FINANCE FOR NON-FINANCIAL CONSTRUCTION MANAGERS: EMPIRICAL ANALYSIS OF FINANCIAL VARIABLES THAT INFLUENCE ACQUISITION DECISION-MAKING PROCESS

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The ability of managers to assimilate financial data, integrate financial and accounting data into business operations and make informed financing decisions depend largely on the level of their financial proficiency. Construction managers with no proficiency in basic financial concepts in relation to business financing decision-making process are not able to create value for their firm. The paper identified the basic financial variables that affect corporate financing decision-making and examined the level of manager's financial proficiency in context of applications and the significance in the overall corporate financing decision-making process. Criteria such as ability to interpret financial information and ability to analyse financial data were found to be the most important factors necessary. The contribution of the paper is the presentation of operations directions about the ways construction managers can create action plans to improve their financial decisions through a deeper understanding and application of the financial variables.

Keywords: construction corporations, decision-making, financial variables, proficiency.

INTRODUCTION

Managers of business corporations of all kinds with no exception to construction corporations are under constant pressure to perform better and boost their financial results (Alan, 2005). This is true even if the financial results are good already as managers of companies are reminded everyday of the need to improve company profits; to manage cash flow efficiently, to keep stock levels down, to optimize available financial resources, to make sound financial decisions, to attain superb financial records, to avoid creating financial problems and obtain appreciable returns (Robbie, *et al.* 1993; Rouse, 2002). Moreover, in recent times, business and capital market environment is changing rapidly, financial markets are becoming global, competition is becoming more intense and the financial communication is becoming increasingly complex (Andreas, 2001).

As a result, there is a perceived need for construction managers to be alert, abreast with the requisite financial variables and make the right financial decisions. To be able to achieve this, construction corporations will need managers of substantial proficiency in managerial finance in order to make informed financial choices (Wilson

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and McHugh, 1990). According to Alan, (2005), business corporations, likewise, construction firms do not necessarily need more accountants and financial consultants in order to make prudent decisions; the problem is about managerial financial proficiency. The historical problem of managers financial proficiency is that they are not keen to know much about finance and its sophistications (i.e. profit and loss accounts, balance sheet, financial innovations, etc) (O'Regan, 2001; Alan, 2005). Instead, most construction corporations heavily rely on financial consultants and pay so much for the so-called "expert" financial advice while they can simply make sound decisions with little proficiency (Rouse, 2002).

Apparently, for a construction company to make significant growth, its managers should be in a better position to interpret and analyse historic financial information in order to be at competitive advantage (Adreas, 2001; O'Regan, 2002; Alan, 2005). Much is desired of construction managers; thus to be able to spearhead their corporations by maintaining standards, making informed financial choices, develop financing strategy and achieving corporate financial balance. Achieving this largely depends on the level of managements' financial proficiency (Robbie, *et al.* 1993), which are explored and presented in this paper. While there is a good indication of how firms make specific lease/buy decisions (Mukherjee, 1991), the factors that influence their overall financing decision-making are still not certain.

To fill this void, the paper offers an empirical analysis of the factors that influence firms' acquisition financial decisions. It then uses the results to examine the level of proficiency of construction managers and provides better perspectives for managers to be keen with these financial variables that directly drive acquisition decision-making. Primarily, among other objectives were; (i) to identify the financial variables that influence corporate financial decision-making process, (ii) determine the level of proficiency of management executives of construction corporations in those variables, (iii) to establish stylized facts on the significance of the variables in financial decision-making and (iv) examine the practical application of the variables by construction managers in order to provide the grounds for further research.

THEORETICAL UNDERPINNINGS OF ACQUISITION

Decision-making

The decision to start a business or expand an already existing firm by increasing the productive assets, involved an implicit decision to raise money capital in order to finance the growth (Wilson, 1990). According to McLaney (2005), acquisition financing decisions involve the determination of the optimal mix of the various sources of funds required for financing the assets of the firm. Given the different sources of funds, acquisition financing decisions imply two separate types of decisions. First, management must decide the optimal capital structure of the firm, that is, the optimal proportion of debt in its total capital (Modigliani and Miller, 1958). The capital structure is reflected in the firm's debt-equity ratio, (that is the proportion of debt to equity in the total assets of the firm) (Koutsoyiannis, 1982). Second, management must decide an optimal dividend payout ratio (the ratio of dividends to total earnings available to shareholders after payment of interest and corporate taxes). That implies the determination of the retention ratio, the proportion of earnings to be retained for financing investment projects that will yield increased earnings in future periods (Koutsoyiannis, 1982).

The acquisition decisions therefore involve the determination of a best possible debt equity ratio (capital structure decision) and optimal dividend-payout decision (retention-dividend policy) (Koutsoyiannis, 1982; Mwenda, 1993). Initially, there was an assumption that the project (i.e. acquiring capital equipment) had been appraised using some appraisal techniques and had passed those tests. That is, the acquisition was consistent with the firms' corporate objectives, economically sound and anticipated to yield an appreciable level of profit judged by profitability measures. There was also a derived assumption that management had passed the investment decision and that the investment decision did not impinge on the acquisition financing decision. According to Fawthrop, (1969), a decision to the method of financing one project will usually interrupt the decisions as to the financing of other projects, which the firm may wish to implement sometime in the future.

METHOD

This paper takes a different approach in considering the acquisition decision thus, to lease, to borrow or use equity capital. We first consider the factors that determine whether a firm uses equity or fixed financing to undertake acquisition investments. This approach is basically an extension of earlier works such as Bradley *et al.* (1984), Long and Malitz (1985) and Titman and Wessels (1988), which consider the empirical determinants of regular debt leverage. The focus is changed to consider the factors that determine financing alternatives. These factors are taken as those previously used in determining the firm's regular debt usage, (Adreas, 2001), Kanga and Long (2001) (Bradley *et al.*, 1984) Lewellen *et al.* (1976), Smith and Wakeman (1985).

Specifically, they are those used by Bradley *et al.* (1984) and also the work of Long and Malitz (1985). Both of those studies scaled the variables by the firms estimated market value. The market value according Kanga and Long (2001) is estimated as equity's market value plus the firm's reported long-term debt, which includes capital leases and the value of operating leases. At this point the paper reviews the factors that should favour a specific form of acquisition.

The method adopted was divided into three distinct phases, thus, (i) design of survey and sample characteristics; (ii) distribution and collection of questionnaires; and (iii) preparation prior to the analysis.

Data collection was mainly survey conducted on selected forty nine large construction firms in Ghana. In designing the questionnaire, efforts were made to ask questions, considering the background of contractors so to generate understanding and interest. Where appropriate, therefore, questions of similar studies (Wahab, 1996) were adopted. In order to achieve strong theoretical underpinnings, a number of factors had to be considered. First, financial variables applicable in making corporate financing decisions were advanced through literature. The variables were further grouped into two main categories with each category identified into sub-themes. Second, questionnaires were formulated in line with the study objectives to solicit empirical data. A draft of the questionnaire was discussed with three researchers in Ghana. The updated questionnaires were pre-tested with three contractors who had previously been involved in research programmes. The final version of the questionnaires was packaged into a booklet format as recommended by Dillman (1978). The sample frame for the questionnaires was drawn from a population of 49 large construction corporations registered with the Association of Building and Civil Contractors of Ghana (ABCCG). These contractors were selected because they were those that had

well-defined management set-ups where acquisition decisions were made at the corporate level. Notwithstanding, there were exceptions, thus most CEOs in the firms that were examined had veto authority to make acquisition decisions.

The way in which the survey questions were presented and administered would invariably be affected in terms of quality of the responses. Therefore, it was imperative to ensure that the right questions were asked, well understood and asked in the right way and the right respondents handled it (Wahab, 1996). As earlier discussed, most CEOs in the respondent firms were very instrumental when it came to making corporate financing decision. On this account, the researcher accordingly disseminated the questionnaires to targeted respondents personally and was given some time to be collected. A follow-up visits to the respondents to remind them of the agenda concerning the completion of the questionnaires was made via telephone calls, emails and personal visits. There was a certain amount of groundwork that had to be accomplished before the analysis was performed on the data. Before the analyses took place, the data was placed into proper format. The data was gathered and processed into a suitable form for the analysis (thus, sorting, editing, coding, etc). Descriptive statistics, chi square test and explanation building analytic techniques were employed to present and analyse the data.

DATA PRESENTATION AND ANALYSIS OF RESULTS

The dataset

The dataset was derived from a survey conducted on 49 large construction firms operating in Ghana. The firms were selected based on their size. The firm size was measured in terms of annual total turnover of the firm (thus, a turnover between ¢1-10 Billion) and real total assets of more than ¢10 billion Cedis. All firms with characteristics below this category were not included in the survey. More than 99% of the firms included in the dataset are not traded on the Ghana stock market. The dataset provides information on companies over a five-year period from 2001-2006. The firms in the dataset operate in the mainly the construction economy. Firms that did not have any financial systems in place were not considered in the survey. Similarly, firms that did not have complete records on assets, profitability, and demonstrates substantial familiarity in the application of financial variables, which we included in the survey, were also dropped during the data sorting and subsequent analysis.

Presentation of data

Certain indicators were established to measure the variables investigated, which included; level of proficiency, level of application in practice and level of practical significance. Out of forty nine questionnaires despatched to the targeted construction firms, thirty three were returned and the twenty nine that were fully completed were used in the analysis. In effect, the response rate that was used in performing the analysis was 71%. The apparent high response rate, comparable to that registered in the study by Eyiah and Cook (2003), which had a response rate of 61%, can be attributed to the technique employed in distributing the questionnaires. The analytical procedures employed were aimed at establishing the level of proficiency, application and practical significance of the financial variables under investigations. Frequencies distribution based on actual responses are presented. Weights were assigned to level of agreement attached to variables on a five-point scale. The mean rating of the variables were obtained using the sum total of point obtained and the number of responses for that particular variable (Everritt and Dunn, 1991: Lynn, *et al.* 2001).

Representative results

Table 1 presents means and standard deviations of the main variables that influence acquisition-finance decision-making process, for all firms in our sample. We can see that, without holding other factors constant, the mean values of financial statements variables are generally larger. Surprisingly, the mean values of other variables such as that of profitability, activity, liquidity and gearing seem to be almost the same and also larger than the mean values of trend and common size and investor ratios. Those variables with higher mean values are more likely to be significant than their counterparts. This preliminary descriptive analysis of our data shown in preceding discussions suggests that construction managers of large construction firms in Ghana have basic financial proficiency and that the financial variables are prevailing in acquisition decision-making. In the sections that follow, we will formally test whether this is the case using chi-square test and factor analysis.

Table 1: Descriptive statistics of the financial variables

	N	Min	Max	Mean	Std. Deviation
Financial Statements					
The Balance sheet Statement	29	1.00	5.00	4.1379	1.09297
The Income Statement	29	1.00	5.00	4.1724	1.07135
The Statement of Cash flow	29	1.00	5.00	4.2069	1.08164
The Statement of Retained Earnings	29	1.00	5.00	3.7586	1.32706
Profit/Loss Statement	29	1.00	5.00	4.1379	1.02554
Statement of Auditors Report	29	1.00	5.00	3.8621	1.27403
Trend and Common Size Analysis					
Financial Trend Analysis	29	1.00	5.00	2.9655	1.72135
Common Size Analysis	29	1.00	5.00	2.8621	1.66313
Profitability Ratios					
Return on Equity Profitability	29	1.00	5.00	3.4828	1.52645
Return on Asset Profitability	29	1.00	5.00	3.4828	1.45457
Gross Profit Profitability	29	1.00	5.00	3.7241	1.36006
Net Profit Profitability Ratios	29	1.00	5.00	3.8276	1.36458
Operating Profit Profitability	29	1.00	5.00	3.5862	1.47642
Activity Ratio					
Net Asset Activity Ratios	29	1.00	5.00	3.6897	1.46637
Stockholding Activity Ratios	29	1.00	5.00	3.2414	1.61809
Average Payment Activity	29	1.00	5.00	3.2759	1.62341
Liquidity Ratios					
Current Ratio Liquidity Ratios	29	1.00	5.00	3.6552	1.47057
Quick Asset Liquidity Ratios	29	1.00	5.00	3.5172	1.54967
No Credit Period Liquidity	29	1.00	5.00	2.9310	1.64601
Acid Test Liquidity Ratios	29	1.00	5.00	3.2069	1.71920
Financial Leverage/Capital Gearing Ratios					
Total Debt Gearing Ratio Analysis	29	1.00	5.00	3.2759	1.66683
Debt to Equity Gearing Ratio Analysis	29	1.00	5.00	3.3448	1.56470
Long Term Debt Gearing Ratio Analysis	29	1.00	5.00	3.2414	1.59587
Time Interest Gearing Ratio Analysis	29	1.00	5.00	3.0000	1.75255
Investor/Market Value Ratios					
Earnings Per Share Investors Ratio Analysis	29	1.00	5.00	2.8966	1.79970
Price Earnings Investors Ratio Analysis	29	1.00	5.00	2.8621	1.76724
Market to Book Investors Ratio Analysis	29	1.00	5.00	2.8276	1.79422

Similarly, Table 2 presents frequency analysis of the perceived need of proficiency in the financial variables examined. Respondents were asked in the survey to indicate whether financial proficiency is necessary for management executives. Interestingly, the study observed that, a high number of the respondents (86.2%) considered financial proficiency for management executives of construction corporations as very necessary, and would want their respect companies to develop training schemes to boost their proficiency in managerial finance. Fortunately, high percentage (89%) of the respondents indicated that financial proficiency can be acquired on the job through the firm's regular training schemes via conferences, seminars, workshops, forums, short courses. Contrary, to other business sectors such as banks, airline and manufacturing, it was observed that construction companies in Ghana had no policy framework for personnel development in many areas such as finance and information technology. Perhaps these coupled with our other findings about managerial finance will help academics and practitioners alike understand the pervasive relation between financial proficiency and corporate practices in order to be well positioned in financial decision-making process. Aside, the earlier assertion on the techniques of acquiring managerial financial proficiency, our research suggests that construction corporations should establish mini-libraries in their offices, stocked with financial materials and archives viz books, journals, magazines, news letters, financial reports, etc where managements could easily have access to them for references. Routine financial training programmes should also be encouraged to build the capacities of stakeholders involved with financial decision-making

Table 2: Frequency Analysis of Financial proficiency of Management Executives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes, very necessary	25	86.2	86.2	86.2
	No, not necessary	1	3.4	3.4	89.7
	Quite necessary	3	10.3	10.3	100.0
	Total	29	100.0	100.0	

A further manifestation of the desperate need for managerial finance proficiency was high among CEOs, Project Managers, Quantity Surveyors, Accountants and Human Resource Managers. The paper observed that, these executives were very influential in corporate financial decision-making process in the firms examined. Though, the results of the respondents' financial proficiency were impressive, it is unfortunate however, most of them did not take keen interest in their application (see Table 8). Tables 3 – 7 present frequency analysis of the financial education acquired by top management executives mostly involved with financial decision-making. Apparently, it can be inferred from the results in Table 3 that 62.1% of the respondents CEOs have acquired some sort of financial education or training.

Table 3: CEOs Financial Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	11	37.9	37.9	37.9
	Yes	18	62.1	62.1	100.0
	Total	29	100.0	100.0	

Unfortunately less than 50% of the respondents Project Managers and HR Managers have acquired some financial training.

FURTHER EMPIRICAL RESULTS

With the data identified, chi square test was used to validate the statistical significance of the variables in the domain of management proficiency, application of the variables in practical context and the significance of the variables in the decision-making process. Initially, three assumptions formed the null hypotheses. First, construction executives are not proficient in the basic financial variables. Second, they frequently use the financial variables in practical context. Third, financial variables play a significant role in the acquisition decision-making process. Table 4 presents the results of the analysis using chi-square with predicted significant values of 0.05. At 0.05 confidence level, coefficient values that were not in this range were rejected. Column 1 of Table 4 demonstrates the results of the chi-square test performed in determining the significance of management's proficiency in the control variables. The control variables were found to be significant, with the expected signs. Apparently, variables that have values below 0.05 suggest that management executives are proficient and therefore, reasonable to reject the null hypothesis. Surprisingly, with few exceptions, the results in column 2 of Table 4 also suggest contrary opinion to the null hypothesis as most of the values showed signs above the significant range for acceptance.

Table 4: Chi-Square Significance Test

Financial Variables	**Chi-Square Coefficient Values X^2**		
	Proficiency	**Application**	**Significance**
Financial Statements			
The Balance sheet Statement	0.000	0.081*	0.014
The Income Statement	0.000	0.050	0.003
The Statement of Cash flow	0.000	0.064*	0.002
The Statement of Retained Earnings	0.012	0.370*	0.000
Profit/Loss Statement	0.000	0.511*	0.000
Statement of Auditors Report	0.006	0.824*	0.000
Trend and Common Size Analysis			
Financial Trend Analysis	0.089*	0.021	0.000
Common Size Analysis	0.153*	0.370*	0.018
Profitability Ratios			
Return on Equity Profitability Ratio	0.175*	0.016	0.003
Return on Asset Profitability Ratio	0.067*	0.089*	0.008
Gross Profit Profitability Ratios	0.029	0.021	0.000
Net Profit Profitability Ratios	0.012	0.029	0.000
Operating Profit Profitability Ratios	0.059	0.575*	0.000
Activity Ratios			
Net Asset Activity Ratios Analysis	0.038	0.012	0.000
Stockholding Activity Ratios	0.226*	0.051	0.012
Average Payment Activity Ratios	0.257*	0.572*	0.050
Liquidity Ratios			
Current Ratio Liquidity Ratios	0.211*	0.038	0.012
Quick Asset Liquidity Ratios	0.067*	0.518*	0.012
No Credit Period Liquidity Ratios	0.370*	0.175*	0.044
Acid Test Liquidity Ratios Analysis	0.057	0.257*	0.001
Financial Leverage/Capital Gearing Ratios			
Total Debt Gearing Ratio Analysis	0.170*	0.038	0.000
Debt to Equity Gearing Ratio	0.328*	0.059	0.000
Long Term Debt Gearing Ratio	0.370*	0.328*	0.000
Time Interest Gearing Ratio Analysis	0.018	0.089*	0.002
Investor/Market Value Ratios			
Earnings Per Share Investors Ratio	0.009	0.067*	0.016
Price Earnings Investors Ratio	0.021	0.017	0.016
Market to Book Investors Ratio	0.006	0.055	0.012

Significant at the 0.05 level for one-tailed test. *Null hypothesis rejected.

This is quite controversial, in the sense that it raises several questions regarding the context within which financial decisions are taken by construction executives. Further, the fact that the practice of managerial finance is not given any serious consideration could be an underlying cause of many financial-related anomalies in many construction firms in Ghana. It is therefore safe to say that most of the fatal occurrences of financial recess, acute growth and eventual liquidation of some construction companies in Ghana are largely attributed to the lack of adherence to the application of these variables in the context of financial decision-making, as most often, managers make ill-informed financial.

Similarly, the results are reassuring in the sense it creates practical impressions of the realities and provides a new thinking into how construction executives view these variables. Furthermore, in column 3 of Table 4, all the variables showed strong coefficient values of less than 0.5. The interpretation of this observation is that, any singled-out variable from the continuum of financial variables is crucial in the acquisition financial decision-making process. For that matter, it is imperative that management's take keen interest in their application.

CONCLUSIONS

The empirical survey presented here is both reassuring and puzzling. For instance, it is reassuring that the financial variables examined are dramatically more important now as a means of equipping construction executives with the requisite skills to articulate strategy and financial performance with shareholders, accountants and financial managers in their firms and understand the impact of financial decisions on firm's profitability, efficiency and riskiness information. However, it is surprising that though construction executives have basic financial proficiency they do not apply those principles in the decision-making process. Interestingly, they relied extensively on "Rule of Thumb" without evaluating the fatal risks consequences involved. On other hand, they increase the company liabilities by hiring the services of rather expensive external financial consultants. The study observed that, perhaps the underlined financial principles are valid descriptions of what firms should do but companies ignore the theoretical advice. In conclusion, this paper empirically tested the significance of the main financial variables that influence acquisition decision-making. The study has indeed provided the basis for further research by establishing a set of stylized facts on corporate financial proficiency and suggests additional research to investigate and design the framework for financial training programmes for construction executives.

REFERENCES

Alan, C. (2005) "Finance training can be fun and effective", Journal of Industrial and Commercial Training, Vol. 37 No 7, pp. 355-360, Emerald Group Publishing.

Andreas G. C. (2001) "Finance for Non-Financial Managers" Department of Public and Business Administration, University of Cyprus, Greece.

Bradley, M., Jarrell, G.A. and Kim, E.H. (1984) "On the Existence of an Optimal Capital Structure", Journal of Finance Vol. 39, pp.899-917.

Dillman, D.A (2005) "Mail and Internet Surveys: The Tailored design Method", John Wileys & Sons Publications.

Everritt, B.S.and Dunn, G. (1991) "Applied Multivariate Data Analysis", EAP .

Eyiah, A.K. and Cook, P. (2003) "Financing small and medium-scale contractors in developing countries: a Ghana case study", Construction Management and Economics, Vol. 21, pp.357-3.

Fawthrop, R.A (1969) "Criteria for Comparative Evaluation, Selection and Integration of Methods of Financing Industrial Capital Expenditure", A Doctoral Thesis submitted in partial fulfilment of the requirements for the award of Doctor of Philosophy of Loughborough University, UK.

Kanga, S. and Long, M.S. (2001) "The fixed payment financing decision to borrow or lease", Review of Financial Economics **10**(2001) 41-55 .

Ketz, J. E. (2003) "Hidden Financial Risk: Understanding Off-Balance Sheet Accounting, Key concept in accounting and finance, New York: John Wiley.

Koutsoyiannis, A. (1982) "Non-Price Decisions", the firm in a Modern Context", The Macmillan Press Ltd., London.

Lewellen, W. G., Long, M. S., and McConnell, J. J. (1976) Asset leasing and competitive capital markets. Journal of Finance, 787 ± 798 (June) .

Long, M. S. and Malitz, I. B. (1985) "Investment patterns and financial leverage" In: B. M. Friedman (Ed.), corporate capital structures in the United States. .

Lynn, P., Beerten , R., Laiho, J. and Martin, J. (2001) "Recommended Standard Final Outcome Categories and Standard Definitions of Response Rate for Social Surveys", Colchester, Essex: The Institute for Social and Economic Research.

McLaney, E. (2005) "Business Finance: Theory and Practice, 7th Edition.

Modigliani, F. and Miller, M. (1958) "The Cost of Capital, Corporate Finance and the Theory of Investment", American Economic Review.

Mukherjee, T. K. (1991) "A survey of corporate leasing analysis. Financial Management" pp 96- 107.

Mwenda, A. (1993) "Credit Rationing and Investment Behaviour under Market Imperfections", Kompendiet-Göteborg, .

O'Regan, P. (2002, 2005) "Financial Information Analysis", John Wiley & Sons .

Robbie, M., Coulbeck, N.and Moulds, T. (1993), "Lending Packages for Small and Medium Sized Companies, Croom Helm Publications Ltd, Canberra & London.

Rouse, C.N. (2002) "Bankers Lending Techniques", Financial World Publishing, .

Smith, C. W. and Wakeman, L. M. (1985) Determinants of corporate leasing policy. Journal of Finance, 895-908.

Titman, S. and Wessels, A. (1988) "The determinants of capital structure choice", Journal of Finance, 1 -19.

Wahab, I.A. (1996) "Financing the Growth of Small Manufacturing Firms" A Doctoral Thesis submitted in partial fulfilment of the requirements for the award of Doctor of Philosophy of Loughborough University, UK.

Wilson, R.M.S.and McHugh, G. (1990, 1993) "Financial Analysis: A Managerial Introduction", Cassel Educational Ltd, London.