Capital structure and return on capital employed of construction companies in Nigeria

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Abstract: This study examined the impact of capital structure on return on capital employed of construction firms in Nigeria. The data for the study was obtained from the annual report and accounts of the sampled firms. The study employed panel data analysis and pooled regression, fixed-effect and random-effect estimation techniques for the analysis and Stata 12.0 was used. The study concluded that capital structure has a negative impact on return on capital employed of the sampled construction companies in Nigeria. The study recommends that the managers of the construction companies should be careful while using debt as a source of finance; they should try to finance their activities with retained earnings and use debt as a last option.

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1   Introduction

Capital structure became a matter of great debate after Modigliani and Miller (1958), who documented that capital structure, is independent of firm performance. Later on, a great debate in this area started and a lot of research has been conducted in this area and it is still continued. Vicente (2001) opined that the combination of debt and equity used to finance a firm's projects is referred to as capital structure, otherwise referred to as, financial structure, which is the means by which an organisation is financed. However, financing of all firms is done by equity, debt or hybrid security. Firm's capital structure relies upon the size of the composition of debt or equity that is used by it to be operational. One of the main factors that could influence the firm's performance is capital structure (Tian and Zeitun, 2007).

The term performance on the other hand has been interpreted by different authors in different ways. It refers to the efficient and effective use of resources by an organisation for the accomplishment of its objective or goal (increase in the following: share price, sales, market share, sustainable profitability, net present value, earnings, generating cash flows, risk-taking, leverage and demand of its product or service). According to Aluko (2003), performance is the execution or accomplishment of work, tasks or goals to a certain level of desired satisfaction and that organisational performance is defined in terms of the ability of an organisation to satisfy the desired expectations of three main stakeholders comprising of owners, employees and customers. Questions related to the choice of financing (debt versus equity) have increasingly gained importance in accounting research. Capital structure has gained a wide attention in the developed nations but remained neglected in the developing nations as a result of the developing nations placing little importance to the role of firms in economic development (Bhaduri, 2002). Capital structure literatures have shown conflicting results among researchers.

Some management researchers have viewed capital structure decisions as arising from the preferences of various stakeholders such as managers (Barton and Gordon, 1988), board of directors (Stearns and Mizruchi, 1993) and institutional investors (Chaganti and Damanpour, 1991). While these studies have definitely contributed to some understanding of the linkages between strategic management and capital structure, they have largely ignored some basic issues confronting researchers and managers alike, namely: Does it matter how firms finance their assets? And do different modes of financing make a difference? However in Nigeria, determination of the actual effect a firm's capital structure has on its financial performance has been a major challenge among researchers. Particularly, specifying what capital mix seems to optimise firms' values has been a difficult task to achieve. There have been a limited number of studies in Nigeria that have examined the firm's choice of capital structure and its financial performance, among these studies are the study conducted by Onaolapo and Kajola (2010) who examine the impact of capital structure on firm's performance using sample of 30 non-financial firms listed on the Nigerian Stock Exchange during the seven year period of 2001–2007. Panel data for the selected firms are generated and analysed using ordinary least squares (OLS) as a method of estimation. The result shows that a firm's capital structure surrogated by debt ratio has a significantly negative impact on the firm's financial measures (return on asset and return on equity).

Also, Babalola (2012) examines an optimal capital structure to maximise the performance of the selected firms under the same systematic risk. The study investigates the relation between return on equity (ROE) and the capital structure for a sample of ten firms from 2000 to 2009. The study uses regression analysis technique and concluded that there is a strong curvilinear relation between ROE and the debt-to-assets ratio. The result signifies that the manufacturing industry's capital structure in Nigeria is consistent with trade-off theory, and the results are consistent with the hypothesis that the corporate performance is a nonlinear function of the capital structure. Although, studies were conducted on the impact of capital structure on firms' performance in Nigeria, but to the best of the researchers' knowledge, none of the studies was conducted in the Nigerian construction industry. To this end therefore, this study basically attempts to examine the impact of capital structure on return on capital employed (ROCE) of listed construction firms in Nigeria.

The paper is thus organised into five sections. Section 1 which is this section is the introduction. Section 2 which is the next section, reviews related literature on the subject matter of the study. Section 3 discusses the methodological issues of the paper, while Section 4 presents and discusses the results obtained from the data generated for the study and finally, Section 5 gave the conclusion of the paper.

2 Literature review

2.1 Concept of capital structure

Capital structure is the firm's various sources of funds used to finance its overall operations and growth, or the combination of a company's long-term debt, specific short-term debt, common equity and preferred equity. Debt comes in the form of bond issues or long-term notes payable, whereas equity is classified as common stock,

preferred stock, or retained earnings. Short-term debt such as working capital requirements also is considered part of the capital structure (Titman and Wessels, 1988). Capital Structure is also referred to as the ratio of different kinds of securities raised by a firm as long-term finance. Himmelberg (1998) opined that the proportion of short-term and long-term debt considered in analysing a firm's value is capital structure, and that when people refer to capital structure, they most likely are talking about a firm's debt/equity ratio, which provides insight into how risky a company is. Usually a company financed heavily by debt poses greater risks because it is highly leveraged. However, Brigham and Gapenski (1996) argue that an optimal capital structure can be attained if there exist a tax sheltering benefits provided an increase in debt level is equal to the bankruptcy costs. They suggest that managers of the firm should be able to identify when the optimal capital structure is attained and try to maintain it at that level. This is the point at which the financing costs and the cost of capital (WACC) are minimised, thereby increasing firm value and performance.

Pandy (1999) differentiated between capital structure and financial structure of a firm by affirming that the various means used to raise funds represent the firm's financial structure, while the capital structure represents the proportionate relationship between long-term debt and equity. Therefore, a firm's capital structure is described as the capital mix of both equity and debt capital in financing its assets. However, whether or not an optimal capital structure exists is one of the most important and complex issues in corporate finance. According to Pandey and Singh (2015), capital structure refers to the relationship between various long-term sources of financing such as debenture, preference share capital and equity capital including reserves and surplus.

2.2   Debt and equity as alternate sources of capital

In the presence of uncertainty, bounded rationality, and opportunism, contracts that completely safeguard an investment cannot be designed (Williamson, 1975). This leads to organising costs for the firm, as is the case for other economic activities. These organising costs are a function of the institutional and environmental constraints, (Williamson, 1975; Yarbrough and Yarbrough, 1988). The choice between two alternate structures will depend on the comparative costs for organising a particular transaction, for instance, financing a particular investment. As Williamson (1975) has argued, it is the characteristics of assets under consideration that affect costs under alternate capital structures. The variation in the benefits of the two instruments and in their ability to monitor and evaluate managerial actions implies that debt and equity can be considered as alternate capital structures (Berglof, 1990; Williamson, 1988).

A firm has the option to choose either one when financing a new investment. However, Jensen and Meckling (1976) opined that, the debt-to-equity ratio, therefore, is the result of transactions with potential debt-holders and equity-holders. These transactions come about with the formation of (explicit or implicit) contracts that delineate the benefits and recourse available to the suppliers of finance. The benefits available represent the property rights due to their claims over the return streams (from the assets). The recourse available is in the form of their control rights over managerial actions. The financing structures of debt and equity can be compared with respect to the characteristics of control and property rights. The debt instrument carries with it fixed rules and covenants that usually monitor the lending process. The repayment schedule of

the principal loan amount and the interest payments are stipulated in the contract, with debt-holders having primary claim over the firm's cash flows from the assets.

The firm is often required to meet liquidity tests to ensure that the lender's investment is not jeopardised. These characteristics imply that debt has strong property rights, making it similar to the market exchange mechanism as claimed by Williamson (1991). Equity owners, on the other hand, have a residual claimant status over the cash flow from asset earnings and asset liquidation. That is, they obtain the cash flows that are left after paying off more senior claims such as debt. Thus, equity-holders have weaker property rights, similar to hierarchical control (Williamson, 1991). The control rights of the two instruments are, however, reversed. The equity contract is not for a fixed period but runs for the life of the firm. The board of directors is present to closely monitor and evaluate managerial actions, ensuring that the investment of equity-holders is protected. The board has the authority to monitor internal performance, approve significant decisions, decide on managerial compensation, and replace managers if it deems so necessary (Fama and Jensen, 1983).

In addition, Hennart (1993) argued that the instrument of equity emphasises continuous behaviour control and providing equity-holders with stronger control rights. Debt-holders are limited in their ability to interfere with firm operations so long as the contractual stipulations are satisfied. That is, they have much lesser ability to control managerial actions in ensuring that assets are utilised efficiently. They can step in only when a firm defaults on its repayment schedule or not meet its promised obligations. Hence, debt is characterised by weaker control rights. The preceding discussion suggests that debt and equity are alternate capital structures that can be used to finance a firm's assets; they possess widely different characteristics with respect to the benefits provided to the supplier of finance, and the rights afforded to the supplier in ensuring that the investment is utilised efficiently. These characteristics indicate that debt is more akin to the market system of organising, whereas equity is similar to the hierarchical system. The differences in control and property rights suggest that debt and equity may be suitable for financing different types of investments.

2.3 Asset specificity and the debt/equity choice

As debt and equity represent two ways of organising the financial structure of a firm, and they possess differential abilities, specificity of the assets is likely to be a determining factor in the choice between the two. However, debt financing is suitable for low specificity assets, and equity is preferred when the level of specificity is high. Firm assets are utilised to generate a stream of cash flow over time. Suppliers of finance desire that these assets generate an adequate rate of return, defined by the interest rate on debt or the cost of equity capital.

Jensen and Meckling (1976) suggested that, due to several reasons, however, it is possible that this may not be the case. Firm managers may seek to maximise their own benefits leading to increased agency costs and decreased firm value. Some actions may also benefit old equity-holders at the expense of new debt-holders as in the 'asset-substitution' problem (Myers, 1977). Finally, other decisions may simply reflect poor managerial judgements. Any or all of these circumstances are likely to lead to a downward deviation from the expected returns. When the suppliers of finance observe signs of the beginning of any these circumstances, it is to their advantage to interact with

managers and prevent value reduction. This implies the need for adaptation between these two economic agents. Market modes of governance, such as debt, are proficient in price-based adaptation, whereas hierarchical structures, such as equity, are superior for adaptation through coordination (Williamson, 1991). The complex activity of coordination, however, increases the bureaucratic cost of the hierarchical capital structure.

Leland and Pyle (1977) and Ross (1977) propose that managers will take debt/equity ratio as a signal, by the fact that high leverage implies higher bankruptcy risk (and cost) for low quality firms. Since managers always have information advantage over the outsiders, the debt structure may be considered as a signal to the market. Ross's model suggests that the value of firms will rise with leverage, since increasing leverage increases the market's perception of value. Suppose there is no agency problem, i.e., management acts in the interest of all shareholders. The manager will maximise company value by choosing the optimal capital structure; highest possible debt ratio. High-quality firms need to signal their quality to the market, while the low-quality firms' managers will try to imitate. According to this argument, the debt level should be positively related to the value of the firm.

2.4   Determinants of capital structure

The factors determining capital structure were pointed out by the following empirical studies.

Oliver and Mefteh (2010) investigated the impact of industry sentiment (investor confidence and manager industry confidence) of all French firms listed on the Compustat database with at least three years of data over the years 1995–2004. Descriptive statistics, correlation and OLS regressions were used as techniques for data analysis. The study results show that industry confidence and investor confidence are negatively related to leverage and that the unique component of manager industry confidence is positively related to leverage. More so, collateral and firm size determine leverage positively, while dividend and profitability determine leverage negatively. In addition, Lemma and Negash (2011) examined the antecedents of capital structure of 152 firms listed on the Johannesburg Securities Exchange for the period 2002–2008. A two-step procedure consisting of exploratory factor analysis and multiple regressions were employed as techniques for data analysis. The study documented that capital structure is negatively influenced by such factors as profitability, liquidity, intangible-unique-growth opportunities, and business risk; it is positively affected by industry factors.

Afolabi (2014) examined the role of bank ownership structure on capital structure of 244 banks across 44 countries. The banks were classified across the countries with geographical regional dummies indicating if the banks are located in Asia, Africa and Latin America (the reference category being OECD countries). The study documents that family-owner managed firms tend to have a lower debt and that excessive control right of the controlling owner may significantly increase bank leverage. Moreover, Wellalage and Locke (2014) investigate the determinants of capital structure of 120 unlisted small businesses in New Zealand for the period 1998–2008. Dynamic panel GMM estimation technique was employed for the analysis. The results of the study indicated that managerial ownership, firm characteristics and industry are important determinants of capital structure.

Pandey and Singh (2015) investigated the determinants of capital structure by using literature review of the research being done, both in India as well as internationally, in the last one and a half decade. The study concluded that business risk, corporate tax rate, cost of debt, debt serving capacity, dividend payout ratio, firm age, firm size, growth opportunities, liquidity, non-debt tax shields, profitability, tangibility and uniqueness are the main determinants of capital structure. More so, Belanes (2015) examined the differences between Islamic and conventional banks, with a particular focus on the determinants of their capital structure. The sample for the study includes panel data of 44 Islamic and 66 conventional banks operating in MENA region (Bahrain, Egypt, Kuwait, Malaysia, Qatar, Saudi Arabia and United Arab Emirates) for the period that spans from 2005–2010. Descriptive statistics, univariate, discriminant analysis and binary logistic regression were employed as techniques for data analysis. The study provided empirical support for the fact that Islamic banks, in contrast to their conventional peers, rely more on their own equity rather than on external finance including loss-profit-sharing deposits. And that Islamic and conventional bank can be differentiated on the basis of assets tangibility and dividend payout and not in terms of profitability, asset liquidity and credit default. Among these factors, only profitability and size influence the equity-to-asset ratio in both kinds of banks.

Tahir et al. (2016) investigated the major determinants of debt to equity mixture of 17 banks which are listed on the Karachi Stock Exchange (Pakistan) for the period 2003–2013. Descriptive statistics, correlation and multiple regressions were employed as techniques for data analysis. The findings of the study indicated that various internal (bank specific) and external (industry specific) factors are contributing towards the ultimate determination of leverage decision of the firms over the period of the study and that size of the firm, return on assets (ROA), return on equity (ROE) and fixed asset tangibility (FAT) are the major determinants of leverage decision. Similarly, Rastogi and Mazumdar (2017) investigated the impact of financial restructuring on capital structure of 91 firms in India for the period 2000–2014. Pre- and post-admission data of firms subjected to financial restructuring are compared using paired sample t-test, while fixed effect panel regression model is used for the analysis. The empirical results show that financial restructuring by itself is not a reason enough for leverage to increase over a period of the study. Other factors like profitability, tangibility, growth opportunity and firm size play important roles as well. Moreover, Khasawneh and Staytieh (2017) examined the impact of foreign ownership on capital structure and the impact of foreign ownership on firms' value in the non-financial listed companies on the Amman Stock Exchange, taking into consideration the effects of the sector to which the firm belongs. Panel data using Driscoll-Kraay approach to resolve the heteroskedasticity problem of the fixed effect techniques are used. The empirical results revealed a significant negative relationship between foreign ownership and all three measurements of capital structure; although foreign ownership has the largest effect on the short-term market leverage relative to both long term and total market leverage. The sector of the firms' matters and especially when it comes to the impact of the services sector, it is found that the foreign ownership impact is always statistically significant, although it has a lower impact for the industrial firms. A strong significant positive relationship between foreign ownership and firms' value is also found, and the sector of the firms is found to be an important variable in the firm's value determination.

Through the review of literature on capital structure determinants, size, growth opportunity, tangibility of assets, profitability, business risk, non-debt tax shield, age of the firm, dividend payout ratio, liquidity, corporate tax rate, uniqueness, debt service capacity, cost of debt are the major important determinants of capital structure.

2.5   The concept of firm performance

In business, the analysis of performance whether financial, production, marketing (even managerial), or general activity is very necessary because the outcome of the very present decisions lie in the projection of the future. This however, begins with the evaluation of the past prevailing situation with a view to establish a basis for future projection. Principally, the unit evaluated is the organisation seeking to make decisions, but this is often not done in isolation. The concept of performance therefore cuts across all spheres of operation within and outside the organisation. For this reason, many scholars have viewed it differently. Available literatures envies that most writers and researchers have not bothered to proffer a concise definition of the term performance. According to Uboh (2005), performance can be grouped into two basic types; those that relate to results, output or outcomes such as competitiveness, profit and those that focus on determinants of results such as prices or products. Curristine (2005) in Ilesanmi (2011) defines performance as the yield or results of activities carried out in relation to the purposes being pursued. Its objective is to strengthen the degree to which organisation achieve their purposes.

Dauda (2010) highlighted that organisation performance is determined by the demand for its product or services. Many organisation put in place methods and strategies that could enabled them attract customers and improved the quality and quantity of their product. However, from the above definitions it can be seen that, performance in business setting means the extent of which set objectives has being or is being met. This implies that the resultant outcome of the firm's effort in derivatives as well as those aspects of the firm's cultures which indicates its ability to survive or its disposition to avail itself of further opportunities.

2.6   Empirical studies on capital structure and firm performance

Considering the significance and importance of capital structure to organisations, many studies have been conducted in some developed and developing countries with respect to the impact of capital structure on firm performance. These studies include Chou and Lee (2007), Akintoye (2008), Memon et al. (2009), Onaolapo and Kajola (2010), Chowdhury and Chowdhury (2010), Nimalathasan and Valeriu (2010), Pratheepkanth (2011), Sang and Heng (2011), Adeyemi and Oboh (2011), Iorpev and Kwanum (2012), Babalola (2012) and Uwalomwa and Uadiale (2012) to mention but few. For instance, Chou and Lee (2007) investigated the relationship between return on equity (ROE) and the capital structure for a sample of 37 non-financial industries in Taiwan from 1987 to 2007. The study use descriptive statistic and regression analysis as methods of data analysis and found that the non-financial industry's capital structure of Taiwan is consistent with trade-off theory, and the results are consistent with the hypothesis that the corporate performance is a nonlinear function of the capital structure. Also, Akintoye (2008) examined the sensitivity of performance indicators to turnover, which is a measure of capital structure, of the selected food and beverages companies in Nigeria. The study use

ratios and simple percentage as method of data analysis and documented that irrespective of the dividend policy adopted by an organisation, the rate of change in capital structure is a major influence on what organisations' behaviour is likely to be. In addition, Memon et al. (2009) investigated the impact of capital structure on firm financial performance in textile sector of Pakistan. The data was collected from the financial statements of 141 textile firms from 2004–2009. Return on asset (ROA) is used as a proxy measure of firm's performance and size, tangibility, debt to equity ratio, amount of annual tax, growth of firm and risk associated with business entity are considered as the determinants of capital structure. Log linear regression model has been used to analyse the impact of capital structure on firm performance. The results indicated that all the determinants of capital structure are significant and the findings suggest that Pakistan textile firms which are large in size are under performing and operating below the economies of scale. Moreover, the textile firms possess high amount of fixed assets which leaves a negative impact on their performance. It was suggested that financial analysts and managers should emphasise on the optimum level of capital structure and efficient utilisation and allocation of resources. This will help them to achieve the targeted level of productive efficiency in textile sector of Pakistan.

So also, Onaolapo and Kajola (2010) examined the impact of capital structure on firm's financial performance using sample of 30 non-financial firms listed on the Nigerian Stock Exchange during the seven-year period, 2001–2007. Panel data for the selected firms are generated and analysed using OLS as a method of estimation. The result shows that a firm's capital structure surrogated by debt ratio (DR) has a significantly negative impact on the firm's financial performance measured by return on asset (ROA) and return on equity (ROE).

Furthermore, Chowdhury and Chowdhury (2010) empirically investigated the influence of debt-equity structure on the value of shares given different sizes, industries and growth opportunities with the companies incorporated in Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE) of Bangladesh. The study use secondary data collected from the financial statements of 77 companies from four different dominant sectors of Bangladesh capital market (Pharmaceuticals and chemicals, fuel and power, food and engineering industry) for the period from 1 January 1994 to 31 December 2003. The study use descriptive statistics, correlation analysis, cross sectional time series fixed effect model, cross sectional regression analysis and time series analysis to analyse available data. The study result shows that there is a strong positive correlation between debt-equity structure and firm value when stratified by industry. And that maximising the wealth of shareholders requires a perfect combination of debt and equity, whereas cost of capital has a negative correlation in this decision and it has to be as minimum as possible. Moreover, Nimalathasan and Valeriu (2010) examined the impact of capital structure on profitability of listed manufacturing companies in Sri Lanka. Debt equity ratio was used as proxy for capital structure while gross profit, operating profit and net profit ratios was used as measures of profitability. The data was analysed using correlation analysis and the result revealed that capital structure is positively and strongly associated to profitability. Pratheepkanth (2011) examined the relationship between capital structure and companies performance of firms listed on the Colombo Stock Exchange of Sri Lanka for the period 2005–2009. Debt to equity ratio was used as proxy for capital structure while gross profit, net profit, return on asset and return on investment/return on capital employed were used as proxy for

performance. Descriptive statistics, correlation analysis and ANOVA were used to analyse the data collected. The study result shows that there was negative relationship between capital structure and financial performance. Similarly, Sang and Heng (2011) investigated the relationship between capital structure and corporate performance of construction companies which are listed in Main Board of Bursa Malaysia from 2005 to 2008. All the 49 construction companies are divided into big, medium and small sizes, based on the paid-up capital. The data for the study were analysed based on time series-cross sectional analysis and the result shows that there is relationship between capital structure and corporate performance and there was also evidence to show that no relationship exist between the variables investigated.

In the same vein, Adeyemi and Oboh (2011) examined the empirical effects of corporate capital structure (financial leverage) on the market value of a selection of firms listed on the Nigerian Stock Exchange. Both primary and secondary data were obtained for analysis employing both descriptive and inferential statistics for analysis. A sample size of 150 respondents and 90 firms were selected for both primary data and secondary data respectively. Descriptive statistics was used to analyse the primary data, while chi-square was used to draw inference of perceived relationship between capital structure and firm value. The results of the study suggested that a positively significant relationship exists between a firm's choice of capital structure and its market value in Nigeria. The study suggested that listed firms in Nigeria should strategically plan and manage their capital structure in order to maximise their market values. Iorpev and Kwanum (2012) examined the impact of capital structure on the performance of manufacturing companies in Nigeria. The annual financial statements of 15 manufacturing companies listed on the Nigerian Stock Exchange were used for the study which covers a period of five (5) years from 2005–2009. Multiple regression analysis was applied on performance indicators such as return on asset (ROA) and profit margin (PM) as well as short-term debt to total assets (STDTA), long-term debt to total assets (LTDTA) and total debt to equity (TDE) as capital structure variables. They concluded that statistically, capital structure is not a major determinant of firm performance. The study recommends that managers of manufacturing companies should exercise caution while choosing the amount of debt to use in their capital structure as it affects their performance negatively.

In addition, Babalola (2012) investigated the relation between return on equity (ROE) and the capital structure for a sample of 10 firms from 2000 to 2009. The study uses regression analysis technique and concluded that there is a strong curvilinear relation between ROE and the debt-to-assets ratio. The result signifies that the manufacturing industry's capital structure in Nigeria is consistent with trade-off theory, and the results are consistent with the hypothesis that the corporate performance is a nonlinear function of the capital structure. Similarly, Uwalomwa and Uadiale (2012) investigated the relationship between capital structure and the financial performance of listed firms in Nigeria. The study considered a total sample of 31 listed firms on the floor of the Nigerian Stock Exchange. The annual reports for the period 2005–2009 were analysed using the OLS technique of model estimation. The study observed that two of the explanatory variables in this study (i.e., short-term debt and shareholders' funds) have a significant positive impact on the financial performance of listed firms in Nigeria. In addition, the study observed that long-term debt has a significant negative impact on the financial performance of firms. To this end, the study concluded that employing high proportion of long-term debt in firms' capital structure will invariably result in a low financial performance of a firm.

Wamba and Bengono (2014) examined the relationship between the structure of the start-up capital and the survival of companies using a sample of 8,742 Cameroonian companies obtained from 2011 database of the NIS. The study considers the structure of the start-up capital as the share of the managerial capital (share of the capital held by the entrepreneur and his family), the share of capital held by the majority shareholder and the holding of shares by professional investors during the creation of the company. Descriptive statistics, correlation and ordinary least squares regression were used as techniques for data analysis. The results show that generally, the structure of the capital at the creation of the company has a positive and significant influence on the survival of the given company in Cameroon and that the survival of the company improves with the share of the capital held by the entrepreneur and his family, the share of the capital held by the majority shareholder and the presence of professional investors in the capital of the company during its creation.

2.7 Theoretical framework

Several theories have emerged to explain firms' capital structures and their resultant effects on their market values. Among these theories, the ones that explain this work are the capital structure irrelevance and relevance theory, pecking order theory, the agency cost theory and the trade-off theory. These theories are therefore explained thus:

2.7.1 Capital structure irrelevance and relevance theory

These theories as propounded by Modigliani and Miller (1958 and 1963) state that under perfect capital market conditions, a firm's value depends on its operating profitability rather than its capital structure, that is, value irrelevant. But, in their tax-corrected paper, Modigliani and Miller (1963) showed that when corporate tax laws permit the deductibility of interest payments, the market value of a firm is an increasing function of leverage. But while this theory successfully introduced the potential effects of corporate taxes into the capital structure theory, it only leads to an extreme corner effect as the firm's value is maximised when 100% debt finance is used (Mollik, 2008). In reality, it is impracticable, probably because of the uncertainty of interest tax-savings, and the existence of personal taxes (Miller, 1977) and non-debt tax shields (DeAngelo and Masulis, 1980) putting limit to this limitless tax advantage to debt. Following this theory, it is apparent that a significant relationship exists between a firm's choice of capital structure and its market value.

2.7.2 Capital structure and the pecking order theory

The pecking order theory of capital structure as introduced by Donaldson (1961) is among the most influential theories of corporate leverage. It goes contrary to the idea of firms having a unique combination of debt and equity finance, which minimise their cost of capital. The theory suggests that when a firm is looking to finance its long-term investments, it has a well-defined order of preference with respect to the sources of finance it uses. It states that a firm's first preference should be the utilisation of internal funds (i.e., retain earnings), followed by debt and then external equity. He argued that the more profitable firms become, the lesser they borrow because they would have sufficient internal finance to undertake their investment projects. He further argued that it is when

the internal finance is inadequate that a firm should source for external finance and most preferably bank borrowings or corporate bonds. And after exhausting both internal and bank borrowing and corporate bonds, the final and least preferred source of finance is to issue new equity capital.

According to Myers (1984), due to adverse selection, firms prefer internal to external finance. When outside funds are necessary, firms prefer debt to equity because of lower information costs associated with debt issues. These ideas were refined into a key testable prediction by Shyam-Sunder and Myers (1999), that the financing deficit should normally be matched dollar-for-dollar by a change in corporate debt. As a result, if firms follow the pecking order, then in a regression of net debt issues on the financing deficit, a slope coefficient of one is observed. Fama and French (2002) tested some qualitative predictions of the pecking order theory as against the qualitative predictions of the trade-off model. In their findings, they suggested that more profitable firms are less levered and it is consistent with the pecking order. And also, those firms with greater investment opportunities are less levered as predicted by the trade-off theory.

2.7.3   Capital structure and the static trade-off theory

The static trade-off theory of capital structure (also referred to as the tax-based theory) states that optimal capital structure is obtained where the net tax advantage of debt financing balances leverage related costs such as financial distress and bankruptcy, holding firm's assets and investment decisions constant (Baxter and Nevins, 1967; Altman, 1984). In view of this theory, issuing equity means moving away from the optimum and should therefore be considered bad news. According to Myers (1984), firms adopting this theory could be regarded as setting a target debt-to-value ratio with a gradual attempt to achieve it. However, he suggested that managers will be reluctant to issue equity if they feel it is undervalued in the market. The consequence is that investors perceive equity issues to only occur if equity is either fairly priced or overpriced. As a result investors tend to react negatively to an equity issue and management is reluctant to issue equity.

Myers and Majluf (1984) assumed that firms' managers have superior information about the true value of the firms and that managers will therefore time a new equity issue if the market price exceeds their own assessment of the stock value, that is, if the stocks are overvalued by the market. Since investors are aware of the existence of the information asymmetry they will interpret the announcement of an equity issue as a signal that the listed stocks are overvalued, which subsequently will cause a negative price reaction. The literature on static trade-off theory has been voluminous and a number of questions have been asked as to whether or not expected increase tax-shield benefits from employing debt finance may offset the financial distress cost such as; cash flow volatility, possible bankruptcy cost in the event of default, competitive threat if strained for cash. Based on this theory, optimum leverage is determined by balancing the corporate tax saving advantage of debt against the deadweight costs of bankruptcy (DeAngelo and Masulis, 1980; Bradley et al., 1984; Barclay and Smith, 1999; Myers, 1984). But, others have questioned it. This theory of capital structure supports the idea of a firm having a unique capital mix in order to maximise its market value taking into consideration both the bankruptcy costs and tax-shield advantage of debt capital. It predicts a positive relationship between a firm's choice of capital structure and its market value.

Miller (1977) argued that the tax savings seem large and certain while the bankruptcy cost seems to be negligible, implying that many firms should be more highly levered than they really are. Myers (1984) argued that if this theory were key force, then the tax variables should provide an important insight about optimum capital structure decision. The static-order-hypothesis theory also predicts that more profitable firms should carry more debt since they have more profits that need to be protected from taxation. But others criticised this prediction, such as Myers (1984), Titman and Wessels (1988) and Fama and French (2002). The trade-off theory predicts that larger and more mature firms use more debt in their capital structure than equity.

2.7.4 Capital structure and the agency cost theory

The agency cost theory of capital structure as propounded by Jensen and Meckling (1976) states that an optimal capital structure will be determined by minimising the costs arising from conflicts between the parties involved. They argued that agency costs play an important role in financing decisions due to the conflict that may exist between shareholders and debt holders. And that when companies are approaching financial distress, shareholders can encourage management to take decisions, which in effect, expropriate funds from debt holders to equity holders. The general result of these extensions is that the combination of leverage related costs (such as bankruptcy and agency costs) and a tax advantage of debt produces an optimal capital structure at less than a 100 percent debt financing as the tax advantage is traded off against the likelihood of incurring the costs. Parrino and Weisbach (1999) empirically estimated that the agency costs of debt are too small to offset the tax benefits. However, debt moderates the manager-shareholder conflict and reduces the agency costs of equity by raising the manager's share of ownership in the firm. Also, debt can reduce agency costs of equity by reducing the amount of free cash available to managers to engage in the pursuits since debt commits the firm to pay out cash (Jensen, 1986).

3   Methodology

The population of the study comprised the entire seven construction companies listed on the Nigerian Stock Exchange as at December 2013. The study employs ex-post factor research design which used the annual financial reports of the construction companies under study as well as the fact book of the Nigerian Stock Exchange to generate data for the study. A filtering technique was adopted to arrive at the five (5) sampled construction companies for the study. The sample of the study is arrived at using the three filters. These filters are:

1   the company must have annual accounts for the period under consideration (2003–2012)

2   the company must be duly incorporated as a limited liability company as required by the Company and Allied Matters Act (CAMA, 2004)

3   the company must be listed on the Nigerian Stock Exchange for the period under consideration (2003–2012).

The data for the study was generated from the annual reports and accounts of the sampled construction companies for the study and the Nigerian Stock Exchange Fact Book. The study employed panel data methodology using pooled regression, fixed-effect estimation and random-effect estimation techniques. The panel data help to explore both cross-sectional and time series data simultaneously. The panel data analysis was computed using Stata 12.0.

4   Results and discussion

4.1   Results

Table 1 shows the pooled regression result which indicates that a change in debt to equity ratio (DE) will lead to –30.83531 changes in return on capital employed (ROCE). Also, a change in SIZE will lead to 23.35573 changes in return on capital employed (ROCE) and finally, a change in AGE will lead to –4.465962 changes in return on capital employed (ROCE). The R^2 shows that 0.2109 (21%) of the systemic variation in return on capital employed (ROCE) was explained by the DE, SIZE and AGE. Table 1 also shows the probability of F test as 0.0030 which indicates that all the parameters are statistically significant.

Table 1   Pooled regression result

Source	SS	df	MS	Number of obs = 50	
Model	80,857.9317	3	26,952.6439	F(3, 46) = 5.37	
Residual	231,061.766	46	5,023.	Prob > F = 0.0030	
Total	311,919.698	49	6,365.70811	R-squared = 0.2592	
				Adj R-sqd = 0.2109	
				Root MSE = 70.874	
ROCE	Coef.	Std. err.	t	P>|t|	[95% conf. inte]
DE	–30.83531	9.871115	–3.12	0.003	–50.70483 –10.96578
SIZE	23.35573	12.61398	1.85	0.071	–2.034897 48.74637
AGE	–4.465962	1.806272	–2.47	0.017	–8.101799 –.830125
Cons	–55.75455	139.751	–0.40	0.692	–337.0588 225.5497

Source: Stata 12.0

Table 2 shows the fixed effect regression result which indicates that an increase in DE will lead to reduction in the ROCE. That is there is an inverse relationship between ROCE and DE. Any increase in DE will reduce the ROCE to the tune of 24.05278. In addition, the table shows that there is an inverse relationship between SIZE and ROCE. That is any increase in SIZE will reduce ROCE to the tune of 3.150515. Table 2 further revealed that there is a positive relationship between AGE and ROCE, which indicates that an increase in age will lead to an increase in ROCE to the tune of 5.870849. Table 2 also shows the probability of F test as 0.0125 which indicates that all the parameters are statistically significant. Besides showing the partial test for variables debt to equity, size and age, the output also show the Chow test that compare common effect with fixed effect (common vs. fixed). The rejection area (rejecting the null hypothesis is the Prob of

cross section F). Just see the F test that all u_i = 0: on the bottom of the output. It had been known that the alternating hypothesis is always 'fixed effect model chosen'. Table 2 shows that Prob F is 0.0021 smaller than alpha 5%, so the null hypothesis is rejected and the fixed effect is considered better than the pool/common effect.

Table 2   Fixed effect regression result

Fixed-effects (within) regression			Number of obs = 50			
Group variable: Company Name			Number of groups = 5			
R-sq: within = 0.2256			Obs per group:	min = 10		
between = 0.5187				avg = 10.0		
overall = 0.0058				max = 10		
			F(3,42) = 4.08			
corr(u_i, Xb) = –0.7722			Prob > F = 0.0125			
ROCE	*Coef.*	*Std. err.*	*t*	*P > |t|*	*[95% conf. interval]*	
DE	–24.05278	9.322131	–2.58	0.013	–42.8656	–5.239957
SIZE	–3.150515	35.46902	–0.09	0.930	–74.72989	68.42886
AGE	5.870849	5.556616	1.06	0.297	–5.342857	17.08455
CONS	–98.16657	225.5271	–0.44	0.666	–553.2987	356.9656
sigma_u	90.798859					
sigma_e	64.907959					
rho	.66180604 (fraction of variance due to u_i)					
F test that all u_i = 0:			F(4, 42) = 5.03		Prob > F = 0.0021	

Source: Stata 12.0

Table 3   Random effect regression result

Random-effects GLS regression			Number of obs = 50			
Group variable: Company name			Number of groups = 5			
R-sq: Within = 0.1393			Obs per group:	min = 10		
Between = 0.6432				avg = 10.0		
Overall = 0.2592				max = 10		
			Wald chi^2 (3) = 16.10			
			Prob > chi^2 = 0.0011			
ROCE	*Coef.*	*Std. err.*	*z*	*P>|z|*	*[95% conf. interval]*	
DE	–30.83531	9.871115	–3.12	0.002	–50.18234	–11.48828
Size	23.35573	12.61398	1.85	0.064	–1.367219	48.07869
AGE	–4.465962	1.806272	–2.47	0.013	–8.00619	–.9257341
CONS	–55.75455	139.751	–0.40	0.690	–329.6615	218.1524
sigma_u	0					
sigma_e	64.907959					
rho	0 (fraction of variance due to u_i)					

Source: Stata 12.0

Table 3 shows the random effect regression result which indicates that an increase in DE will lead to reduction in the ROCE. That is there is an inverse relationship between ROCE and DE. Any increase in DE will reduce the ROCE to the tune of 30.83531. In addition, the table shows that there is positive relationship between SIZE and ROCE. That is, any increase in SIZE will increase ROCE to the tune of 23.35573. Table 3 further revealed that there is an inverse relationship between AGE and ROCE, which indicates that any increase in AGE will reduce ROCE to the tune of 4.465962. Table 3 also shows the probability of F test as 0.0011 which indicates that all the parameters are statistically significant.

Table 4   Hausman test result

	Coefficients			
	(b) *Fixed*	*(B)* *Random*	*(b − B)* *Difference*	*Sqrt(diag(V_b − V_B))* *S.E.*
DE	−24.05278	−30.83531	6.782529	.
SIZE	−3.150515	23.35573	−26.50625	33.15024
AGE	5.870849	−4.465962	10.33681	5.254842

Notes: b = consistent under Ho and Ha; obtained from xtreg.
   B = inconsistent under Ha, efficient under Ho; obtained from xtreg.
   Test: Ho: difference in coefficients not systematic
   $\text{chi}^2(3) = (b − B)'[(V\_b − V\_B)\wedge(−1)](b − B)$
        $= 1.476$
   $\text{Prob} > \text{chi}^2 = 0.0020.$

To know which of the two effects (fixed or random) to be selected, the Hausman test was carried out. Table 4 shows the Hausman test to be 14.76 and the P-value is 0.0020. It can be seen that probability of the chi-square is 0.0020 smaller than alpha 5%, therefore, the null hypothesis is rejected and the alternating hypothesis accepted and the fixed effect model is considered as the better model than the random effect.

The fixed effect regression equation is thus:

$$\text{ROCEit} = −98.16657 − 24.05278\text{DEit} − 3.150515\text{SIZEit} + 5.870849\text{AGEit} + \text{eit}$$

4.2   Discussion of results

The fixed effect regression result shows that an increase in DE will lead to reduction in the ROCE (Table 2). That is there is an inverse relationship between ROCE and DE. Any increase in DE will reduce the ROCE to the tune of 24.05278. This result suggests that there is strong evidence to conclude that there is an inverse relationship between DE and ROCE of firms in the Nigerian construction industry. This shows that capital structure (DE) is having a negative impact on performance (ROCE). This finding is consistent with the findings of Chou and Lee (2007), Tian and Zaitun (2007), Akintoye (2008), Onaolapo and Kajola (2010), Pratheepkanth (2011), Babalola (2012) and Iorpev and Kwanum (2012) who found that capital structure has negetive impact on performance.

Similarly, the fixed effect regression result shows that there is an inverse relationship between SIZE and ROCE. That is any increase in SIZE will reduce ROCE to the tune of 3.150515. This means that there is enough evidence to conclude that there is negative relationship between SIZE and performance (ROCE) of firms in the Nigerian

construction industry. This finding is in conformity with the findings of Memon et al. (2009) who found out that Pakistan textile firms which are large in size and are under performing and operating below the economies of scale. However, the finding contradicts that of Onaolapo and Kajola (2010) who found positive relationship between SIZE and performance. Furthermore, the fixed effect regression result shows a positive relationship between AGE and performance (ROCE), which indicates that an increase in age will lead to an increase in ROCE to the tune of 5.870849. This means that there is strong evidence to say that there is positive relationship between AGE and performance (ROCE) of firms in the Nigerian construction industry. This finding is consistent with that of Onaolapo and Kajola (2010) who found that there is positive relationship between AGE and performance.

5   Conclusions and recommendations

The study after careful review of relevant literatures and the discussion of results concludes that capital structure (DE) has a negative impact on return on capital employed (ROCE) of the sampled construction companies. Also, there is negative relationship between SIZE and return on capital employed (ROCE) of firms in the Nigerian construction industry. Furthermore, there is positive relationship between AGE and return on capital employed (ROCE) of firms in the Nigerian construction industry. However, Since the study found that ROCE has negative relationship with capital structure, it is therefore recommended that managers of the construction companies should be careful while using debt as a source of finance, they should try to finance their activities with retained earnings and use debt as a last option as supported by the pecking order theory. In addition, professionals and qualified personnel should be charged with the financing decision of construction firms in Nigeria since the optimal capital structure is a must for them to compete effectively and survive in times of financial and economic distresses, and attain an optimal capital structure requires and effective and strategic planning.

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