F | 0 | 0 | 1 | 11 | 3 | 4.1 |
| G | 1 | 0 | 8 | 2 | 4 | 3.5 |
| H | 0 | 0 | 6 | 7 | 2 | 3.7 |
| I | 2 | 7 | 0 | 2 | 5 | 3.3 |
| J | 1 | 0 | 7 | 5 | 2 | 3.5 |
| K | 2 | 4 | 4 | 2 | 3 | 2.7 |
| L | 0 | 1 | 6 | 4 | 4 | 3.7 |
| M | 0 | 3 | 6 | 2 | 4 | 3.5 |
| N | 0 | 3 | 6 | 5 | 1 | 3.3 |
| O | 5 | 1 | 4 | 2 | 3 | 2.8 |
| P | 2 | 3 | 4 | 3 | 3 | 3.1 |
| Q | 3 | 3 | 1 | 7 | 1 | 3.0 |
| R | 0 | 6 | 1 | 1 | 7 | 3.6 |
| S | 1 | 3 | 4 | 3 | 4 | 3.4 |
| T | 1 | 11 | 1 | 1 | 1 | 2.3 |

Note: Average of intensity measurements is 3.3.

project's proceeds as enough security (banks' question 10). Twenty contractors declared that they offered other forms of security than the assignment of progress payments to obtain project related finance (contractors' question 11). Five out of eight bankers and 18 out of 20 contractors interviewed did not support it.

Hypothesis 4, establishing ownership, adequacy of working capital, and gearing as prerequisites for extending project related finance, was clearly supported by 19 out of 20 banks (banks' question 5). Twenty out of 30 contractors supported

**TABLE 8. Turnover versus Banks Finance Percentages**

| Company (1) | 1992 turnover (US $ million) (2) | Finance percentage | |
|---|---|---|---|
| | | Banks' (3) | Own (4) |
| a | 11.79 | 20 | 80 |
| b | 30.89 | 60 | 40 |
| c | 275.00 | 10 | 90 |
| d | 12.07 | 95 | 5 |
| e | 30.00 | 70 | 30 |
| f | 32.76 | 76 | 24 |
| g | 378.90 | 100 | 0 |
| h | 19.66 | 70 | 30 |
| i | 12.60 | 85 | 15 |
| j | 36.79 | 100 | 0 |
| k | 75.84 | 100 | 0 |
| l | 12.20 | 95 | 5 |
| m | 33.70 | 0 | 100 |
| n | 474.37 | 80 | 20 |
| o | 11.11 | 25 | 75 |
| p | 207.90 | NA | NA |
| q | 255.00 | 10 | 90 |
| r | 14.82 | 95 | 5 |
| s | 15.75 | 15 | 85 |
| t | 27.00 | NA | NA |
| u | 15.40 | 75 | 25 |
| v | 30.50 | 85 | 15 |
| w | 36.70 | 80 | 20 |
| x | 27.30 | 80 | 20 |
| y | 68.50 | 70 | 30 |
| z | 18.00 | 75 | 25 |
| aa | 11.75 | 70 | 30 |
| ab | 11.20 | 75 | 25 |
| ac | 11.00 | 70 | 30 |
| ad | 11.50 | 70 | 30 |

Note: NA = not available.

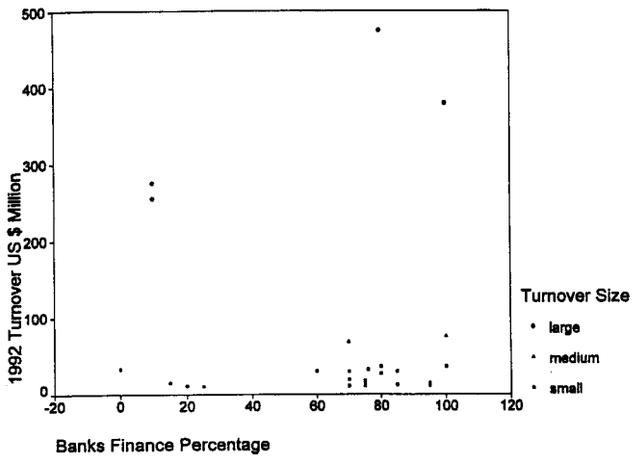



**FIG. 2. Scatterplot of Turnover versus Banks Finance Percentage**

establishing ownership and the investigation of adequate working capital and gearing (contractors' question 9).

Hypothesis 5, directed at the bank's concerns for the financial standing of the employer and the contractor's capability to perform, was wholly supported by all 20 banks (question 5) and this was further confirmed by the eight banks interviewed.

Hypothesis 6, concerning monitoring the project's progress payments by the lending bank to match the cash flow, was supported by 18 out of 20 (banks' question 9) and 25 out of 30 contractors (contractors' question 9).

Hypothesis 7, asserting that lending banks will not surrender all their traditional rights of recourse to the borrower in favor of project progress payments, was supported by 11 banks out

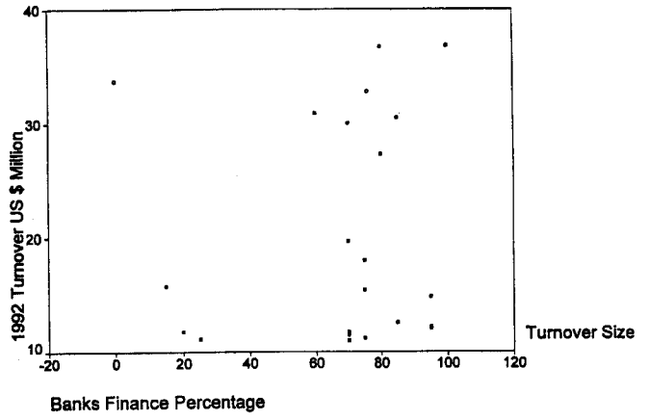



**FIG. 3. Scatterplot of Turnover versus Banks Finance Percentage for Small Turnover Contractors**

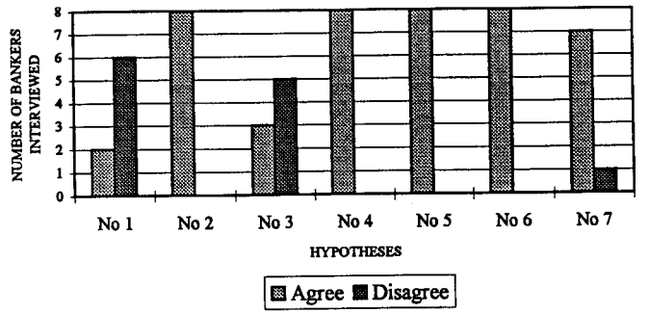



**FIG. 4. Verification of Hypotheses by Interviews with Contractors**

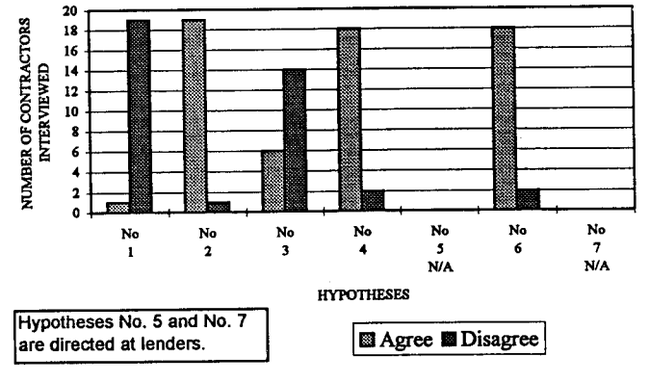



**FIG. 5. Verification of Hypotheses by Interviews with Bankers**

of 20 that participated (question 10). This was further verified by seven out of eight banks in the interviews.

## TESTING THE ASSUMPTIONS

The formation of research hypotheses and definition criteria about project related finance and testing them was one of the six general objectives of this research. Nine assumptions were made that best described the term "project related finance" and were presented in part 1 of the questionnaire, which was completed by 20 bankers and 30 contractors. The data obtained from the questionnaire was further verified by the interviews conducted with eight selected banks and 20 contractors. The same nine assumptions were put forward in the form of questions in the interviews that were conducted with eight bankers and 20 contractors chosen from those who responded to the questionnaire.

The analysis of the responses to the questionnaire revealed that both bankers and contractors agreed upon the following assumptions:



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- Number 1, which stated that project related finance is a form of lending designed to help both the borrower and the lending bank make the most out of the investment by linking loan repayments to the construction project's own cash flow
- Number 2, where project related finance differed from company and corporate lending because the project loans were not completely secured by the value of the assets being financed and that the lending bank should, therefore, consider progress on the project itself for returns and share major business risks
- Number 3, whereby project related finance involved assigning the project's earnings to the lending bank and may compel the bank to participate in controlling the project
- Number 5, which showed project related finance as the means to bring together a complete package of financial commitments from the lending bank and guarantees from the borrower to ensure successful completion of the construction project
- Number 6 which stated that Project Related Finance structure was more advantageous to the lender through its facility to control risks by separating the project's revenue from revenue of other operations

The bankers and contractors disagreed on the following assumptions:

- Number 4, which described project related finance as purely another form of bank loan designed to increase the borrowing capability of the construction contractor
- Number 8, which stated that project related finance meant a higher debt-to-equity ratio, resulting in a less risky investment for the borrower due to the absence of direct financial guarantees

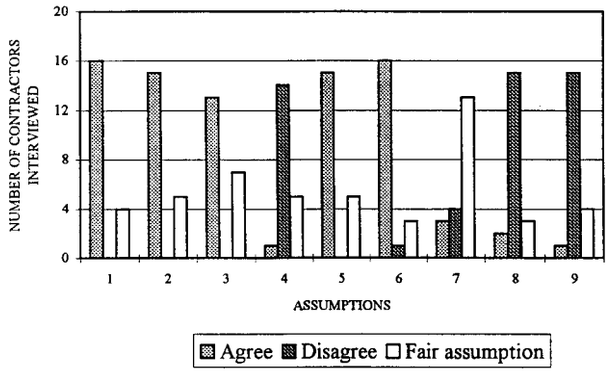


**FIG. 6. Verification of Assumptions by Interviews with Contractors**

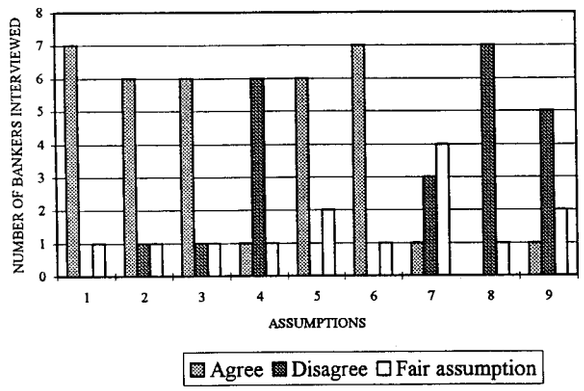


**FIG. 7. Verification of Assumptions by Interviews with Bankers**

- Number 9, which showed project related finance as more attractive to lending banks than other financial methods

However, assumption number 7, which would allow the borrower not to guarantee all debts because of the lending banks' reliance on the projects' performance for risk protection, was given a guarded "fair assumption" rating.

The final analysis of the answers showed that, although the bankers differed from the contractors in the intensity of their agreement or disagreement, they all agreed upon the same five assumptions, disagreed on the same three, and thought one was a fair assumption out of the total of nine. These results were confirmed during the interviews, as can be seen in Figs. 6 and 7.

## SUMMARY OF RESULTS

The main objective of this research was to investigate bank financing for the execution of construction contracts. This led the research to investigate contractors' borrowing from banks and banks' vetting procedures to ensure maximum safety for their investments. The different approaches practiced by contractors to raise credit necessitated the grouping of borrowings into two: company-based loans and project-based loans. The literature treatment of the former was investigated before the research was directed at the latter defining it as project related finance.

Definition of the process was made possible from the answers to nine assumptions made that best describe the subject and put forward in a questionnaire survey that was subsequently completed by 20 bankers and 30 contractors.

The literature review allowed the research to investigate seven hypotheses explaining the mechanics of project related finance. These hypotheses were tested by means of the questionnaire survey and field interviews.

Five hypotheses were validated

- Hypothesis 2, defining risk exposure of lending bank
- Hypothesis 4, establishing ownership, adequacy of working capital, and gearing of parent company
- Hypothesis 5, establishing the project owner's net worth and the capability of the borrower to perform
- Hypothesis 6, monitoring the progress payments to ensure they are as per the project cash flow
- Hypothesis 7, that lending banks will not surrender all their traditional rights of recourse in favor of project progress payments

Two hypotheses were not supported

- Hypothesis 1, the assertion that contractors resort to project related finance to increase their borrowing capability
- Hypothesis 3, that the debt risk of the borrower must be significantly less than the loan security to the lender, and that the treatment of receivables from the construction project can act as a substitute for the credit worthiness of the borrower

The research was then directed at the investigation of contractors' choices and decision criteria when considering a project related finance package and the decision criteria of the lending bank for granting the required facility.

For contractors, it was shown that

- Out of the 30 contractors who participated in the research, 17 considered project related finance as very important, five as important, and three as least important. Five contractors did not comment

- Twenty-two contractors out of 30 used project related finance
- On average, contractors rely on banks to cover 66.28% of the finance required to execute construction projects. This took the form of clean overdrafts, progress payments discounting, letters of credit, and guarantees
- There is no correlation between the size of contractor turnover and percentage of finance due to banks. No linear relationship exists between the two variables
- Of contractors, 66.67% submitted the tender price breakdown to lending banks for their appraisal
- Of contractors, 83.33% submitted the projected cash flow
- Of contractors, 66.67% submitted the balance sheet and capital structure of the company
- Of contractors, 66.67% submitted detailed information about the ownership of the company
- Of contractors, 76.67% submitted information about the employer

As for security offered by contractors

- Offers of assignment of progress payments were made by 33%
- Offers of personal guarantees were made by 27%
- Offers of corporate guarantees were made by 20%
- Offers of fixed deposits under lien were made by 20%

For banks it is shown that

- Out of the 20 banks that participated, two considered project related finance as very important, three important, eight fairly important, six possibly important, and one unimportant
- Thirteen banks had specialized departments to handle finance for construction contracts
- Forty-five percent of banks extended project related finance to contractors
- The limits that banks are prepared to finance contractors varies from 20 to 80% of the latter's turnover
- There is no correlation between the percentage of bank finance and the size of contractor turnover
- All banks investigate the borrower's technical capability and experience, their balance sheet, the adequacy of their working capital, ownership, and the financial standing of the employer before extending finance
- Seventy-five percent of banks study the feasibility of the project
- Seventy percent investigate tender make up
- Ninety percent study the cash flow of the project
- Eighty-five percent study the cash flow of the parent company
- Eighty-five percent of banks monitor project's progress during construction

Overdraft facilities are given by 90% of banks. L/C facilities, bid bonds, performance bonds, and advance payment guarantees are made available to contractors by 85% of banks. Maintenance guarantees are given by 80% of banks. While 45% of banks considered that irrevocable assignment of the project's receivables in the bank's favor afforded enough security, the rest specified corporate and personal guarantees and mortgage of assets as necessary security. They all agreed that the contractor's good performance was the real security.

## RECOMMENDATIONS

This research has been conducted with special attention given to the mutual needs of banks and the construction industry in funding the execution phase of construction projects. The most common finance method contractors use internationally, which is basically a combination of trade credit, delay payments to subcontractors, front-end loading, and the full utilization of working capital, has demonstrated its shortcomings in almost all instances of contractor failures. Tracking of the relevant literature confirms this phenomenon and suggests that contractors appear to rely on self-finance for a proportion of the construction costs. The research proved this to be true but could not find any correlation between these proportions and the contracting companies' size or turnover. The research found that, on average, banks provided 66.28% of finance required by contractors during the construction and defects liability period. This constitutes a massive investment by banks in the construction industry. To minimize risk and achieve good returns on this investment, it is recommended that banks analyze contractor loans and treat them like all other loans to determine their viability and their payback potential. This risk evaluation analysis can be described as a process that passes through three main phases

Phase 1: Market research
Phase 2: Contractor evaluation
Phase 3: Project analysis

Risks associated with each phase should be individually analyzed by banks before they enter into the business of contractor finance.

### Phase 1: Market Research

*Industry and Economic Conditions*

The overall state of the construction industry and the prevailing economic conditions are of paramount importance and should be monitored constantly. They can be a deciding factor in rejecting outright a quality credit proposal. Banks do not look favorably on requests for new credit lines when the construction cycle is in decline or the economy in recession.

*Nature of Demand*

The choice of the employer and striking a balance between the private and public sector are always taken into consideration to reduce payment risk. It is recommended that contractors should be more particular about choosing their employers to avoid failure. A good mix of public and private sector projects is also recommended.

*Regulatory Condition*

The effects of possible changes in importation, currency, and tax regulations should be studied carefully—especially where the project's foreign content risk is high.

*Laws and Legal Procedures*

It is recommended that laws and legal procedures are examined to see if they provide adequate and fair protection to the borrower and whether something can be done to reduce risks associated with litigation.

*Materials and Labor*

Scarcity of construction materials can present major problems, especially when the project is located in a remote area requiring extended supply lines. Possible restrictive labor laws must be investigated.

### Phase 2: Contractor Evaluation

*Technical Capability*

A report on the technical capability of the contractor must be compiled detailing all the resources available, including a

breakdown of manpower, plant list, workshops, offices, labor camps, and accommodation. A list of projects completed in the past three years, with start and finish dates, and another for projects in hand that highlights each contract duration and percentage completion are a useful means of assessing the contractor's performance and ability to take on more work.

*Financial Performance*

Banks need to see a good track record of financial performance and cash management. Financial analysis should be carried out under the following headings:

- Turnover
- Liquidity
- Gearing (leverage)
- Cash flow
- Future outlook

Data regarding the preceding can be obtained from the contractor's audited annual reports for the three years preceding the evaluation, together with some intelligence gathering that is normally available to banks.

### Phase 3: Project Analysis

The project itself must be of a similar nature to those that have been successfully executed by the borrower. It is recommended that the scope of the works, its duration, and value are studied with the borrower's capability in mind. Project analysis should include examination and reporting on

- Employer
- Cost components
- Projected profit
- Execution program
- Conditions of contract and terms of payments
- Duration of contract
- Cash flowchart
- Organization chart

Once the risk evaluation process has been completed, a clearer picture on the viability of extending credit to the particular contractor emerges. The foregoing recommendations, when implemented, will act as confidence building measures between contractors and bankers, whether they look for new relationships or develop existing ones. They could positively influence the opinions of bankers regarding contractors, giving industry the benefit of a more stable relationship. This relationship would then be built on predetermined values that lend themselves to proper analysis and evaluation. It is also recommended that a contracting company should cultivate long-term relationships with more than one bank to achieve its fullest potential. Long-term relationships are beneficial to both parties as they help speed up the decision-making process. This is more in line with current trends that advocate total quality management and "partnering," where parties working closely together over long periods gain confidence and improvement in value of service.

## CONCLUSIONS

To be able to make a general assessment of bank finance for construction contractors and to identify the methods used, an extensive literature review was undertaken. This was followed by the distribution of questionnaires to 320 contractors and 42 banks, 30 of which were returned completed by contractors and 20 by bankers. Interviews were then held with 20 contractors and eight bankers. The research identified the methods used and found that 73% of contractors and 45% of banks used project related finance for financing the execution of construction projects.

The findings of the questionnaire and interviews were tested against the assumptions and hypotheses of the thesis. The findings agreed upon the same five assumptions, disagreed on three, and thought one was a fair assumption. The findings clearly supported five out of the seven hypotheses.

The questionnaire results revealed that 17 out of 30 contractors considered project related finance very important, 11 out of 30 considered company-guaranteed loans as important, and seven out of 30 thought mixing the two was important. The degree of preference for project related finance varied from 19 out of 30 wholly in favor to 21 out of 30 with some reservations. As for lenders, only one bank out of the 20 that participated considered construction lending as unimportant. The degree of importance the rest placed on this line of business ranged from two considering it as very important, three as important, eight as fairly important, and six as possibly important.

The need to investigate contractors' management of tenders led the researchers to investigate the estimating and planning processes and the conditions of contract that are currently used. The research found that contractors expose themselves to more risks when working according to conditions of contract that restrict the powers of the engineer. The questionnaire results revealed that 14 out of 20 lending banks investigated the tender make up of the project. It also found that 18 of 30 contractors use in-house financial experts to study and handle their financial needs.

The research was then able to develop guidelines for lenders to help in the decision-making process and for borrowers to identify the areas that concern bankers most when lending to contractors (Shawa 1995). These guidelines were presented for validation at interviews with five contractors selected at random from Table 1, and with five bankers selected at random from Table 2. The interviews were conducted by the writers at the interviewees' offices. Each interviewee was presented with the list of guidelines relevant to his group with the conditions and summary for validation. All interviewees were satisfied with the guidelines.

The research's definition of project related finance, after disregarding the rejected three assumption numbers 4, 8, and 9, and accepting as a fair assumption number 7—that not all debts are guaranteed by the borrower—is as follows: "Project related finance is the means to bring together a complete package of financial commitment from the lending bank and certain guarantees from the borrower to execute a construction project through linking the loan repayments to the project's own cash flow."

## APPENDIX. REFERENCES

Shawa, H. H. (1995). "Project related finance for construction contractors in the United Arab Emirates, PhD thesis, Loughborough Univ., U.K.

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