An Empirical Analysis of Low-Leverage Behaviour: Evidence from Nigerian Quoted Firms

Oluseun Paseda

Working Paper Series: CF002

AFRICAN ECONOMIC RESEARCH CONSORTIUM
CONSORTIUM POUR LA RECHERCHE ÉCONOMIQUE EN AFRIQUE

Bringing Rigour and Evidence to Economic Policy Making in Africa

An Empirical Analysis of Low-Leverage Behaviour: Evidence from Nigerian Quoted Firms

By

Oluseun Paseda
Department of Banking and Finance
University of Ibadan, Nigeria

AERC Working Paper Series: CF002
African Economic Research Consortium, Nairobi
November 2021[1]

THIS RESEARCH STUDY was supported by a grant from the African Economic Research Consortium. The findings, opinions and recommendations are those of the author, however, and do not necessarily reflect the views of the Consortium, its individual members or the AERC Secretariat.

Published by: The African Economic Research Consortium
P.O. Box 62882 - City Square
Nairobi 00200, Kenya

Contents

List of tables

List of figures

Abstract

Debt conservatism is one of the enduring puzzles in capital structure research. The reluctance of profitable firms to commit to high debt ratios to exploit tax benefits of debt has profound consequences for capital structure dynamics. Inspired by studies examining the persistence of conservative debt usage by firms, this paper examines the low-leverage behaviour within the Nigerian context, where it is a largely unexplored area. Using a sample of 50 non-financial corporations quoted on the Nigerian Stock Exchange (NSE) for the period 1999-2019, the study documents the following findings. The mean (median) market debt ratio for the entire sample period was 27.5% (19.5%), corresponding to the 60^{th} (50^{th}) percentile. Firm-years with market leverage ratios ranging from 40% and downwards to zero percent met the criteria for inclusion in the observation of low leverage phenomenon (LLP). The mean (median) market debt ratio for the defined low-leverage sub-sample was 12.7% (9.6%). Conservative capital structure is evident across the 17 industries embodied in the sample, and debt conservatism is a declining function of rating, market timing, financing deficit, asset riskiness and firm size. Conservative behaviour increases with marginal tax rate, non-debt tax shields, growth, profitability, liquidity, uniqueness, age, relationship-specific investments and employee bargaining power. Both managerial conservatism and tax exhaustion appear to explain the LLP, with the former exerting greater impact.

Keywords: *Capital structure; Debt conservatism; Low leverage behaviour; Managerial conservatism; Tax exhaustion*

JEL Classification: *G30, G32*

1. Introduction

Overview of corporate financing

A great deal of finance research beginning from the seminal work of Modigliani and Miller (1958;1963) has studied corporate financial structure, especially the determinants of capital structure. Although there have been much progress and insights on the wider capital structure research, questions remain as to why some firms do not appear to use debt financing as much as tax benefits (and sometimes agency benefits) would suggest, and which specific firm attributes rationalize the apparent debt conservative behaviour. Miller (1977) was the first to uncover the apparent debt conservatism based on the divergence of corporate tax benefits of debt and the estimated bankruptcy costs for "under-levered firms" – his so-called "horse and rabbit stew" phenomenon. Miller (1977) opined that the personal tax disadvantage of debt is a countervailing force for corporate borrowing.

Different theories and empirical strategies have attempted to explain why some firms do not take on more debt and, as such, fail to make the most of the tax benefits of borrowing. Among others, the trade-off, pecking order, agency and financial growth lifecycle theories try to explain observed leverage ratios, but they do not fully explain the above-mentioned low leverage behaviour (LLB) . Estimating and comparing the costs of debt and tax savings from debt, and linking debt conservatism to both different cost variables and non-debt tax shields are some of the approaches that have been used to uncover the LLB.

With respect to the impact of the costs of debt, the choice between debt and equity financing has been described in a context in which firms choose their optimal debt levels by balancing the benefits and costs of attaining it (Frank and Goyal, 2008). Prominent among the benefits of using debt financing are the tax savings that are generated due to the interest deductibility. Even though there is evidence suggesting the relevance of debt tax benefits in corporate capital structures, there are stylized proofs that support the notion that highly profitable, low-default probability, and high marginal tax rate firms are no more likely to use debt than other types of firms (Graham, 2013; Scholes et al., 2015). The counterweight to debt benefits generally comes from financial distress costs (Bradley, Jarrell and Kim, 1984), the cost of personal taxes (Miller, 1977), non-debt tax shields (DeAngelo and Masulis, 1980), and the twin agency costs

due to conflicts between managers and investors or between shareholders and bondholders (Jensen and Meckling, 1976; Myers, 1977).

A major drawback encountered in empirical regression approaches involving firm-specific attributes such as size, profitability, age, liquidity, asset tangibility, etc (Flannery and Rangan, 2006; Frank and Goyal, 2009; Korteweg, 2010; Zingales, 2015; DeAngelo and Roll, 2015; Admati et al., 2018; Barclay and Smith, 2020; DeMarzo and He, 2021) is a possible failure to detect too much debt (aggressive capital structure) or too little debt (conservative capital structure), on average. Developing countries' perspectives to apparent debt conservatism– sometimes in relation to dividend payout policy, which is a connected corporate financial policy–provided by Soyode (1978), Adelegan (2000; 2002; 2003; 2009), Gwatidzo and Ojah (2009), Amah and Ezike (2013), Amah (2014) and Oyelakin (2020) also suffer similar limitations. Several papers have attempted to overcome this shortcoming by estimating the ex-ante costs of financial distress and comparing the same with estimated tax benefits of debt (Molina, 2005; Korteweg, 2010; Cohn et al., 2020; DeAngelo, 2021; and Attaoui et al., 2021). Other areas considered by prior work include calculating net benefits to debt from market values and betas of corporate debt and equity (Korteweg, 2010), or estimating the marginal cost curve for corporate leverage and determining its intersection with the tax benefit curve (Graham et al., 2017; van Binsbergen, Graham and Yang, 2010; Clemente-Almendros and Sogorb-Mira, 2018), among others.

Further, the role of alternative tax shelters to debt, commonly called non-debt tax shields, have been considered as a credible rationale for the LLB. The presence of alternative tax shelters that act as substitutes to the fiscal benefits of debt might reduce the tax incentive to corporate borrowing. Blouin et al (2010) find evidence stating that under-levered firms have difficult-to-measure non-debt tax shields that are not captured in empirical works' estimates of taxable income, opening up a debate about how to measure the effect of substitutes for fiscal interest deductions (Clemente-Almendros and Sogorb-Mira, 2018).

It is evident from the foregoing that the corporate finance field accepts that some firms are using debt cautiously than warranted in the light of the tax benefits of borrowing. It is also correct to state that a reasonable estimation of under-leverage behaviour requires a cost-benefit approach in terms of comparison of the financial distress costs occasioned by debt usage, and the tax savings benefits that accrue to firms' use of debt and non-debt tax shields. In this study, the primary objective is to identify firm-specific attributes that underscore these parameters in a bid to provide a systematic rationale of the economic mechanisms driving low leverage behaviour. For instance, debt rating is an index of a firm's access to debt market and should reduce the cost of debt for rated firms relative to their "unrated" counterparts. Asset riskiness and availability of tangible assets are potential indicators of firms' debt capacity and, thus, may explain the conservative use of debt or otherwise. Product uniqueness, employee bargaining power and relationship-specific investments may also explain how debt usage may escalate the overall risk profile of a firm to its

diverse stakeholders such as customers, employees, suppliers and other non-financial creditors and stakeholders (Titman and Wessels, 1988; Buckley, et al., 2020). Attaoui et al. (2021) demonstrate that debt conservatism in its extreme form–zero-leverage behaviour–may be an optimal strategy in a static trade-off framework with ambiguity averse managers and investors.

The purpose of this study is to provide an explanation of the economic mechanism driving the low leverage phenomenon (LLP) in Nigerian quoted firms. Related to this, the study considers the empirical validity of the pecking order *vis-à-vis* the trade-off predictions of capital structure. With this investigation, the study contributes to the debate relating to the determination of corporate capital structure, further advancing the empirical finance literature in various ways. By investigating the question of LLP in Africa's most populous and largest economy where such works are scanty, there is an attempt to achieve triangulation in empirical finance research to ascertain the portability of empirical models in a developing country. To the extent that the theories that have been tested in developed markets also apply to Nigeria, then the theories' implications in those developed markets can be generalized and adopted by public and private policy makers in developing economy settings, otherwise there should be exercise of caution in their adoption or application.

In pursuit of the debt conservatism research agenda, at least three key hypotheses have emerged, namely: the managerial entrenchment hypothesis, the financing constraints hypothesis; and the tax exhaustion hypothesis. The managerial entrenchment hypothesis suggests that entrenched managers avoid facing performance scrutiny arising from improved governance mechanisms and choose a low leverage policy that does not force the firm to "disgorge cash" (Jensen and Meckling, 1976; Jensen, 1986; Jensen, 1993). Financing constraints hypothesis describes low-leverage as a consequence of lack of access to debt market, perhaps due to perceived riskiness of a small, young and un-rated firm. Tax exhaustion hypothesis applies to accumulated loss-making firms who have little or no taxable earnings as to warrant borrowing to reduce tax bill.

This study is similar to Paseda and Adedeji (2020), which considers zero-leverage phenomenon in Nigeria, but different from it in the sense that the earlier work considers the extreme case of debt conservatism. In that study, debt conservatism or zero market leverage ranges from 0-5%. However, in this study, debt conservatism considers market leverage ratios from 40% downwards to nil. The choice of 40% as cut-off is inspired by similar studies such as Haddad and Lotfaliel (2019) and Lundberg and Lotfaliel (2019) on the fractiles of corporate leverage distributions in light of costs and benefits of debt.

This study embodies the possibility that firms may not always have low-leverage as in a dynamic capital structure framework. Firm-years in which low-leverage ratios are observed, based on the defined threshold, are captured as low-leverage, nonetheless. The study's key result is that firms that follow conservative debt policy (including those that are zero-levered) are more profitable and liquid, have higher tangible

assets, higher growth opportunities, pay higher dividends, have higher relationship-specific investments, higher employee bargaining powers, and are older. The empirical analysis also reveals that non-debt tax shields act as debt substitutes and account for conservative debt usage. The results are robust to alternative estimation methods and different cut-off rates for debt conservatism. The results also overcome potential endogeneity and simultaneity concerns with such explanatory variables as dividends, growth, relationship-specific investments, employee bargaining power and financing deficits. Taken together, the results provide a profound developing country perspective of the assertion by Graham (2000) and others in the burgeoning empirical literature on debt conservatism.

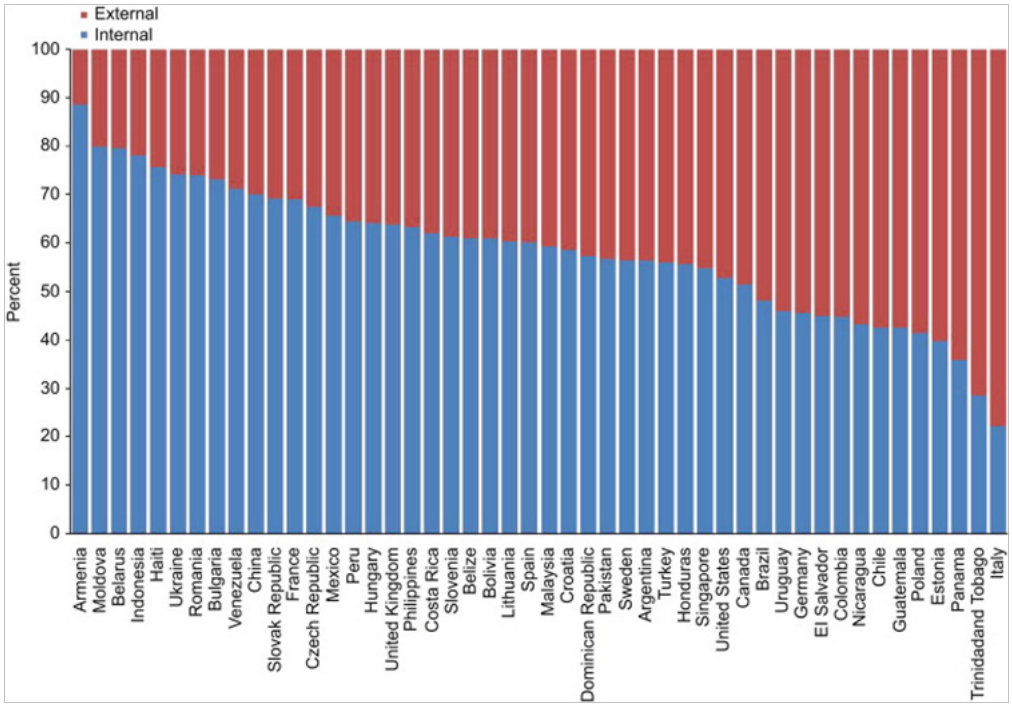
Corporate financing patterns in africa and around the world

Firms can raise investment capital from a variety of sources or of finance categories, namely: internal capital or external capital; debt or equity; short-term debt or long-term debt; long-term debt or external equity. The firm's financial policy describes the mix of instruments used to finance the growth of the firm. Yartey (2009) and Ezeoha (2017) attempt to contextualize financing patterns within the African context.

Internal capital refers to the use of earnings generated by a firm to fund its growth. Internal capital is a major source of funding for many companies in developed capital markets. Figure 1 (extracted from Beck et al., 2008) reveals that many companies in Europe rely primarily (on average, 50-75% range) on retained earnings to fund their growth programmes. Beck et al. (2008) argue that the variation in financing patterns across the world can be explained by the relative degree of financial and legal development within each country. Emerging markets' firms with newly developed financial market structures are more likely to draw on internal finance than on public issues of debt or equity.

For Nigerian quoted non-financial firms, however, despite relatively under-developed financial systems, the ratio of external finance to internal finance is approximately 90% over the 1999-2020 period. The financing patterns are captured in Table 1. Figure 2 embodies the institutional contexts of stock market development and domestic credit of Sub-Saharan African (SSA) countries relative to United States of America (USA), United Kingdom (UK) and world average. Graham et al. (2015) argue that the rise in US corporate debt from 11% in 1945 to nearly 50% in the 1990s to the rise in macroeconomic uncertainty, public debt and financial development. Figure 3 captures the relative debt components of South African companies' balance sheets and demonstrates the relative rise in leverage through time.

Figure 1: Financing patterns around the world



Source: Beck, Demirguc-Kunt and Maksimovic (2008)

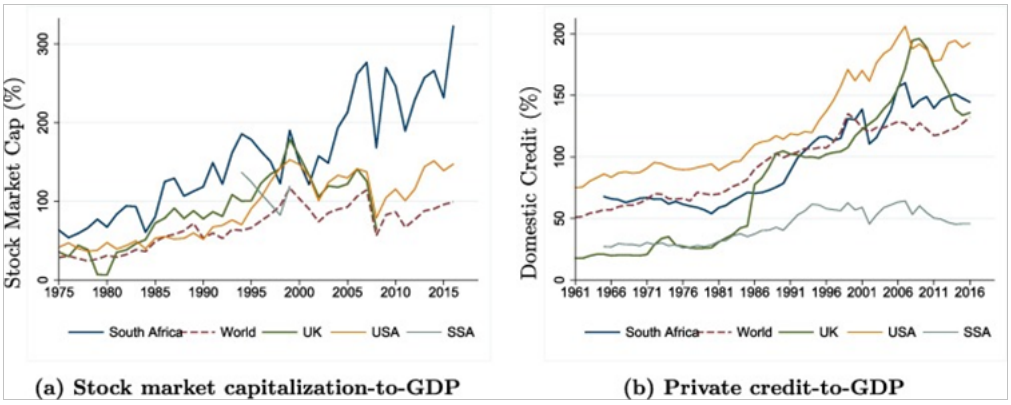
Given the data in Table 1, which suggests greater reliance on external finance by Nigerian quoted non-financial firms, and the fact that the equity portion of external finance ranges from 33-42% over the period 1999-2020, then one should be interested in studying the evolution of debt ratios. Machokoto, Areneke and Ibrahim (2020) argue that "emerging markets provide interesting research settings because their weak institutional structures and the low levels of capital market development create greater challenges in accessing external sources of financing. Firms in developed countries find it easier to raise external finance, owing to institutional openness and higher levels and quality of information disclosure. However, firms in emerging markets find it more difficult because of high levels of information asymmetry and weak regulatory frameworks, which inadequately discourage or restrict adverse practices such as corruption" …and "conjecture that the determinants of the rising corporate debt levels in developed economies may not be generalizable to emerging economies, which have markedly different financial infrastructures, degrees of institutional openness, and levels of capital market development."

Table 1: Corporate financing patterns in Nigeria (1999-2020)

Years	External Equity	Internal Finance	External Finance
1999	0.390	0.095	0.905
2000	0.373	0.108	0.892
2001	0.385	0.111	0.889
2002	0.381	0.120	0.880
2003	0.358	0.115	0.885
2004	0.333	0.111	0.889
2005	0.357	0.110	0.890
2006	0.360	0.092	0.908
2007	0.372	0.101	0.899
2008	0.368	0.099	0.901
2009	0.396	0.085	0.915
2010	0.424	0.084	0.916
2011	0.380	0.089	0.911
2012	0.385	0.083	0.917
2013	0.388	0.092	0.908
2014	0.388	0.088	0.912
2015	0.386	0.096	0.904
2016	0.376	0.091	0.909
2017	0.369	0.089	0.911
2018	0.371	0.090	0.910
2019	0.371	0.093	0.907
2020	0.401	0.099	0.901

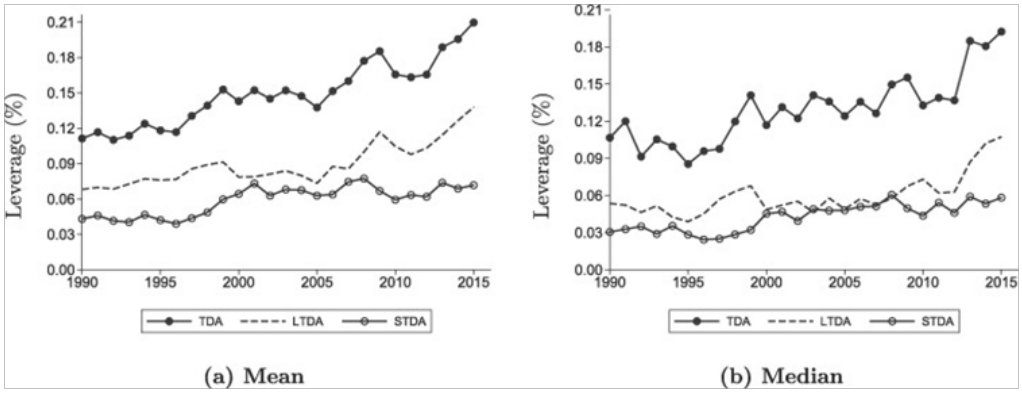
Source: Authors' analysis of capital structures of sample firms

Figure 2: Institutional context of corporate financing patterns around the World (1975-2015)



Source: Machokoto, Areneke and Ibrahim (2020)

Figure 3: Average total debt in South Africa (1990-2015)



Source: Machokoto, Areneke and Ibrahim (2020)

2. Literature review

Capital structure theories

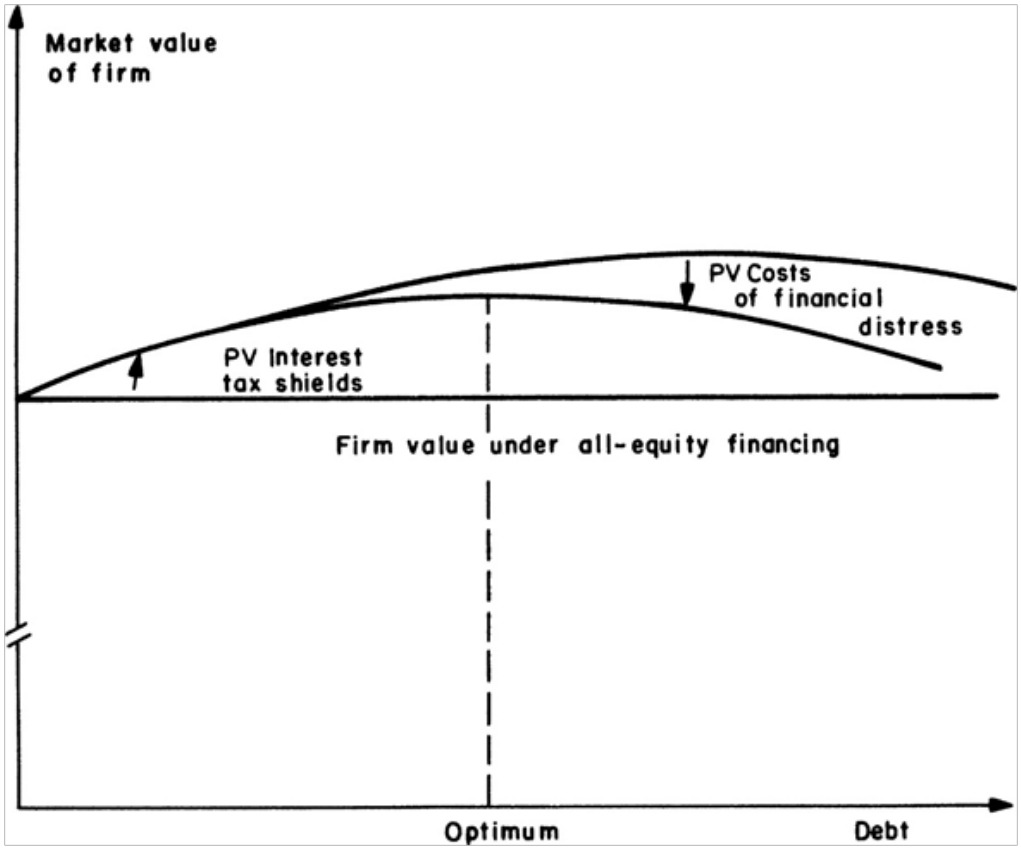
Modigliani and Miller-MM (1958; 1963) provide the agenda for the modern theory of capital structure. Since the MM papers, a number of different theories attempt to rationalize the debt-equity decision. However, as stated earlier, none of them is able to fully explain the apparent debt under-use in light of tax deductibility of interest on debt.

The trade-off theory of capital structure postulates that firms should pursue an optimal debt policy until the marginal benefit of borrowing equals the marginal cost. The gain from leverage arises from the tax deductibility of interest payments at corporate level. Conversely, bankruptcy and/or financial distress costs reduce the tax benefit advantage. The debt tax benefit coupled with default costs creates an optimal leverage ratio where the value of the firm is maximized. This traditional view of corporate capital structure has contributed to the explanation of much of the observed capital structures, by identifying the relationships between debt ratio and firm characteristics (Frank and Goyal, 2008; Frank and Goyal; 2009; Paseda, 2016). Figure 4 is a graphical portrayal of the static trade-off theory of capital structure.

Nevertheless, there are corporate financing patterns that challenge and contradict the trade-off predictions, such as the low debt usage of highly profitable firms in high marginal corporate tax brackets (proxy for large tax burdens) and despite such firms' low distress costs (Miller, 1977; Miller, 2005; Molina, 2005; van Binsbergen, Graham and Yang, 2010).

The pecking order theory, as framed by Myers (1984) and Myers and Majluf (1984), postulates that because of asymmetric information problems that are more severe for riskier securities, firms prefer to finance with retained earnings or internally generated equity, external financing is primarily debt, and debt financing is primarily short-term. New equity is issued as a last resort. Pecking order may also arise from issuance costs, which are zero for retained earnings, low for debt and highest for equity issues. Rajan and Zingales (1995), Frank and Goyal (2003), Fama and French (2012), among others, demonstrate that firms with sufficient internally generated equity use debt conservatively. Unlike the trade-off model with predicted optimum debt usage, there is no unique optimal debt-equity ratio in the pecking order model because there are two kinds of equity, viz: one at the top of the pecking order (retained earnings) and the other at the bottom (external equity). Yildirim and Celik (2021) provide recent evidence in defence of the pecking order.

Figure 4: The trade-off theory of capital structure



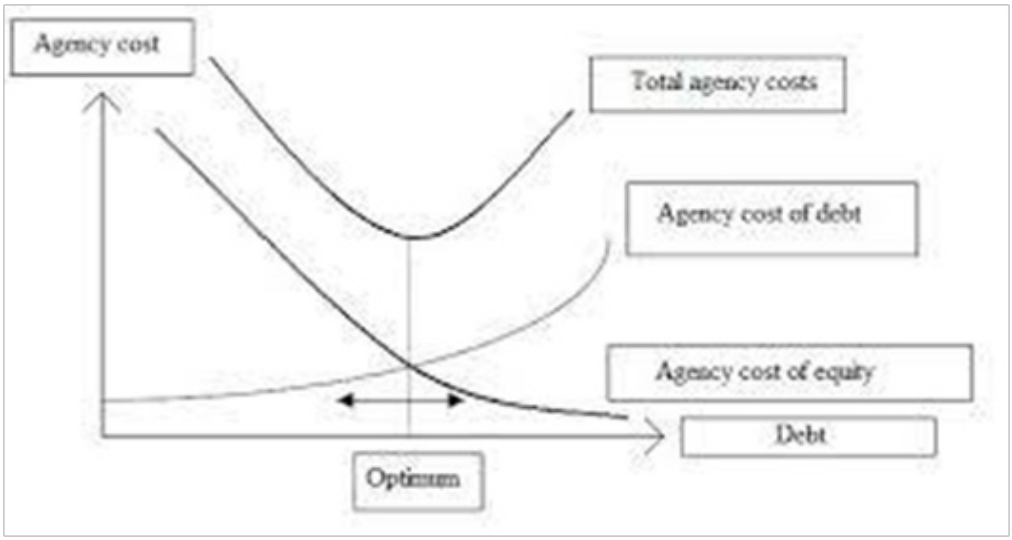
Source: Myers (1984) capital structure puzzle

A market conditions model of capital structure has several variants. They share the prediction that firms with high market values relative to fundamentals such as book value issue more new shares. The market-timing version of the theory is an offshoot of the behavioural story for value premium in average stock returns. DeBondt and Thaler (1985), Lakonishok et al. (1994) and Akintola-Bello (2004) argue that growth stocks, characterized by high ratios of stock price to book value, tend to be overvalued and low price-to-book firms (distressed/value firms) tend to be undervalued. Gradual corrections of market prices produce the value premium; that is, low average returns for growth stocks and high average returns for value stocks. In the market-timing model, managers use corporate financing decisions to exploit the slow correction of pricing errors. In essence, high price-to-book growth firms prefer share issues to take advantage of stock prices that are too high over new debt or retained earnings. The repurchases of overpriced shares would constitute a bad investment for growth firms, but dividends are appealing because, given optimal investment policy, they allow growth firms to issue over-valued securities. However, for low price-to-book value firms, financing patterns follow a reverse order. Retained earnings are the cheapest financing instrument, followed by slightly under-priced debt, then by

more under-priced long-term debt, with most under-priced new equity last in line. Repurchases of under-priced equity are attractive for value firms but dividends have a high opportunity cost. Baker and Wurgler (2002) are chief proponents of the market-timing theory, which Fama and French (2012) label the mispricing model.

The agency theory of capital structure, primarily attributable to Jensen and Meckling (1976), posits that there is an optimal capital structure that balances the agency costs of equity (conflicts between managers and shareholders) against the agency costs of debt (conflicts between debtholders and shareholders). In the agency theoretic framework, debt usage reduces the managerial-shareholders conflict through the disciplinary advantage of contractual debt claims in forcing the managers to pursue efficient operating and investment decisions. Increase in leverage accentuates the debtholders-shareholders' conflict through actual and perceived potential for wealth transfers from bondholders to shareholders through asset substitution, reluctance to liquidate when it is optimal, excessive dividend payout that undermines the collateralized value of the assets, and so on. Figure 5 describes the optimum debt ratio in the presence of agency costs.

Figure 5: Optimal capital structure under the agency theory



Source: Author's literature review

One of the most vocal exposition of the agency model is the free cash flow theory attributable to Jensen (1986). In the free cash flow theory, dangerously high levels of debt increase market value of the firm because such debt levels, through the contractual claims that force disgorgement of cash, reduce possibilities for excessive perquisites consumption by managers, shirking, managerial entrenchment, and temptation to over-invest through commitment of funds in empire-building negative present value (NPV) investments. In other words, free cash flow theory emphasizes the disciplinary role of debt. The desire for managerial entrenchment would thus

propel managers towards conservative financial policies than otherwise. Theoretical and empirical work in Africa is provided by Abor and Biekpe (2006).

Still on the agency perspective to corporate financial policy, Byun, Fuller and Lin (2021) identify two potential channels where inventor Chief Executive Officers (CEOs) may exacerbate agency costs. First, innovative CEOs or managers may be more entrenched and difficult for shareholders to replace, consistent with the presence of captured boards or anti-takeover mechanisms (Faleye, 2007). Second, a different incentive mechanism may be employed to compensate innovative CEOs/managers relative to non-innovative ones, given that the former CEOs have strong intrinsic motivation to discover and chase new ideas (He and Hirshleifer, 2020; Islam and Zein, 2020) and have stronger preference for sensation-seeking. The major dissimilarity in the two channels, however, is that in the first channel, the CEO/managers are acting sub-optimally from the principal's (shareholders') perspective, so that improved corporate governance would attenuate sub-optimal behaviour, whereas in the second channel, agency costs are the outcome of optimal contracting. Byun et al. (2021) offer evidence in support of this second channel, which manifests in excessive cash holding and conservative debt policy in firms with innovative CEOs/managers, interpreted as the "optimal outcome in which firms tolerate some degree of agency costs to promote innovation in hiring innovative CEOs."

Recent research also considers the strategic interaction of capital structure choice with non-financial stakeholders. One of such interactions emphasizes the impact of labour market frictions on corporate financing decisions (Matsa, 2010; Kim, 2020; Liao, 2021; Tsur, 2021; Jiang and Chen, 2021; Dong et al., 2021; Hou, et al., 2021; Vega-Gutierrez et al., 2021). According to this labour market view, frictions in employment, unemployment insurance and labour market (size) generally influence firms towards the conservative use of debt or conservative security design.

3. Empirical review

Costs of debt

The empirical evidence on the debt conservatism puzzle is large. In this context, the "conservative (or low) leverage puzzle" refers to the stylized fact that, on average, firms have low leverage ratios relative to predictions from capital structure theory, especially the trade-off model. For example, Graham (2000) reports that firms are substantially under-levered from the viewpoint of debt tax benefits, and firms that follow a conservative debt policy are more likely to have stable earnings and are profitable. Additionally, Miller (1977) states that due to the relatively low probability of financial distress, the ex-ante costs of debt appear to be small. It has been argued that financial distress has both direct and indirect costs (Almeida and Philippon, 2007; Brealey, Myers and Allen, 2020). Whether such costs are high enough to matter for corporate valuation and capital structure decisions has been a subject of intense debate. Direct costs of distress, such as litigation fees, are relatively little. Indirect costs such as inefficient asset sales, loss of market share, accepting punitive contract terms, and employees' redundancy are believed to be more economically significant (Titman and Wessels, 1988) and are more difficult to quantify (Glover, 2016). Contrary to the previous research, Molina (2005) and Almeida and Philippon (2007) argue that because Graham's (2000) estimates of distress costs are too small, he overestimates the extent to which firms are under-leveraged. Specifically, Molina (2005) offers an estimation for the ex-ante costs of financial distress that can offset the debt tax benefits estimated by Graham (2000). He estimates the effect of an increase in a firm's leverage on the default probability represented by the firm's rating. Estimates of ex-post financial distress costs, obtained by previous empirical research, are then multiplied by firm's default probabilities, resulting in ex-ante costs of financial distress. In the same vein, Almeida and Philippon (2007) calculate the ex-ante distress costs using risk-neutral probabilities of default in a multiperiod setting, and find that the average firm chooses a debt-equity mix that balances the costs of debt with the tax benefits from Graham (2000). Almeida and Philippon (2007) provide an estimate of the cost of default, that is about 4% of firm value for investment grade firms and about 9% for speculative debt.

Blouin et al. (2010) revise the underleverage puzzle from the debt usage benefit side and state that the expected tax benefits accruing from an increase in leverage

to its optimum are roughly 36-54% of Graham (2000) estimates. Nevertheless, subsequent empirical evidence has proved non-significant differences between Graham's (2000) and Blouin et al's (2010) estimates (see for instance, Graham et al., 2017; Ko and Yoon, 2011; van Binsbergen et al., 2010).

Korteweg (2010) and van Binsbergen et al. (2010) compare debt tax benefits with costs of debt and estimate the net benefits to leverage. Despite using very different empirical approaches, they attain very similar results. In particular, the former finds that the median net benefits to debt amounts to about 4% of total firm value, while the latter reach a slightly lower figure of around 3.5% of asset value. Korteweg (2010) calculates the costs of financial distress at 15-30% of firm value for firms in or near bankruptcy. According to van Binsbergen et al. (2010), default costs amount to approximately half of the total costs of debt, leaving the other half to be explained by other factors.

Non-debt tax shields

An alternative explanation of the underleverage puzzle could be that debt is squeezed out by different substitutes or non-debt tax shields. For instance, Graham (2013) suggests analyzing the apparently conservative debt policy, taking into account whether non-debt tax shields substitute for interest deductions. Examples of such non-debt tax shields include depreciation, investment tax credits, or loss carry-forwards. Companies have significant incentives to permanently defer or avoid taxes, usually without transparency, and they may prefer alternative tax shields to debt for different reasons (Doidge and Dyck, 2015). Following Kolay et al. (2013), firstly, they are less costly. In this regard, while debt requires costly interest payments, numerous non-debt tax shields do not require any additional outlays for the firm. Secondly, they do not restrict the firm through debt covenants, which are likely to generate high transaction costs. Thirdly, non-debt tax shields frequently exploit provisions in the accounting rules that allow the firm to reduce taxes without affecting the income statement, thus favouring management of accounting earnings. Finally, some alternative debt tax shields have a relatively larger return on investment, especially with the proliferation of thin capitalization rules in many jurisdictions.

DeAngelo and Masulis (1980) pioneered the analysis of the relevance of non-debt tax substitutes within corporate capital structures. Surprisingly, Bradley et al. (1984) found that debt is positively related to non-debt tax shields proxied by depreciation and investment tax credits, in contrast to the prediction of DeAngelo and Masulis (1980). Furthermore, the findings by Titman and Wessels (1988) do not provide support for an effect on leverage ratios arising from non-debt tax shields. In the view of Graham (2013), a positive relation between debt and non-debt tax shields (as measured by depreciation and investment tax credits) may appear if a firm invests heavily and borrows to invest. In the same vein, Minton and Wruck (2001) stated that non-debt tax shields might have a positive relationship with

debt conservatism, as the latter is related to companies that invest more. As Kolay et al. (2013) point out, a mechanical positive relation of this kind overwhelms and makes unobservable any substitution effect between debt and non-debt tax shields. Along this line, small and medium enterprises (SMEs) capital structure is analyzed by Abor and Biekpe (2009).

There are many non-tax-based explanations for corporate debt policy, such as firm size, profitability, asset collateral, managerial entrenchment and private benefits, financial flexibility, information asymmetry between managers and outside investors, product market and industry effects, growth options and expected costs of financial distress. With respect to firm size, for instance, there is an expectation that large firms typically have higher debt capacity because they are viewed as being less opaque and less risky than small firms (Hecht, 2019; Admati et al., 2018; Oyelakin, 2020). Some of the explanatory variables described later attempt to capture some of these rationales for corporate debt policy.

Indeed, the empirical evidence on the LLP is large but an attempt is made to summarize the empirical capital structure research in Table 2 below, including discussion of the economic mechanisms driving corporate borrowing.

Table 2: Empirical review of capital structure studies including the low-leverage puzzle

Sn	Study	Methodology	Main Findings
1	Abor (2008)	Sample consists of publicly quoted firms, large unquoted firms and small and medium enterprises (SMEs) in Ghana. Panel data regression techniques were used for the study	Quoted and large unquoted firms exhibit significantly higher debt ratios than do SMEs; and there is no significant difference between capital structures of publicly quoted firms and large unquoted firms. In addition, firm-specific factors that influence capital structure decisions include firm age, size, asset structure, profitability, risk and managerial ownership
2	Hartmann-Wendels, Stein and Stoter (2012)	Using a sample of 80,000 German firms over the period of 1973-2008, the authors used OLS pooled regressions to examine the determinants of leverage Graham's marginal tax rate approach was used to capture the tax effects on capital structure	A significant positive relationship exists between the marginal tax benefit of debt and the debt ratio of German firms. After controlling for conventional leverage determinants, the study finds that a 10% increase in marginal tax benefit of debt at the corporate level (investor level) causes a 1.5% (1.6%) increase in debt ratio, ceteris paribus. This positive relation was also shown to be present in various alternative specifications (such as changes in debt levels or net increase of debt) and in a partial adjustment model

continued next page

Table 2 Continued

Sn	Study	Methodology	Main Findings
3	Strebulaev and Yang (2013)	Sample: US non-financial companies in Centre for Research in Securities Prices (CRSP) Compustat data base for period 1962-2009. Zero leverage firms are firms with zero book debt; i.e. both short- and long-term debt equals zero. OLS regressions and Logit regressions were used	Puzzling evidence that a substantial number of large public non-financial US firms follow a zero-debt or almost zero-debt policy. On average, 10.2% of such firms have zero leverage and almost 22.0% have less than 5.0% book leverage ratio. Neither industry nor size can fully explain such behaviour. More surprising is the presence of a large number of these that pay dividends. Zero-leverage dividend paying firms are more profitable, pay higher taxes and have higher cash balances than their proxies chosen by industry and size. These firms are also more liberal in their dividend payout than their proxies, and thus payout ratio is relatively independent of leverage
4	Gathogo and Ragui (2014)	Sample firms include public quoted firms, large unquoted firms and SMEs in Kenya. Panel data regression techniques were used	Firm-specific factors exert the following influences on capital structure choice viz: size (+ve), age (+ve), profitability (-ve), liquidity (-ve), cost of debt (-ve), business risk (- ve) and industry type (-ve)
5	Begenau and Salomao (2019)	Examined financing decisions of US public quoted firms under a dynamic trade-off model The study used dynamic panel data models	Large mature firms finance with debt and payout equity during booms. Smaller unprofitable firms must deal with higher financing frictions because they are riskier and at the same time have higher funding needs. Small firms adhere to procyclical financing policy for both debt and equity. Large firms generally substitute between debt and equity over financing cycles
6	Antill and Grenadier (2019)	US public firms using dynamic models of optimal capital structure in the presence of default costs	The off-equilibrium threat of costly reorganization can exert downward pressure on leverage with liquidation in equilibrium. If reorganization is less efficient than liquidation, the reorganization option reduces shareholders wealth ex ante
7	Elkamhi and Salerno (2020)	Examined Canadian public firms using a dynamic trade-off model of capital structure	The authors found that pre-default costs are, on average, equal to 6.5% of firm value per year, which translates into approximately 5.5% of ex ante firm value. Accounting for pre-default costs significantly improves the portability of the trade-off model

Source: Author's review of literature

4. Analytical framework

Design/approach

This study builds on an earlier empirical work by the researcher (Paseda, 2016) where the economic mechanisms driving capital structure decisions of Nigerian quoted firms were examined. Motivated by earlier related studies (Devos et al., 2012; Strebulaev and Yang, 2013; Attaoui et al., 2021) on debt conservatism and their careful measures of debt conservatism based on fractiles of leverage distributions across sample firms, this study sort market leverage ratios of Nigerian firms from lowest to highest and extracted those firm-years with ratios not greater than 40%.

Firm years with market leverage ratios of zero correspond to zero leverage behaviour – the extreme version of the low leverage behaviour – and those years with non-zero market leverage ratios up to 40% are the remaining elements of the debt conservatism phenomenon. Collectively, the defined debt conservatism phenomenon constitutes more than 70% of the initial observations. For robustness checks, the low-leverage thresholds were later modified to reflect the situation where actual leverage ratios were below the theoretical optimal ratios estimated from book leverage and market leverage regressions.

Population and sample

Nigerian quoted non-financial firms with low leverage ratios for the period 1999-2019 constitute the target population for this study. The start year 1999 was selected to coincide with the commencement of the democratic (political) regime in Nigeria, labelled the fourth republic. The start year, 1999, also coincided with the passage of the Investments and Securities Act. The year 2019 was chosen as end-year in an attempt to update the evidence as much as possible. The number of listed equities as at December 2019 was 160. Equities are listed under 20 broad industrial sectors.

Financial services firms are excluded from the sample because they are subject to specific rules (e.g. Banks and Other Financial Institutions Act – BOFIA, 1991) and their characteristic high-leverage nature of financing is severely affected by exogenous factors (Miller, 1995; 2005). Therefore, following empirical pattern (such as Rajan and Zingales, 1995), the research focuses exclusively on non-financial

corporations. There is stratification of sample in terms of companies selected for the study as shown in Table 3. The researcher is of the opinion that the sample is a representative data and there is no reason to believe that any sample selection biases affected the results. Initially, all firms are targeted for inclusion but only those whose financial statements were available for the study period were retained in the final sample.

The packaging and textiles sectors could not be included in the final sample selection because most of the firms in that sector have missing financial data for more than five years within the study period, so that a five-year financial summary from any of the firms' available statements could not be used to derive data for the study variables.

Table 3: Sample of study by sector

S/N	Sector	Population	Sample	Sample-to-population (%)
1	Agriculture	6	4	66
2	Aviation/Airline	2	1	50
3	Automobile and Tyre	3	2	66
4	Breweries	7	3	43
5	Building Materials	7	3	43
6	Chemical and Paints	9	4	44
7	Computer	6	1	17
8	Conglomerate	8	4	50
9	Construction/Real	6	3	50
10	Engineering	3	1	33
11	Food and Beverages	18	6	33
12	Health Care	12	5	42
13	Hotels and Tourism	4	1	25
14	Industrial/Domestic	10	4	40
15	Oil and Gas	9	5	56
16	Packaging	8	0	0
17	Publishing	4	2	50
18	Road Transport	1	1	100
19	Textiles	3	0	0
	TOTAL	126	50	40

Source: Underlying data from the Nigerian Stock Exchange factbooks

Out of these 50 sample firms for the study period 1999-2019, the researcher identified the firm-years where the market debt ratios did not exceed 40% cut-off, motivated by the distribution of leverage ratios. 737 observations out of 1,050 panel data were captured, representing over 70% of the broader sample firm-years.

Model specification

The implicit model can be expressed as follows:

Model I: Low leverage ratios in relation to firm-level variables

$$D_{it} = f(MTR_{it}, DMS_{it,} NDTS_{it,} SIZE_{it,} TANG_{it,} GROW_{it,} VOL_{it,} PROF_{it,}$$

$$QUICK_{it,} RD_{it,} UNQ_{it,} DEF_{it,} MKTTIM_{it,} DIV_{it,} AGE_{it,} RSI_{it,}$$

$$RSI_{it,} UNR_{it,} RAT_{it}) \quad (1)$$

Table 4 provides definitions of the abbreviated explanatory variables. D_it is the debt ratio. These variables are motivated from the empirical capital structure literature (e.g., Rajan and Zingales, 1995; Frank and Goyal, 2003; 2008; 2009; Paseda, 2016; Lotfaliel, 2020).

Explicitly, with X as vector of explanatory variables,

$$D_{it} = \beta_0 + \beta_x X_{it} + \varepsilon_{it} \quad (2)$$

H_{01}: $\beta_{MTR} = 0$; H_{11}: $\beta_{MTR} \neq 0$. Trade off theory especially predicts $0 < \beta_{MTR} < 1$.

H_{02}: $\beta'_s = 0$; alternatively, H_{12}: $\beta'_s \neq 0$.

Pecking order theory predicts $-1 < \beta_{PROF} < 0$, $-1 < \beta_{QUICK} < 0$, and if size and age are positively correlated with profitability, then $-1 < \beta_{SIZE} < 0$, and $-1 < \beta_{AGE} < 0$ hold as well.

where D_{it} represents the leverage measure for firm *i* at time *t*. For all the variables, except expected inflation, the subscripts *it* can be interpreted that each exogenous factor is for firm *i* at time *t*. The independent variables could be taken contemporaneously or lagged one period. Both methods are acceptable in empirical corporate finance.

Within the context of capital structure adjustment and adjustment speed for low-levered firms (e.g., Gan et al., 2020), the empirical specification is:

$$\Delta D_{it} = a + b_{TA}(D^*_{it} - D_{it-1}) + \varepsilon_{it} \quad (3)$$

From the LHS, ΔD_{it} is the change in debt ratio for firm *i* at time *t* (i.e., D_{it}-D_{it-1}),

D_{it} is the observed or actual leverage, D_{it}^{*} is the target debt ratio obtained through regression of debt ratio on some predetermined covariates such as firm-level attributes as stated in equation (1) or in vector-form equation (4) below. $D_{it\text{-}1}$ is the lagged debt ratio, which also appears on the left hand side (LHS) as the value subtracted from a contemporaneous debt ratio.

$$D_{it}^{*} = \beta_0 + \boldsymbol{\beta_i X_{it}} + \mu_i + \mu_t + \varepsilon_{it} \tag{4}$$

Where D_{it}^{*} is the target leverage ratio. Attaoui et al. (2021) demonstrate that zero or low leverage can be an optimal debt policy in a static trade-off model with ambiguity averse agents. X_{it} is the vector of predictor variables or covariates. β_0 is the intercept, which represents the debt level where the values of all the predictor variables are zero. Equations (2) and (4) are similar except for the addition of the unobserved firm-specific effect (μ_i) and the unobserved time-specific firm-invariant effect (μ_t) in equation (4). ε_{it} is the error term - a well-behaved Gaussian white noise that is uncorrelated with the X_{it}. However, Wooldridge (2019) provides a technique that allows the random error term to correlate with the covariates.

b_{TA}>0 implies target adjustment while b_{TA}<1 implies positive adjustment costs. The speed of adjustment (SOA) is a declining function of adjustment costs (Hecht, 2019).

From equation (3), both intercept and error terms are expected to have a mean value of zero. Thus, (3) can be re-written as:

$$D_{it}\text{-}D_{it-1} = b_{TA}(D_{it}^{*} - D_{it-1}) \tag{5}$$

$$D_{it} = D_{it-1} + b_{TA}(D_{it}^{*} - D_{it-1}) \tag{6}$$

Collecting like terms reduces (6) into equation (7) below

$$D_{it} = (1 - b_{TA})D_{it-1} + b_{TA}D_{it}^{*} \tag{7}$$

Substituting (4) into (7) yields:

$$D_{it} = (1 - b_{TA})D_{it-1} + b_{TA}\beta_0 + b_{TA}\boldsymbol{\beta_i X_{it}} + \mu_i + \mu_t + \varepsilon_{it} \tag{8}$$

Substituting $\delta = (1 - b_{TA})$ and $\gamma_j = b_{TA}\,\boldsymbol{\beta_i}$ for j= 0,1,…,J yields

$$D_{it} = \delta D_{it-1} + \gamma_0 + \gamma_j \boldsymbol{X_{it}} + \mu_i + \mu_t + \varepsilon_{it} \quad (9)$$

(1- δ) is the speed of adjustment (SOA)

Debt ratio may be defined as "the ratio of total liabilities to total liabilities plus equity". This measure is equivalent to the "total liabilities to assets ratio" being advocated in Welch (2011; 2015). At least three measures of debt ratio are possible, namely: Book leverage, Market leverage capturing only financial liabilities (ML_{1t}) and Market leverage capturing all liabilities in the balance sheet (ML_{2t}). ML_{1t} is the financial leverage ratio while ML_{2t} is the total leverage ratio. Specifically, the ML1t is the key reference for low-leverage phenomenon. All the chosen leverage measures are stock-based methods.

Model II: Quantile regression

Quantile regression entails specifying the equation:

$$Y_{it} = X`_{it}\,\theta(U_{it}) + \alpha_i \quad (10)$$

Where $t = 1,2,\ldots,T;\ i = 1,2,\ldots, N;$ X_{it} is a vector of covariates or explanatory variables for firm *i* in period *t* including: age, firm size, marginal tax rate, profitability, liquidity, uniqueness, tangible assets, non-debt tax shields, growth, dividend payout, relationship-specific investments, unionization ratio, earnings volatility, assets' riskiness, financing deficit, market timing and rating. U_{it} and α_i are unobservable variables. αi captures fixed effects, which are perceived to be location shift variables – the effects are assumed to be constant across all quantiles. This assumption is defensible because of fixed firm attributes across time (Gwatidzo et al., 2016).

Let $\tau \in (0,1)$ denote quantiles of the distribution of firm leverage, such that the function $X'\theta(\tau)$ strictly increases in τ. We are interested in estimates of (τ) i.e. heterogeneous effects of regressors on (τ); $\theta(\tau)$. $\theta(\tau)$ is estimated in two steps. The first step estimates $\hat{\alpha i}$ using mean regression-based estimators such as OLS in first differences. This follows the assumption that $\hat{\alpha i}$ is constant across all quantiles – pure location shifters. The second step uses $\hat{\alpha i}$ to obtain measures of firm leverage that are purged of fixed effects $\hat{y}it : \hat{y}it = yit - \hat{\alpha i} \cdot \hat{y}it$ will then be regressed on covariates, using panel quantile regression methods, to obtain $\hat{\theta}(\tau)$. Equation (1) remains the empirical model to be estimated.

Because of space constraint, all the explanatory variables are defined in Table 4. The expected signs of the regression parameters (β's) are stated in column five of Table 4. The motivation for the regressors in light of empirical literature are also discussed.

Definition of explanatory variables

Table 4: Determinants of capital structure and their expected signs and magnitudes

S/N	Explanatory Variable	Definition	Indication / Proxy	Expected Sign	Expected Magnitude
1	DMS	Debt maturity structure defined as ratio of short-term debt to total debt liabilities	Short-term debt access or refinancing flexibility	+	$0 < \beta_{DMS} < 1$
2	MTR	Marginal tax rate; Tax expense divided by Earnings before tax	Effect of debt tax shield	+	$0 < \beta_{MTR} < 1$
3	NDTS	Non-debt tax shield, (Depreciation+ Investment tax credit)/ Total assets less current liabilities	Substitute (or complement) for the debt tax shield	-	$-1 < \beta_{NDTS} < 0$
4	TANG	Tangible assets defined as Property, Plant and Equipment (PPE) divided by total assets	Collateral, a measure of debt capacity	+/-	$-1 < \beta_{TANG} < 1$
5	GROWSL	Growth opportunities, measured by the change in annual revenue of firms	Growth	-	$-1 < \beta_{GROWSL} < 0$
6	GROW	The ratio of market-to-book value of the firm, which is equivalent to market-to-book value of equity for pure equity streams	Growth and market-based performance	-	$-1 < \beta_{GROW} < 0$
7	SIZE	Size defined as the natural logarithm of sales (LNS)	Size effect	+	$0 < \beta_{SIZE} < \infty$
8	VOL	Volatility of earnings defined as the standard deviation of operating earnings (EBIT) scaled by operating earnings (Choi and Richardson, 2016)	Business risk. This is distinct from systematic risk (Akintola-Bello and Adedipe, 1983).	-	$-1 < \beta_{VOL} < 0$

continued next page

Table 4 Continued

S/N	Explanatory Variable	Definition	Indication / Proxy	Expected Sign	Expected Magnitude
9	PROF	Defined by ROCE or ROA = Earnings before Interest and Taxes/ Total Assets less current liabilities	Profitability	+/-	$-1 < \beta_{PROF} \leq 1$
10	QUICK	A stricter measure of liquidity relative to current ratio. Quick ratio is defined as current assets less inventory divided by current liabilities	Liquidity	+/-	$-1 < \beta_{QUICK} \leq 1$
11	RD	Research and development plus other intangible assets/ (Total Assets – Current Liabilities)	Asset Uniqueness or intangibility	-	$-1 < \beta_{RD} < 0$
12	UNQ	Dummy variable for product uniqueness. It takes the value of one if the firm is in computer, semiconductors, chemicals, airlines and other sensitive industries	Asset uniqueness or product uniqueness or industry uniqueness	-	$-1 < \beta_{UNQ} < 0$
13	DEF	Financing deficit = change in total assets + dividends - profit after tax, or net operating cash inflows minus net cash flow for investing activities scaled by EBIT	Adverse selection in external financing (Lambrecht and Myers, 2017; Adelegan et al., 2021)	+	$0 < \beta_{DEF} \leq 1$ OR $\beta_{DEF}=\beta_{PO}= 1$
14	MKTTIM	Market timing variable, an offshoot of the behavioural story for value premium in equity returns (DeBondt and Thaler 1985). Measured as the product of market-to-book ratio and the financing deficit	Market timing. The market timing hypothesis is that firms tend to reduce their debt levels when they raise substantial capital at the time equity market is perceived to be more favourable	-	$-1 < \beta_{MKTTIM} < 0$

continued next page

Table 4 Continued

S/N	Explanatory Variable	Definition	Indication / Proxy	Expected Sign	Expected Magnitude
15	DIV	Dividend payout ratio defined as Dividends divided by profit after tax (PAT) or Dividend per share (DPS) divided by Earnings per share (EPS)	(1) Asymmetric information. Low payout firms will prefer debt over equity financing; (2) Effect of personal taxes – relative advantage of dividend to interest income	-	$-1 < \beta_{DIV} < 0$
16	RAT	Rating dummy as proxy for debt market access; one if the firm is rated and zero if the firm is unrated	Rated firms are predicted to be more highly levered than their unrated counterparts	+	$0 < \beta_{RAT} < 1$
17	AGE	Ln(Number of years since incorporation)	Impact of the firm's age on financing decisions; AGE may also be correlated with SIZE	+	$0 < \beta_{AGE} < 1$
18	RSI	Relationship-specific investments (RSI) measured by the ratio of "Bought-in goods and services (BIGS)" to Depreciation	Product-input market interaction. BIGS links the input and product markets of a firm and thus proxies for RSI with suppliers and customers	-	$-1 < \beta_{RSI} < 0$
19	UNR	Unionization ratio as measure of bargaining power of employees; Measured as the natural log of value-added per employee	Bargaining power of employees. Recent evidence indicates that unionization affects agency conflicts and corporate policies (Kim, et al., 2021)	-	$0 < \beta UNR < 1$

Source: Author

Hypotheses

In the spirit of Devos et al. (2012) and similar studies, the specific hypotheses for the low-leverage phenomenon are three, viz: the managerial entrenchment hypothesis, which suggests that entrenched managers resist possibilities for performance scrutiny or pressure arising from better governance mechanisms and follow a low-levered policy that does not commit the firm to disgorge cash; the *tax exhaustion hypothesis* that applies to loss-making firms who definitely do not have tax incentives to borrow

as there are no profits to shield from taxation and lenders perceive them as bad credit risks; the *financing constraints hypothesis*, which contends that low-levered firms are small, young, unrated, have little or no collateralizable assets and make fewer investments.

If the managerial entrenchment hypothesis is correct, then a low-levered policy increases with marginal tax rate, debt maturity structure (proxy for refinancing flexibility), size, tangible assets, liquidity (proxy for free cash flow), and firm age. In other words, firms with entrenched managers would follow a conservative debt policy based on these firm-level attributes that suggest higher debt capacity ("contrarian behaviour"). The predictor firm-level attribute for the tax exhaustion argument is profitability. Low or negative profitability rationalizes low-debt policy. Finally, the financing constraints hypothesis rests on firm level attributes such as size, age, rating (proxy for access to debt markets), tangible assets and growth. In other words, both managerial entrenchment and financing constraints hypotheses are not mutually exclusive.

H_0: $\beta_{MTR},\beta_{DMS},\beta_{SIZE},\beta_{TANG},\beta_{QUICK},\beta_{AGE} > 0$	{Managerial entrenchment does not hold}
H_1: $\beta_{MTR},\beta_{DMS},\beta_{SIZE},\beta_{TANG},\beta_{QUICK},\beta_{AGE} < 0$	{Managerial entrenchment exists}
H_0: $\beta_{PROF} > 0$	{Tax exhaustion does not hold}
H_1: $\beta_{PROF} < 0$	{Tax exhaustion exists}
H_0: $\beta_{RAT},\beta_{SIZE},\beta_{TANG},\beta_{GROW},\beta_{AGE} > 0$	{Financing constraints rejected}
H_0: $\beta_{RAT},\beta_{SIZE},\beta_{TANG},\beta_{GROW},\beta_{AGE} < 0$	{Financing constraints accepted}

Model estimation and evaluation

There are many potential estimation techniques for studies of this nature. For this study, the baseline estimation technique is the Ordinary Least Squares (OLS). The OLS estimator is appealing and consistent when the regressors are exogenous – and by the Gauss-Markov theorem – optimal in the class of unbiased linear estimators when the error terms are homoscedastic and serially uncorrelated. Under these strict conditions, the OLS method provides minimum-variance mean-unbiased estimation when the errors have finite variances. OLS is the maximum likelihood estimator under the additional assumption that the errors are normally distributed.

However, since these conditions are rarely fulfilled in empirical data, then the alternative estimators (that attempt to overcome the OLS weaknesses of bias and inefficiency) such as the Two-Stage Least Squares (2SLS), Generalized Method of Moments (GMM), Robust Least Squares (RBLS), Auto-regressive Distributed Lag Models

(ARDL) and Quantile Regression applied for robustness checks and reliability. For instance, the 2SLS would require finding appropriate instruments for the exogenous variables, which are neither correlated with the error term nor with any of the exogenous variables.

In this respect, Flannery and Hankins (2010) contend that a traditional instrumental variables approach becomes an unviable option in most areas of corporate finance where finding reliable instruments can be very difficult. This challenge would thus necessitate the alternative of using the Arellano-Bond dynamic GMM panel data model, which addresses more efficiently the problem of endogeneity and simultaneity, while simultaneously accommodating dynamic capital structure modelling. The advantage of the GMM over the traditional 2SLS model is that instead of focusing on weak instruments, it optimally exploits all the linear moment restrictions specified by the model. Dynamic panel methods further permit robust inference of lagged dependent variables in the presence of unobserved heterogeneity (Ezeoha and Botha, 2012).

There are two versions of the Arellano-Bond dynamic panel data GMM – the difference – GMM and the system-GMM. In the absence of residuals not having second-order serial correlation, the difference-GMM uses the lagged exogenous variables' values as legitimate instruments for the first-difference lagged dependent variable (Flannery and Hankins, 2010). The system-GMM uses the differencing similar to the difference-GMM plus the lagged exogenous variables' first differences as instruments embodied in an equation of the level-variables. This becomes necessary to obviate potential loss of efficiency in models estimated in first differences using lagged instruments in levels. Extensive reviews of some of these methodological issues in corporate finance are provided by Strebulaev and Whited (2012) and Mitton (2021).

The choice of GMM is motivated by three considerations, *viz*: the nature of the study dataset (small dataset); the possibility of the variance of the time-invariant unobservable firm-specific effects increasing relative to the variance of the serially uncorrelated time-varying disturbance term (εit); and the likelihood of the auto-regressive parameter (D_(i,t-1)) or the adjustment speed (SOA) approaching unity.

Limitation of the methodology

This study is limited to the examination of the economic mechanisms driving low-leverage behaviour of 50 Nigerian non-financial corporations for the period of 21 years (1999-2019). It is possible that a longer period investigation might be more illuminating. Further, there is possibility of extending the sample to other African countries to know the extent to which the study's results can be generalized, perhaps on the basis of institutional features of developing countries.

5. Results

Empirical results

This section provides the empirical results of the determinants of low-levered policy of Nigerian quoted firms. The summary statistics and the correlation matrix are presented at the appendix.

The firm covariates can be ranked in this order in terms of their mean values, namely: relationship-specific investments, size, unionization ratio, growth opportunities, age, liquidity as measured by acid-test or quick ratio, tangible assets, dividend payout ratio, market timing, profitability, marginal tax rate, financing deficit, rating or debt market access, earnings volatility, non-debt tax shields, and research and development (R&D) (see Appendix 1). Among the firm factors, the R&D showed the least dispersion around the mean as can be observed from its standard deviation. The mean ratio of market leverage I to market leverage II is 36%. This implies that 64% of corporate liabilities of the sample firms are non-financial, and which may include trade credits/account payables, accrued operational expenses. In other words, non-negotiated or spontaneous sources of finance are substantial components of the corporate balance sheets. Thus, trade credits and other operational liabilities are vital sources of financing Nigerian non-financial corporations.

Also, a closer scrutiny of the 737 firm-year observations indicates negative profitability in 79 firm-observations, 126 no-dividend-payout observations, 577 quick ratio-below-unity observations (i.e., 160 liquid firm-cases), 684 marginal tax-paying firm observations (MTR > 2%), 453 tangible assets-to-total-assets ratio > 50% observations and 624 market-to-book value ≥ unity observations. If only firm observations with quick ratio greater than or equal to unity are considered, there will be 160 observations of low-levered firms. Out of the 160, only 18 correspond to no-dividend payments.

Both trade-off and pecking order models make predictions regarding the relationship between leverage and mentioned covariates. In addition, given the relative frequency of observations on profitability, liquidity, tax payments, tangible assets and growth opportunities, there is greater evidence of *managerial conservatism* over *tax exhaustion* as the primary economic mechanism behind low-leverage phenomenon.

The correlation matrix gives a first guarantee that the explanatory variables are not highly correlated, so that multicollinearity is not a serious concern. Except for size and age (R_{SA}) and size and unionization ratio (R_{SU}) with correlation coefficients of 53% and 78%, respectively, which is unsurprising as older firms tend to be bigger and may have more empowered employees - all other variables are only moderately associated.

From Table 5, for low-debt policy firms, debt is a declining function of the debt maturity structure, marginal tax rate, non-debt tax shields, tangible assets, growth opportunities, profitability, liquidity, industry or product uniqueness, dividend payout policy, firm age, relationship-specific investments and unionization ratio. Marginal tax rate, non-debt tax shields, growth, profitability, liquidity, uniqueness, relationship-specific investments and employee bargaining are economically significant variables. The statistically significant variables that exert negative influences on leverage include marginal tax rate, growth opportunities, profitability, liquidity, age and employee bargaining. The factors that exert positive influences on debt usage for these low-levered firms include size, volatility of earnings, asset riskiness (proxied by research and development), financing deficit, market timing and debt market access (proxied by rating). All the positive impact variables are economically significant except volatility and asset riskiness. Size, asset riskiness, financing deficit, market timing and debt market access are statistically significant. In other words, firms that implement low leverage policy have lower tangible assets, lower growth opportunities, lower liquidity and profitability, pay lower taxes and dividends, are younger and have higher debt market access. All the 17 sectors covered in this study display the low-leverage phenomenon. In other words, conservative capital structure is present in the following sectors, namely: food and beverages, health care/medical, publishing, oil and gas, breweries, chemical and paints, aviation/airline, agriculture, building materials, computers, conglomerate, construction, engineering, automobile and tyres, hotels and tourism, industrial/domestic and transportation. The significant market leverage lag to the order of one in the estimation techniques is indicative of the potency of dynamic panel models to the analysis of the low leverage phenomenon. Some of these findings are consistent with those of Fama and French (2002), Lemmon et al. (2008), Lemmon and Zender (2010), and DeAngelo and Roll (2015).

Further analysis of this low-leverage behaviour along the relative sizes of the covariates can be done using quantile regression as reported in Table 6 .

Regression results

Table 5: Low leverage regressions designed to uncover low-levered firms attributes
Panel 1 (all low-levered firms)

Variables	Low Leverage (ML1) Regressions						
	ML1 Regressions						
	(OLS)	(GMM)	(GMM)	(GMM)	(ARDL)	(2SLS)	(RBLS)
ML1(-1)			1.0030***	1.0030***	1.0030***	1.002925***	1.0015***
			(3085.13)	(3080.750)	(4020.2)	(4636.397)	(7622.449)
DMS	-0.032845	-0.032845		4.89E-05			3.77E-05
	(-1.4831)	(-1.4831)		(0.3197)			(0.4849)
MTR	-0.0453**	-0.0453**	-1.10E-05	-1.54E-05			0.000124*
	(-2.2024)	(-2.2024)	(-0.0584)	(-0.0736)			(1.7129)
NDTS	-0.0312	-0.0312	-0.000219	-0.000156			5.07E-05
	(-1.0342)	(-1.0342)	(-1.2676)	(-0.8763)			(0.4791)
TANG	-0.007215	-0.007215	8.77E-05	0.000116			9.78E-05
	(-0.4261)	(-0.4261)	(0.9414)	(1.3395)			(1.645160)
GROW	-0.0069***	-0.0069***	7.11E-06	4.61E-06			3.93E-06
	(-6.5605)	(-6.5605)	(1.2765)	(0.8568)			(1.0274)
SIZE	0.0081**	0.0081**	-1.47E-05	-3.10E-05		1.78E-06	-3.05E-06
	(2.0541)	(2.0541)	(-0.6977)	(-1.1491)		(0.5127)	(-0.2197)
VOL	0.003186	0.003186		-0.000162			-0.000112
	(0.1283)	(0.1283)		(-1.0763)			(-1.2812)
PROF	-0.02931*	-0.02931*	-7.60E-05	-0.000130			-0.0002***
	(-1.6967)	(-1.6967)	(-0.8034)	(-1.3292)			(-2.9750)

continued next page

Table 5 Continued

Variables	Low Leverage (ML1) Regressions						
	ML1 Regressions						
	(OLS)	(GMM)	(GMM)	(GMM)	(ARDL)	(2SLS)	(RBLS)
QUICK	-0.02302**	-0.02302**	0.000137	0.000148*	0.00014**	0.000133***	8.18E-05**
	(-2.4522)	(-2.4522)	(1.5796)	(1.7089)	(2.1701)	(2.5796)	(2.4723)
RD	0.0993**	0.0993**	-0.0003*	-0.000291			4.34E-06
	(2.1135)	(2.1135)	(-1.6398)	(-1.5955)			(0.0263)
UNQ	-0.010082	-0.010082		-4.36E-05			-9.54E-06
	(-1.0616)	(-1.0616)		(-0.6544)			(-0.2854)
DEF	0.052521***	0.052521***		-0.000108			-6.50E-05
	(2.6547)	(2.6547)		(-0.8100)			(-0.9324)
MKTTIM	0.005815	0.005815		5.42E-05**		3.07E-05	3.46E-05
	(0.9437)	(0.9437)		(2.1229)		(1.0715)	(1.5982)
DIV	-0.011016	-0.011016		1.47E-05			2.47E-07
	(-0.8314)	(-0.8314)		(0.173392)			(0.0053)
AGE	-0.015037	-0.015037		5.90E-05	-0.0001*		5.37E-05
	(-1.2778)	(-1.2778)		(0.7977)	(-1.6947)		(1.2990)
RSI	-4.33E-05	-4.33E-05		1.08E-06			7.70E-07
	(-0.2490)	(-0.2490)		(1.1748)			(1.2631)
UNR	-0.0163***	-0.0163***		1.66E-05			-6.68E-06
	(-3.9333)	(-3.9333)		(0.5576)			(-0.4554)
RAT	0.0826***	0.0826***	0.000218**	0.000205*	0.0002***	0.0002***	7.50E-05**
	(7.3414)	(7.3414)	(2.0048)	(1.7721)	(2.7000)	(2.9059)	(1.8328)

continued next page

Table 5 Continued

Variables	Low Leverage (ML1) Regressions						
	ML1 Regressions						
	(OLS)	(GMM)	(GMM)	(GMM)	(ARDL)	(2SLS)	(RBLS)
Constant	0.2689***	0.2689***		0.000111			-0.000118
	(4.9677)	(4.9677)		(0.3088)			(-0.6120)
Adjusted R^2	0.260791	0.260791	0.999967	0.999968	0.999967	0.999967	0.766830
Durbin-Watson		1.962503	1.983744	1.962503	1.962095	1.962503	
Observations	737	737	737	737	737	737	737

NB: The dependent variable is the market leverage ratio I (ML1). The explanatory variables are debt maturity structure (DMS), marginal tax rate (MTR), non-debt tax shields (NDTS), tangibility of assets (TANG), growth opportunities(GROW), size of the firm (SIZE), volatility of earnings before interest and taxes (VOL), firm profitability (PROF), liquidity measured by quick or acid-test ratio (QUICK), assets' riskiness measured by research and developments and other intangible assets (RD), industry or product uniqueness (UNQ), dividend payout ratio (DIV), age of the firm (AGE), financing deficit (DEF), relationship-specific investments (RSI), rating dummy as proxy for debt market access(RAT), employee bargaining power measured by unionization ratio (UNR) and market timing (MKTTIM) as defined in Table 4. Coefficients, t-statistics (in parentheses) and statistical significance are reported. Standard errors adjust for heteroscedasticity and clustering at the firm level. All variables capture firm-specific attributes. To resolve the issue of outliers, most of the variables with outlier presence were winsorized at the 5^{th} and 95^{th} percentiles corresponding to lower and upper values, respectively. The estimation techniques were Ordinary Least Squares (OLS), Generalized Method of Moments (GMM), two-stage least squares (2SLS), auto-regressive distributed lag (ARDL) and robust least squares (RBLS).
* indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%.

Table 6: Determinants of low-leverage behaviour of profitable firms
Panel 2: Quantile regression of capital structure determinants for low-levered firms

Variables	Market Leverage (ML1) Regressions						
	ML1 Regressions						
	(Q10)	(Q25)	(Q50)	(Q75)	(Q80)	(Q90)	Remarks
DMS	-0.0320	-0.08735***	-0.035480	0.0225	0.011485	-0.040117	-ve/+ve
	(-1.2785)	(-3.4594)	(-1.1760)	(0.4771)	(0.2844)	(-0.6991)	
MTR	-0.028875	-0.050831	-0.042555	-0.0623***	-0.0510**	-0.037607	-ve
	(-0.8305)	(-1.2114)	(-0.7867)	(-3.1796)	(-2.3102)	(-1.4707)	
NDTS	0.004247	-0.030774	-0.021952	-0.0391	-0.043734	-0.029002	-ve
	(0.1936)	(-0.8321)	(-0.5282)	(-1.0215)	(-0.8230)	(-0.3404)	
TANG	0.002229	-0.005256	-0.024573	0.0146	0.023579	0.002387	+ve/-ve
	(0.1248)	(-0.2378)	(-1.2361)	(0.6217)	(1.05011)	(0.0943)	
GROW	-0.000462	-0.000762	-0.0041***	-0.00879***	-0.0095***	-0.0120***	-ve
	(-0.7474)	(-1.0737)	(-4.3135)	(-8.1919)	(-8.7110)	(-11.6823)	
SIZE	-0.003583	0.004229	0.0122**	0.007431	0.003415	0.0127*	+ve/-ve
	(-0.8146)	(1.0171)	(2.4808)	(1.0051)	(0.4869)	(1.8140)	
VOL	0.011786	0.010034	0.037692	-0.0190	-0.007626	0.0309	+ve/-ve
	(0.4959)	(0.3213)	(1.0317)	(-0.57586)	(-0.1929)	(0.3717)	
PROF	-0.016080	-0.030488*	-0.0580**	-0.02596	-0.009959	0.011837	-ve
	(-1.2284)	(-1.8994)	(-2.5629)	(-1.03096)	(-0.3364)	(0.4402)	
QUICK	-0.018032*	-0.021392**	-0.0262**	-0.027189	-0.02749	-0.0307**	-ve
	(-1.7472)	(-1.9696)	(-2.1975)	(-1.5317)	(-1.4927)	(-2.2898)	
RD	0.015053	0.046841	0.0866**	0.028950	0.046647	0.100797	+ve
	(0.4715)	(1.4539)	(2.0250)	(0.5013)	(0.5717)	(0.4426)	

continued next page

Table 6 Continued

Variables	Market Leverage (ML1) Regressions						
	ML1 Regressions						
	(Q10)	(Q25)	(Q50)	(Q75)	(Q80)	(Q90)	Remarks
UNQ	-0.005482	-0.002592	-0.0282***	0.002079	0.007339	0.000525	-ve/+ve
	(-0.6964)	(-0.2426)	(-2.5951)	(0.1305)	(0.4083)	(0.0171)	
DEF	-0.001420	0.013582	0.07363*	0.0968***	0.1036***	0.1069***	-ve/+ve
	(-0.0831)	(0.6392)	(1.7958)	(3.2193)	(2.9650)	(2.5733)	
MKTTIM	0.002294	-0.000716	-0.0009	0.004686	-0.000448	-0.003128	+ve/-ve
	(0.5354)	(-0.1508)	(-0.1406)	(0.6723)	(-0.0650)	(-0.3933)	
DIV	0.001645	-0.001520	0.0107	-0.0201	-0.034562	-0.04292**	-ve
	(0.1515)	(-0.1035)	(0.6445)	(-0.9199)	(-1.5399)	(-1.9993)	
AGE	0.011124	0.009662	-0.0240	-0.027593	-0.0328*	-0.0226*	-ve
	(0.5900)	(0.5063)	(-1.6390)	(-1.4125)	(-1.9061)	(-1.7005)	
RSI	4.23E-05	0.000154	-0.0005***	-5.00E-06	-0.000246	-0.0006*	-ve
	(0.3408)	(0.9695)	(-2.6090)	(-0.0180)	(-0.8715)	(-1.9016)	
UNR	-0.001016	-0.01663***	-0.0219***	-0.0145*	-0.004655	-0.0161**	-ve
	(-0.2030)	(-3.0610)	(-2.8970)	(-1.7190)	(-0.6353)	(-2.4546)	

continued next page

Table 6 Continued

Variables	Market Leverage (ML1) Regressions						
	ML1 Regressions						
	(Q10)	(Q25)	(Q50)	(Q75)	(Q80)	(Q90)	Remarks
RAT	0.029770*	0.077519***	0.1125***	0.08881***	0.0972***	0.0740***	+ve
	(1.9011)	(3.1210)	(6.6855)	(5.1930)	(5.3175)	(4.2428)	
Constant	0.079999	0.169785**	0.2780***	0.34432***	0.3733***	0.385834***	+ve
	(1.2458)	(2.2974)	(3.8887)	(3.3641)	(3.8705)	(3.5816)	
Adjusted R^2	0.040843	0.112830	0.193408	0.219987	0.227069	0.224395	

NB: The dependent variable is the market leverage ratio I (ML1). The explanatory variables are debt maturity structure (DMS), marginal tax rate (MTR), non-debt tax shields (NDTS), tangibility of assets (TANG), growth opportunities(GROW), size of the firm (SIZE), volatility of earnings before interest and taxes (VOL), firm profitability (PROF), liquidity measured by quick or acid-test ratio (QUICK), assets' riskiness measured by research and development and other intangible assets (RD), industry or product uniqueness (UNQ), dividend payout ratio (DIV), age of the firm (AGE), financing deficit (DEF), relationship-specific investments (RSI), rating dummy as proxy for debt market access(RAT), employee bargaining power measured by unionization ratio (UNR) and market timing (MKTTIM) as defined in Table 4. Coefficients, t-statistics (in parentheses) and statistical significance are reported. Standard errors adjust for heteroscedasticity and clustering at the firm level. All variables capture firm-specific attributes. To resolve the issue of **outliers**, most of the variables with outlier presence were winsorized at the 5^{th} and 95^{th} percentiles corresponding to lower and upper values respectively. The results are reported at the Q10, Q25, Q50, Q75, Q80 and Q90 of the leverage distributions. * indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%.

From Table 6, the effects of profitability and liquidity on leverage are both economically and statistically similar across all quantiles. The negative relationship corroborates findings in Gathogo and Ragui (2014) and Gwatidzo et al. (2016). Most of the results confirm earlier results displayed in Table 5, with magnitudes varying across quantiles. The profitable low-levered firms confirm the assertion by Graham (2000) that many profitable firms seem to be under-levered. The profitable firms are concentrated in the following sectors, namely: food and beverages, breweries, aviation/airline, oil and gas, and healthcare sectors.

From Table 7, the following variables exert positive influences on debt conservatism (that is, increase the tendency towards low leverage): marginal tax rate (MTR), non-debt tax shield, growth, profitability, quick, uniqueness, age, relationship-specific investments, and employee bargaining power. The following variables reduce the tendency towards low leverage: debt market access, market timing, financing deficit, asset riskiness, firm size and tangible assets.

Table 8 echoes the results obtained earlier in Table 7, albeit with varying magnitudes of impact across different quantiles of the distribution. The impact of dividend payout on debt conservatism deserves special mention. Dividend payout exerts an economically and statistically significant positive influence on conservatism only at the 10th quantile of dividend payout distribution. In this study, there are 611 firm-level observations corresponding to dividend payout, suggesting that 83% of the low-levered firms pay dividends. The results are robust to alternative cut-off rates for the low-levered policy and alternative estimations of the volatility of earnings as indicator of distress risk. Taken together, the results pose a challenge for the trade-off theory of capital structure but support the pecking order.

Table 7: Determinants of conservative behaviour among low-levered firms
Panel 3 – (1-ML1t) regressions for all low-levered firms

Variables	Debt Conservatism (1-ML1) Regressions						
	(1-ML1) Regressions						
	(OLS)	(2SLS)	(ARDL)	(RBLS)	(Q50)	(GMM)	Remarks
(1-ML1)(-1)			1.002958	1.0016***			
			(4020.228)	(7624.04)			
DMS			-4.74E-05	-2.64E-05	0.035480		
			(-0.3217)	(-0.3402)	(1.1760)		
MTR	0.0476**	0.0476**	2.71E-05	-0.00015**	0.042555	0.0552***	+ve
	(2.3180)	(2.3180)	(0.1971)	(-2.0428)	(0.7867)	(2.5845)	
NDTS	0.039507	0.039507	0.000132	-2.35E-05	0.0220		+ve
	(1.3328)	(1.3328)	(0.6588)	(-0.2229)	(0.5282)		
TANG	0.004014	0.004014	-0.000100	-9.91E-05*	0.0246		-ve
	(0.2388)	(0.2388)	(-0.8876)	(-1.6697)	(1.2361)		
GROW	0.00685***	0.00685***	-4.31E-06	-3.54E-06	0.0041***	0.0069***	+ve
	(6.4761)	(6.4761)	(-0.5944)	(-0.9264)	(4.3135)	(6.0991)	
SIZE	-0.0092**	-0.0092**	2.96E-05	3.86E-06	-0.01219**	-0.0087**	-ve
	(-2.3608)	(-2.3608)	(1.1246)	(0.2789)	(-2.4808)	(-2.3669)	
VOL	0.0015	0.0015	0.000163	8.65E-05	-0.037692		
	(0.0605)	(0.0605)	(0.9820)	(0.9914)	(-1.0317)		
PROF	0.0337**	0.0337**	0.000133	0.000185***	0.05804**	0.0408**	+ve
	(1.9756)	(1.9756)	(1.1532)	(3.0529)	(2.5629)	(2.4521)	
QUICK	0.02092**	0.02092**	-0.0002**	-8.77E-05***	0.026213**	0.01848**	+ve
	(2.2520)	(2.2520)	(-2.1701)	(-2.6487)	(2.1975)	(2.4184)	

continued next page

Table 7 Continued

Variables	Debt Conservatism (1-ML1) Regressions						
	(1-ML1) Regressions						
	(OLS)	(2SLS)	(ARDL)	(RBLS)	(Q50)	(GMM)	Remarks
RD	-0.1026**	-0.1026**	0.000356	-4.69E-05	-0.0866**	-0.0929***	-ve
	(-2.1840)	(-2.1840)	(1.1333)	(-0.2834)	(-2.0250)	(-2.5775)	
UNQ	0.0089	0.0089	4.38E-05	1.23E-05	0.0282***		+ve
	(0.9360)	(0.9360)	(0.6909)	(0.3695)	(2.5951)		
DEF	-0.0556***	-0.0556***	0.000117	5.37E-05	-0.0736*	-0.05298**	-ve
	(-2.8218)	(-2.8218)	(0.8876)	(0.7715)	(-1.7958)	(-2.3479)	
MKTTIM	-0.005134	-0.005134	-5.36E-05	-3.69E-05*	0.000913	-0.005804	-ve
	(-0.8348)	(-0.8348)	(-1.3088)	(-1.7096)	(0.1406)	(-1.1228)	
DIV	0.0144	0.0144	-9.02E-06	-1.52E-05	-0.010730		
	(1.1005)	(1.1005)	(-0.1024)	(-0.3266)	(-0.6445)		
AGE	0.018528*	0.018528*	-6.76E-05	-5.20E-05	0.0240	0.017345	+ve
	(1.6055)	(1.6055)	(-0.8631)	(-1.2605)	(1.6390)	(1.2102)	
RSI	0.000120	0.000120	-1.03E-06	-6.37E-07	0.0005***		+ve
	(0.7199)	(0.7199)	(-0.8911)	(-1.0472)	(2.6090)		
UNR	0.0156***	0.0156***	-1.98E-05	6.66E-06	0.0219***	0.01472***	+ve
	(3.7987)	(3.7987)	(-0.7117)	(0.4541)	(2.8968)	(3.6642)	

continued next page

Table 7 Continued

Variables	Debt Conservatism (1-ML1) Regressions						
	(1-ML1) Regressions						
	(OLS)	(2SLS)	(ARDL)	(RBLS)	(Q50)	(GMM)	Remarks
RAT	-0.0837***	-0.0837***	-0.0002***	-6.54E-05	-0.1125***	-0.0833***	-ve
	(-7.4474)	(-7.4474)	(-2.6999)	(-1.6043)	(-6.6855)	(-5.8869)	
Constant	0.7625***	0.7625***	-0.0034***	-0.001049***	0.7220***	0.7861***	
	(15.2946)	(15.2946)	(-7.6477)	(-4.4289)	(10.1015)	(14.71496)	
Adjusted R^2	0.259557	0.259557	0.999967	0.771745	0.193408	0.2612	

NB: The dependent variable is one minus market leverage ratio I (1-ML1). ML1 is the financial debt ratio, defined as the ratio of financial liabilities to sum of financial liabilities and equity, using market values. The explanatory variables are debt maturity structure (DMS), marginal tax rate (MTR), non-debt tax shields (NDTS), tangibility of assets (TANG), growth opportunities(GROW), size of the firm (SIZE), volatility of earnings before interest and taxes (VOL), firm profitability (PROF), liquidity measured by quick or acid-test ratio (QUICK), assets' riskiness measured by research and developments and other intangible assets (RD), industry or product uniqueness (UNQ), dividend payout ratio (DIV), age of the firm (AGE), financing deficit (DEF), relationship-specific investments (RSI), rating dummy as proxy for debt market access(RAT), employee bargaining power measured by unionization ratio (UNR) and market timing (MKTTIM) as defined in Table 4. Coefficients, t-statistics (in parentheses) and statistical significance are reported. Standard errors adjust for heteroscedasticity and clustering at the firm level. All variables capture firm-specific attributes. To resolve the issue of **outliers**, most of the variables with outlier presence were winsorized at the 5^{th} and 95^{th} percentiles corresponding to lower and upper values, respectively. OLS, 2SLS, ARDL, RBLS, Quantile (median), and GMM estimations are reported. * indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%.

Table 8: Determinants of conservative leverage behaviour – quantile regression results
Panel 4 – (1-ML1) quantile regressions

	Dependent Variable: Debt conservatism measured as 1- Market Leverage (1-ML1)						
	Debt conservatism Regressions						
	(Q10)	(Q25)	(Q50)	(Q75)	(Q80)	(Q90)	Remarks
DMS	0.0401	-0.0225	0.035480	0.0874***	0.0654***	0.031963	+ve
	(0.6991)	(-0.4771)	(1.1760)	(3.4594)	(2.8012)	(1.2785)	
MTR	0.037607	0.0623***	0.042555	0.050831	0.0556	0.028875	+ve
	(1.4707)	(3.1796)	(0.7867)	(1.2114)	(1.3943)	(0.8305)	
NDTS	0.029002	0.039140	0.0220	0.030774	0.0191	-0.004247	
	(0.3404)	(1.0215)	(0.5282)	(0.8321)	(0.6476)	(-0.1936)	
TANG	-0.002387	-0.014574	0.0246	0.005256	0.004707	-0.002229	-ve
	(-0.0943)	(-0.6217)	(1.2361)	(0.2378)	(0.2270)	(-0.1248)	
GROW	0.0120***	0.0088***	0.0041***	0.000762	-4.30E-05	0.000462	+ve
	(11.68226)	(8.1919)	(4.3135)	(1.0737)	(-0.0666)	(0.7474)	
SIZE	-0.01268*	-0.007431	-0.01219**	-0.004229	-0.002320	0.003583	-ve
	(-1.8140)	(-1.0051)	(-2.4808)	(-1.0171)	(-0.5753)	(0.8146)	
VOL	-0.030863	0.019003	-0.037692	-0.010034	0.011447	-0.011786	
	(-0.3717)	(0.5759)	(-1.0317)	(-0.3213)	(0.4490)	(-0.4959)	
PROF	-0.011837	0.025956	0.05804**	0.0305*	0.0350**	0.016080	+ve
	(-0.4402)	(1.0310)	(2.5629)	(1.8994)	(2.3846)	(1.2284)	

continued next page

Table 8 Continued

	Dependent Variable: Debt conservatism measured as 1- Market Leverage (1-ML1)						
	Debt conservatism Regressions						
	(Q10)	(Q25)	(Q50)	(Q75)	(Q80)	(Q90)	Remarks
QUICK	0.0307**	0.027189	0.026213**	0.0214**	0.0215*	0.0180*	+ve
	(2.2898)	(1.5317)	(2.1975)	(1.9696)	(1.8400)	(1.7472)	
RD	-0.1008	-0.028950	-0.0866**	-0.046841	-0.0188	-0.015053	_-ve
	(-0.4426)	(-0.5013)	(-2.0250)	(-1.4539)	(-0.5890)	(-0.4715)	
UNQ	-0.000525	-0.002079	0.0282***	0.002592	0.0051	0.005482	+ve
	(-0.0171)	(-0.1305)	(2.5951)	(0.2426)	(0.5092)	(0.6964)	
DEF	-0.10689***	-0.0968***	-0.0736*	-0.013582	-0.012160	0.001420	-ve
	(-2.5733)	(-3.2193)	(-1.7958)	(-0.6392)	(-0.6550)	(0.0831)	
MKTTIM	0.003128	-0.004686	0.000913	0.000716	0.0006	-0.002294	
	(0.3933)	(-0.6723)	(0.1406)	(0.1508)	(0.1522)	(-0.5354)	
DIV	0.0429**	0.020061	-0.010730	0.001520	0.0029	-0.001645	+ve
	(1.9993)	(0.9199)	(-0.6445)	(0.1035)	(0.2199)	(-0.1515)	
AGE	0.0226*	0.027593	0.0240	-0.0097	-0.0151	-0.011124	+ve
	(1.7005)	(1.4125)	(1.6390)	(-0.5063)	(-0.8067)	(-0.5900)	
RSI	0.0006*	5.00E-06	0.0005***	-0.0002	-0.0001	-4.23E-05	+ve
	(1.9016)	(0.0180)	(2.6090)	(-0.9695)	(-0.7130)	(-0.3408)	

continued next page

Table 8 Continued

	Dependent Variable: Debt conservatism measured as 1- Market Leverage (1-ML1)						
	Debt conservatism Regressions						
	(Q10)	(Q25)	(Q50)	(Q75)	(Q80)	(Q90)	Remarks
UNR	0.0161**	0.014517	0.0219***	0.0166***	0.0131**	0.001016	+ve
	(2.4546)	(1.7190)	(2.8968)	(3.0610)	(2.5094)	(0.2030)	
RAT	-0.0740***	-0.0888***	-0.1125***	-0.0775***	-0.0449**	-0.0298*	-ve
	(-4.2428)	(-5.1929)	(-6.6855)	(-3.1210)	(-2.3570)	(-1.9011)	
Constant	0.6142***	0.6557***	0.7220***	0.8302***	0.8689***	0.9200***	+ve
	(5.7012)	(6.4061)	(10.1015)	(11.2341)	(12.1187)	(14.3275)	
Adjusted R^2	0.224395	0.219987	0.193408	0.112830	0.096961	0.040843	

NB: The dependent variable is (1-ML1). ML1t captures financial debt ratio, defined as the ratio of financial liabilities to sum of financial liabilities and equity, using market values. The explanatory variables are debt maturity structure (DMS), marginal tax rate (MTR), non-debt tax shields (NDTS), tangibility of assets (TANG), growth opportunities (GROW), size of the firm (SIZE), volatility of earnings before interest and taxes (VOL), firm profitability (PROF), liquidity measured by quick or acid-test ratio (QUICK), assets' riskiness measured by research and development and other intangible assets (RD), industry or product uniqueness (UNQ), dividend payout ratio (DIV), age of the firm (AGE), financing deficit (DEF), relationship-specific investments (RSI), rating dummy as proxy for debt market access(RAT), employee bargaining power measured by unionization ratio (UNR) and market timing (MKTTIM) as defined in Table 4. The coefficients, t-statistics (in parentheses) and statistical significance are reported. Standard errors adjust for heteroscedasticity and clustering at the firm level. All variables capture firm-specific attributes. To resolve the issue of **outliers**, most of the variables with outlier presence were winsorized at the 5th and 95th percentiles corresponding to lower and upper values respectively. The results are reported at the Q10, Q25, Q50, Q75, Q80 and Q90 of the leverage distributions. * indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%.

Robustness checks

What happens to the results if the measure of debt under-utilization is adjusted to reflect different thresholds or benchmarks such as the optimal leverage ratios derived from GMM regression estimates? Are the results sensitive to a different measure of leverage such as a book measure or even a market measure of leverage that embodies both financial and non-financial liabilities as numerator? How sensitive are the results to macroeconomic conditions measured by growth in gross domestic product?

With respect to debt conservatism thresholds and alternative leverage measures

The theoretical book leverage ratio for 1,050 firm-year observations (full sample) could be derived from this specification:

$$BL_{it} = 0.4741 - 0.1606DMS_{it} + 0.0524\,MTR_{it} + 0.2032NDTS_{it} - 0.0831TANG_{it} + 0.0053\,GROW_{it} + 0.2678VOL_{it} - 0.1523\,QUICK_{it} + 0.0812\,RD_{it} + 0.0346UNQ_{it} + 0.2444DEF_{it} - 0.0445\,MKTTIM_{it} - 0.0599DIV_{it} + 0.0757AGE_{it} + 0.0019\,RSI_{it}$$

This yields the low leverage firm-year observations of 633.

The theoretical market leverage ratio I (financial liabilities only) for 1,050 firm-year observations (full sample) could be derived from this specification:

$$ML1_{it} = 0.4153 - 0.0777MTR_{it} - 0.0184\,GROW_{it} - 0.1201QUICK_{it} + 0.2989\,RD_{it} + 0.0483UNQ_{it} + 0.0695DEF_{it} - 0.1584DIV_{it} + 0.0441AGE_{it} + 0.0007RSI_{it} + 0.0892RAT_{it}$$

which yields firm-year observations of 818.

The theoretical market leverage ratio II (financial liabilities plus non-financial liabilities) for 1,050 firm-year observations (full sample) could be derived from this specification:

$$ML2_{it} = 0.2736 - 0.0696\,DMS_{it} + 0.1829NDTS_{it} - 0.0788TANG_{it} - 0.0241GROW_{it} + 0.0182\,SIZE_{it} + 0.1154VOL_{it} - 0.0954QUICK_{it} + 0.0881UNQ_{it} + 0.0792DEF_{it} - 0.1842DIV_{it} + 0.0745AGE_{it} + 0.0015RSI_{it} - 0.0252UNR_{it}$$

with low-leverage firm-year observations of 560.

Debt conservativism, in terms of the book measure of leverage, increases with debt maturity structure, tangibility, firm size, liquidity, market timing, and dividend payout ratio, but declines with marginal tax rate, growth prospects, volatility, asset riskiness, financing deficit, age, relationship-specific investments and unionization ratio. Debt conservative firms when gauged by market leverage measure are those firms with higher marginal tax rate, non-debt tax shelters, growth prospects, tangible assets, liquidity, dividend payout ratios, unionization ratio and shorter debt maturity. In terms of firm size, the evidence is consistent with larger firms borrowing more than small firms. In terms of age, older firms borrow more than small firms. In terms of growth opportunities, firms with growth options use debt more conservatively than mature firms, consistent with the pursuit of financial flexibility.

With respect to macroeconomic cycle

During the study period of 1999-2019, there were periods of slow downs in economic growth rate, especially 1999, 2015, 2016, 2017, 2018 with growth rates of 0.58%, 2.65%, -1.62%, 0.81% and 1.92%, respectively. Thus, there was possibility that such slow downs could impact on credit supply and by extension exert downward pressure on corporate leverage ratios. In other words, debt conservativism may be an outcome of external macro-financial conditions rather than micro-financial policy of firms.

The inclusion of GDP growth rate shows that economic conditions impact positively on firms' debt usage, notwithstanding the leverage definition. However, the growth rate was not statistically significant.

Implications of the empirical results

Theoretical implications

Both pecking order and trade-off theories make specific predictions regarding the impact of firm-specific attributes on debt ratios. Based on the signs and magnitude of the coefficients from the results, it is safe to say that the pecking order theory outperforms the trade-off model in explaining the capital structure of low-levered firms and the determinants of debt conservatism consistent with Kalantonis et al. (2021). More specifically, the (negative) signs of the coefficients of profitability, liquidity, tangibility, and age are consistent with the *pecking order* while the *trade-off* predicts otherwise. The negative albeit insignificant relationship between leverage and non-debt tax shields is consistent with the debt substitution hypothesis of DeAngelo-Masulis (1980). The availability of alternative tax shelters reduces the tax-incentives for low-levered firms to borrow, contrary to result obtained for zero-levered firms in Paseda and Adedeji (2020). The negative relationship between leverage and tangibility indicates that debt capacity defined by the quantum of collateralizable assets does not explain debt usage, at least for low-levered firms. Given that profitable firms are also caught in the low-leverage web, this is evidence in support of *managerial conservatism*. If profitable and liquid firms with more tangible assets follow more conservative debt usage, then there is a huge scope for agency problems whereby corporate managers indulge glamorous managerial lifestyle, fund empire building projects (over-investment problems) and pursue excessive perk consumption. 159 of the 737 firm-year observations correspond to liquid situation of the low-levered firms. This represents 21.6% of the entire observations. The dangers of financial slack and agency costs of equity as emphasized by Jensen (1986) and others should not be ignored by portfolio investors who may be considering any of these low-levered firms.

The foregoing results have important implications with respect to the theoretical determinants of capital structure choice, *viz*: expected costs of financial distress, availability of investment or growth opportunities, managerial entrenchment and private benefits, asset riskiness or intangibility, firm size, asset collateral, information asymmetry between corporate insiders and outside investors, financial flexibility, product market and industry effects (such as industry concentration and product uniqueness), profitability, cash flows and liquidity, and earnings or cash flow volatility.

The results can be examined in the context of the three low-leverage hypotheses restated here:

H_0: $\beta_{MTR},\beta_{DMS},\beta_{SIZE},\beta_{TANG},\beta_{QUICK},\beta_{AGE} > 0$ {Managerial entrenchment does not hold}

H_1: $\beta_{MTR},\beta_{DMS},\beta_{SIZE},\beta_{TANG},\beta_{QUICK},\beta_{AGE} < 0$ {Managerial entrenchment exists}

H_0: $\beta_{PROF} > 0$ {Tax exhaustion does not hold)

H_1: $\beta_{PROF} < 0$ {Tax exhaustion exists}

H_0: $\beta_{RAT}, \beta_{SIZE}, \beta_{TANG}, \beta_{GROW}, \beta_{AGE} > 0$ {Financing constraints rejected}

H_0: $\beta_{RAT}, \beta_{SIZE}, \beta_{TANG}, \beta_{GROW}, \beta_{AGE} < 0$ {Financing constraints accepted}

It is evident that the managerial entrenchment hypothesis holds given the economically and statistically significant inverse coefficients of marginal tax rate, debt maturity structure, tangible assets, liquidity and age. This result contradicts that of Devos et al. (2012) who argue that managerial entrenchment is not responsible for low-levered policy.

To make inference on the tax exhaustion hypothesis, firm-level data for firms with negative profitability were used. The elasticity of leverage with respect to profitability was found to be negative, in tandem with the tendency for lenders to restrict provision of finance to loss-making firms and lack of motivation for tax-shield pursuit by loss-makers.

On the financing constraints hypothesis, there is weak evidence that firms with access to debt markets (proxied by ratings) use debt conservatively. Rather, debt use increases with rating without prejudice to the free-rider problem in securities markets. In all cases, larger firms borrow more than small firms.

Practical implications

The results of the regression analysis need to be taken with a large grain of salt, as capital structure decisions are endogenous to other financing and investment decisions. While the investment decisions remain the primary drivers of value, the conditions in every market would continue to dictate the direction of corporate capital structures as firms seek to minimize financing costs and at the same time match the tenor of finance to the assets. Nonetheless, the reported correlations in Table 6 are indicative of the association between market leverage and firm attributes.

On the tax impact on borrowing behaviour, conservatism increases with marginal tax rate contrary to the popular wisdom that aggressive borrowing will make firms more tax efficient. Given the presence of non-debt tax shelters, the conservative firms do not consider debt usage as a primary source of tax planning. The non-debt tax shelters effectively act as substitutes consistent with Graham and Tucker (2006).

On growth opportunities' impact on borrowing, firms are conscious of the value of financial flexibility in prosecuting future investment opportunities that may arise. Thus, managers would use debt cautiously to preserve the "war chest" to undertake those future projects, including acquisitions when opportunities arise (Myers 1977; Barclay et al, 2006). On average, 84% of the low-levered firms have valuable growth opportunities.

As argued by the proponents of the pecking order theory, more profitable and liquid firms use debt less than their less profitable and liquid counterparts. Internal finance is cheaper because issuance costs is zero and managers do not need to prepare documentation to access it. More importantly, internal equity is least prone to the problem of asymmetric information relative to debt and external equity.

On product uniqueness, firms are seen to be more debt-conservative if they belong to a sensitive industry or have unique products such that employees, customers and suppliers may suffer huge inconveniences if such firms should go bankrupt as a result of inability to meet contractual obligations. Specifically, industries with production technologies that are labour-intensive and their products require unique skills should use debt conservatively to preserve the value of human capital in an economy with high unemployment, almost zero unemployment insurance and absence of employment protection. Public and private insurance arrangements in Nigeria, as in many developing countries, rarely cater for workers in case of unemployment (Akintola-Bello, 1985; 1986; 2019; Dang et al., 2021).

The analysis does not delve into quantification of the tax benefits, which the firms bypass by reason of their conservative debt usage (Paseda, 2020). The results also clearly indicate the existence of managerial risk aversion. Managerial risk aversion is a significant agency problem for profitable firms with free cash flow. Managers should increase debt in capital structure until the marginal tax benefits equilibrate the estimated *ex-ante* financial distress costs. The results obtained in this study contradict the recent Spanish evidence provided in Clemente-Almendros and Sogorb-Mira (2018). If the free cash flow is not being distributed to investors by way of dividend as found in roughly 10% of the firm-year observations, then the corporate managers are destroying value. Adelegan, et al. (2021) find that leverage does not influence the corporate payout policies of Nigerian manufacturing firms.

Notwithstanding, competitive managerial market forces both within and outside these firms may serve to constrain managers faced with temptations to slack or consume excessive perquisites.

6. Summary and conclusion

A recurring view in the empirical corporate finance literature is that firms are not sufficiently levered as they ought to be based on the potential tax benefits of debt obtainable if the firms borrow more - the so-called debt conservatism or low -leverage puzzle. This study belongs to the cohort of empirical work that investigates conservatism in corporate debt policy from a developing country perspective.

This study investigates the economic mechanisms driving conservative capital structures in Nigeria. The dataset is unique in that it covers a broad sample of firms across 17 industries, while combining information on factors such as the marginal tax rate, non-debt tax shields, growth, tangible assets, size, earnings volatility, asset riskiness, profitability, liquidity, financing deficit, uniqueness, dividend payout, age, relationship-specific investments, employee bargaining and debt market access with information on market leverage. With these data, this study argues that firms that follow low-leverage policy are more profitable and liquid, have higher tangible assets, higher growth opportunities, pay higher dividends, have higher relationship-specific investments, higher employee bargaining powers, are older and have higher debt market access. The 17 sectors covered in this study have firms that display the low-leverage phenomenon. Overall, these results are consistent with managerial conservatism whereby rational risk-averse managers with power utility functions make corporate decisions in their long-run self-interest, subject to governance constraints and sources and uses of funds.

Conservative firms follow a pecking order behaviour. Financial slack proxied by high liquidity (measured by the quick ratio) permits them to finance an important portion of their capital expenditures internally. Further, debt conservatism is not static but also transitory in the sense that a firm may abandon conservatism for a few years before a return to increased borrowing. In terms of book leverage, for instance, conservatism was least pronounced among sample firms in 2004 with less than 50% of the firms being financially conservative. Conservatism was most pronounced in 2008 and 2009, with nearly 80% of the sample firms using debt cautiously below their predicted (optimal) debt levels. That phenomenon may be attributable to the financial panic that accompanied the global financial crisis of 2007-2009. Further, financial conservatism is not an industry phenomenon and many low-leverage firms have high marginal tax rates.

The low-leverage hypotheses of managerial entrenchment and tax exhaustion

find strong empirical support, both confirming earlier studies (Minton and Wruck, 2001; Byun et al., 2021; DeAngelo, 2021; Attaoui et al., 2021) and contradicting some others (Molina, 2005; Almeida and Philippon, 2007; Devos et al., 2012; Clemente-Almendros and Sogorb-Mira, 2018). In addition, the influence of trade credits and related operational liabilities on conservative debt usage cannot be ruled out because a substantial 66% of the total liabilities is represented by non-debt liabilities. This implies that trade credit and related spontaneous sources of funds constitute fertile research topic for understanding corporate finance trends in Nigeria.

Notes

1. The generous funding for this study from the African Economic Research Consortium (AERC) and the School of Oriental and African Studies (SOAS) of the University of London is gratefully acknowledged. Further, the author is grateful for the constructive comments of the participants at the *AERC-SOAS Inclusive Financial Services Policy Platform*, most especially during the session on *Corporate Finance in Africa* held on 9th September 2021. Professors Hong Bo, Victor Murinde, Olatundun Adelegan and Dr Tolu Lawal get special thanks for their penetrating comments and suggestions that have greatly improved the quality of this work. The usual disclaimer on any residual errors applies.

References

Abor, J. 2008. Determinants of the capital structure of Ghanaian firms. AERC Research Paper 176. Nairobi: African Economic Research Consortium.

Abor, J. and Biekpe, N. 2006. "An empirical test of the agency problems and capital structure of South African quoted SMEs". *SA Journal of Accounting Research*, 20(1): 51–65.

Abor, J. and Biekpe, N. 2009. "How do we explain the capital structure of SMEs in Sub-Saharan Africa? Evidence from Ghana". *Journal of Economic Studies*, 36(1): 83–87.

Adelegan, O.J. 2000. Impact of growth prospects, leverage and firm size on dividend behaviour of corporate firms in Nigeria. 3rd Annual Conference on the Centre for Study of African Economies on Opportunities in Africa: Micro-evidence on firms and households from April 09th–10th, 2000 at St Catherine's College, University of Oxford. Abstract published on www.csaeconference2000.org.

Adelegan, O.J. 2002. "The pecking order hypothesis and corporate dividend payout: Nigerian evidence". *African Review of Money, Finance and Banking,* 75–94, Supplementary Issue of 'Savings and Development'.

Adelegan, O.J. 2003. "An empirical analysis of the relationship between cash flow and dividend changes in Nigeria". *African Development Review*, June, 15(1):35–49.

Adelegan, O.J. 2009. Price reactions to dividend announcements on the Nigerian stock market. African Economic Research Consortium (AERC) Research Paper No.188,1–32.

Adelegan, O.J., Adeyemo, K., Adejuwon, J. and Adewale, T. 2021. "Determinants of dividend policy of manufacturing firms in Nigeria". *AERC-SOAS Inclusive Financial Services Policy Platform*, 08-09 September.

Admati, A.R., DeMarzo, P.M., Hellwig, M.F., Pfleiderer, P. 2018. "The leverage ratchet effect". *Journal of Finance*, 73(1): 145–198.

Akintola-Bello, O. 1985. "Insurance industry and the Nigerian economy". *Savings and Development,* 9(1): 57–77.

Akintola-Bello, O. 1986. "Investment behaviour of insurance companies in Nigeria". *Savings and Development*, 10(1): 379–407.

Akintola-Bello, O. 2004. *The Nigerian stock market: Behaviour and performance.* Lagos: Arbitrage Consulting Group.

Akintola-Bello, O. 2019. *The CBN and us: Reviewing Governor Emefiele's five-year strategic policy thrust.* Abuja: Arbitrage Consult.

Akintola-Bello, O. and Adedipe, A. 1983. "Estimating the cost of equity of Nigerian firms". *The Nigerian Journal of Economic and Social Studies,* 20(1): 99–106.

Almeida, H. and Philippon, T. 2007. "The risk-adjusted cost of financial distress". *Journal of Finance*, 62(6): 2557−2586.

Amah, P.N. 2014. "Revisiting the effects of tax and bankruptcy costs on financing decisions among publicly listed firms in Nigeria". *Fifth Annual International Conference on the Nigerian Financial System and Inclusive Growth and Development,* 1:183−193.

Amah, P.N. and Ezike, J.E. 2013. "Investigating the relationship between corporate growth and debt policy: The Nigerian evidence". *Journal of Money, Investment and Banking*, 27: 99−113.

Antill, S. and Grenadier, S.R. 2019. "Optimal capital structure and bankruptcy choice: Dynamic bargaining versus liquidation". *Journal of Financial Economics*, 133(1): 198−224.

Attaoui, S., Cao, W., Duan, X. and Liu, H. 2021. "Optimal capital structure, ambiguity aversion and leverage puzzles". *Journal of Economic Dynamics and Control,* 129, (August), 104176. https://doi.org/10.1016/j.jedc.2021.104176.

Baker, M., and Wurgler, J. (2002) "Market timing and capital structure," *Journal of Finance,* 57(1): 1−32

Barclay, M.J., Morellec, E. and Smith, C.W. 2006. "On the debt capacity of growth options". *Journal of Business*, 79:37−59.

Barclay, M.J. and Smith, C.W. 2020. "The capital structure puzzle: Another look at the evidence". *Journal of Applied Corporate Finance,* 32(1): 80−91.

Beck, T., Demirguc-Kunt, A. and Maksimovic, V. 2008. "Financing patterns around the world: Are small firms different?" *Journal of Financial Economics,* 89(3): 467−487.

Begenau, J. and Salomao, J. 2019. "Firm financing over the business cycle". *Review of Financial Studies,* 32(4): 1235−1274.

Blouin, J., Core, J.E. and Guay, W. 2010. "Have the tax benefits of debt been overestimated?" *Journal of Financial Economics,* 98:195−213.

Bradley, M., Jarrell, G.A. and Kim, E.H. 1984. "On the existence of an optimal capital structure: Theory and evidence". *Journal of Finance*, 39(3): 857−878.

Brealey, R., Myers, S. and Allen, F. 2020. *Principles of Corporate Finance*, 13th Edition. New York: McGraw-Hill Inc.

Buckley, P.J., Chen, L., Clegg, L.J. and Voss, H. 2020. "The role of endogenous and exogenous risk in FDI entry choices". *Journal of World Business,* 55(1): 101040.

Byun, S., Fuller, K., and Lin, K. 2021. "The costs and benefits associated with inventor CEOs". *Journal of Corporate Finance,* https://doi.org/10.1016/j.jcorpfin.2021.102094.

Choi, J. and Richardson, M. 2016. "The volatility of a firm's assets and the leverage effect". *Journal of Financial Economics,* 121(2): 254−277.

Clemente-Almendros, J.A. and Sogorb-Mira, F. 2018. Costs of debt, tax benefits and a new measure of non-debt tax shields: Examining debt conservatism in Spanish listed firms". *Spanish Accounting Review,* 21(2): 162−175.

Cohn, J.B., Titman, S. and Twite, G.J. 2020. "Capital structure and investor-level taxes: Evidence from a natural experiment in Europe". *SSRN Electronic Journal,* 2941957.

Dang, V.A., De Cesari, A., Phan, H.V. 2021. "Employment protection and share repurchases: Evidence from wrongful discharge laws". *Journal of Corporate Finance,* 69: 102036.

DeAngelo, H. 2021. "Corporate financial policy: What really matters?" *Journal of Corporate Finance*, 68, June, 101925.

DeAngelo, H. and Masulis, R. 1980. "Optimal capital structure under corporate and personal taxation". *Journal of Financial Economics*, 8(1): 5−29.

DeAngelo, H. and Roll, R. 2015. "How stable are corporate capital structures?" *Journal of Finance,* 70(1): 373−418.

DeBondt, W., Thaler, R. 1985. "Does the stock market overreact?" *Journal of Finance*, 40: 793−805.

DeMarzo, P.M. and He, Z. 2021. "Leverage dynamics without commitment". *Journal of Finance,* 76(3): 1195−1250.

Devos, E., Dhillon, U., Jagannathan, M. and Krishnamurthy, S. 2012. "Why are firms unlevered?" *Journal of Corporate Finance*, 18(3): 664−682.

Doidge, C. and Dyck, A. 2015. "Taxes and corporate policies: Evidence from a quasi-natural experiment". *Journal of Finance*, 70 (1): 45−89.

Dong, F., Shen, G., Jiao, Y. 2021. "Firm debt and labour share: The distribution effect of de-leverage". *China Economic Quarterly International,* 1(1): 59−71.

Elkahmi, R. and Salerno, M. 2020. "How large are pre-default costs of financial distress? Estimates from a dynamic model". *SSRN Electronic Journal* 3553063.

Ezeoha, A. 2017. "Corporate finance in Africa: The interactive impact of firm nationality and characteristics". *Review of Development Economics*, 21(3): 849−873.

Ezeoha, A. and Botha, F. 2012. "Firm age, collateral value, and access to debt financing in an emerging economy: Evidence from South Africa". *South African Journal of Economic and Management Sciences,* 15(1):55−71.

Faleye, O. 2007. "Classified boards, firm value, and managerial entrenchment". *Journal of Financial Economics,* 83(2): 501−529.

Fama, E.F. and French, K.R. 2002. "Testing trade-off and pecking order predictions about dividends and debt". *Review of Financial Studies*, 15: 1−33.

Fama, E.F. and French, K.R. 2012. "Capital structure choices". *Critical Finance Review*, 1:59−101.

Flannery, M.J. and Hankins, K.W. 2010. Estimating dynamic panel models in corporate finance. Discussion Paper, University of Florida. Available at SSRN: http://ssrn.com/abstract=1108684.

Flannery, M.J. and Rangan, K.P. 2006. "Partial adjustment toward target capital structures". *Journal of Financial Economics*, 79(3): 469−506.

Frank, M.Z. and Goyal, V.K. 2003. "Testing the pecking order theory of capital structure". *Journal of Financial Economics,* 67: 217−248.

Frank, M.Z. and Goyal, V.K. 2008. "Trade-off and pecking order theories of debt". In B.E Eckbo (ed), *Handbook of corporate finance: Empirical corporate finance.* North Holland, Amsterdam: Elsevier.

Frank, M.Z. and Goyal, V.K. 2009. "Capital structure decisions: Which factors are reliably important?" *Financial Management,* 38 (1): 1− 37.

Gan, L., Lv, W. and Chen, Y. 2020. "Capital structure adjustment speed over the business cycle". *Finance Research Letters*, https://doi.org/10.1016/j.frl.2020.101574.

Gathogo, G. and Ragui, M. 2014. "Capital structure of Kenyan firms: What determines it?" *Research Journal of Finance and Accounting*, 5(5): 118−125.

Glover, B. 2016. "The expected cost of default". *Journal of Financial Economics*, 119(2): 284−299.

Graham, J.R. 2000. "How big are the tax benefits of debts?" *Journal of Finance*, 55 (5): 1901−1941.

Graham, J.R. 2013. "Do taxes affect corporate decisions? A review". In G.M. Constantinides, M. Harris and R. Stulz (eds), *Handbook of the economics of finance*. North-Holland: Elsevier.

Graham, J.R., Hanlon, M., Shevlin, T. and Shroff, N. 2017. "Tax rates and corporate decision-making". *Review of Financial Studies*, 30(9): 3128−3175.

Graham, J.R., Leary, M.T. and Roberts, M.R. 2015. "A century of capital structure: The leveraging of corporate America". *Journal of Financial Economics,* 118(3): 658-683.

Graham, J.R. and Tucker, A.L. 2006. "Tax shelters and corporate debt policy". *Journal of Financial Economics,* 81: 563−594.

Gwatidzo, T. and Ojah, K. 2009. "Corporate capital structure determinants: Evidence from five African countries". *African Finance Journal,* 11(1):1−23.

Gwatidzo, T., Ntuli, M. and Mlilo, M. 2016. "Capital structure determinants in South Africa: A quantile regression approach". *Journal of Economic and Financial Sciences*, 9(1): 275−290.

Haddad, K. and Lotfaliel, B. 2019. "Trade-off theory and zero leverage". *Finance Research Letters*, 31(1): 165−170.

Hartmann-Wendels, T., Stein, I. and Stoter, A. 2012. Tax incentives and capital structure choice: Evidence from Germany". Deutsche Bundesbank Discussion Paper No. 18/2012.

He, Z. and Hirshleifer, D.A. 2020. "The exploratory mindset and corporate innovation". Forthcoming *Journal of Financial and Quantitative Analysis,* 1−43, DOI: https://doi.org/10.1017/S0022109020000800.

Hecht, A. 2019. "How do firms manage their interest rate exposure?" *Journal of Risk Finance,* 20(5): 501−519.

Hou, Q., Tang, X. and Teng, M. 2021. "Labour costs and financialization of real sectors in emerging markets". *Pacific-Basin Finance Journal,* 67:101547.

Islam, E. and Zein, J. 2020. "Inventor CEOs". *Journal of Financial Economics,*135(2): 505−527.

Jensen, M.C. 1986. "Agency costs of free cash flow, corporate finance and takeovers". *American Economic Review,* 76(2): 323−329.

Jensen, M.C. 1993. "The modern industrial revolution, exit, and the failure of internal control systems". *Journal of Finance*, 48(3): 831−880.

Jensen, M.C. and Meckling, W. 1976. "Theory of the firm: Managerial behaviour, agency costs and ownership structure". *Journal of Financial Economics*, 3: 305−360.

Jiang, J. and Chen, Y. 2021. "How does labour protection influence corporate risk-taking? Evidence from China". *Pacific-Basin Finance Journal,* 68: 101572.

Kalantonis, P., Kallandranis, C. and Sotiropoulos, M. 2021. "Leverage and firm performance: New evidence on the role of economic sentiment using accounting information". *Journal of Capital Market Studies*, 5(1): 96−107.

Kim, H. 2020. "How does labour market size affect firm capital structure? Evidence from large plant openings". *Journal of Financial Economics,* Available online 4 May 2020, https://doi.org/10.1016/j.fineco.2020.04.012.

Kim, J-B, Zhang, E.X. and Zhong, K. 2021. "Does unionization affect the manager-shareholder conflict? Evidence from firm-specific stock price crash risk". *Journal of Corporate Finance*, 69: 101991.

Ko, J. K. and Yoon, S. 2011. "Tax benefits of debt and debt financing in Korea". *Asia-Pacific Journal of Financial Studies,* 40: 824−855.

Kolay, M., Schallbeim, J.S. and Wells, K. 2013. A new measure for non-debt tax shields and the impact on debt policy. Unpublished Working Paper, University of Utah.

Korteweg, A. 2010. "The net benefits to leverage" *Journal of Finance,* 65(6): 2137−2170.

Lakonishok, J., Shleifer, A. and Vishny, R.W. 1994. "Contrarian investment, extrapolation, and risk". *Journal of Finance,* 49(5): 1541−1578.

Lambrecht, B.M. and Myers, S.C. 2017. "The dynamics of investment, payout and debt". *Review of Financial Studies,* 30(11): 3759−3800.

Lemmon, M., Roberts, M. and Zender, J. 2008. "Back to the beginning: Persistence and the cross section of corporate capital structure". *Journal of Finance*, 63: 1575−1608.

Lemmon, M.L. and Zender, J.F. 2010. "Debt capacity and tests of capital structure theories". *Journal of Financial and Quantitative Analysis,* 45(5): 1161−1187.

Liao, S. 2021. "The effect of credit shocks in the context of labour market frictions". *Journal of Banking and Finance,* 125: 106091.

Lotfaliel, B. 2020. "Asset variance risk premium and capital structure". *Journal of Financial and Quantitative Analysis,* 55(3):1−70.

Lundberg, C. and Lotfaliel, B. 2019. "Finite-horizon zero-leverage firms". *Applied Economic Letters,* https://doi.org/10.1080/13504851.2019.1675860.

Machokoto, M., Areneke, G. and Ibrahim, B. 2020. "Rising corporate debt and value relevance of supply-side factors in South Africa". *Journal of Business Research,* 109: 26−37.

Matsa, D.A. 2010. "Capital structure as a strategic variable: Evidence from collective bargaining". *Journal of Finance*, 65(3):1197−1232.

Miller, M.H. 1977. "Debt and taxes". *Journal of Finance*, 32: 261−276.

Miller, M.H. 1995. Do the M&M propositions apply to banks? *Journal of Banking and Finance,* 19: 483−489.

Miller, M.H. 2005. "Leverage, Nobel Prize Lecture 1990 Reprint". *Journal of Applied Corporate Finance,* 17 (1): 106−111.

Minton, B.A. and Wruck, K.H. 2001. Financial conservatism: Evidence on capital structure from low leverage firms. AFA 2002 Atlanta, Dice Centre, Working Paper, Ohio State University.

Mitton, T. 2021. "Methodological variation in empirical corporate finance". *Review of Financial Studies*, https://doi.org/10.1093/rfs/hhab030.

Modigliani, F. and Miller, M.H. 1958. "The cost of capital, corporation finance and the theory of investment". *American Economic Review*, 48: 261−296.

Modigliani, F. and Miller, M.H. 1963. "Corporate income taxes and the cost of capital: A correction". *American Economic Review,* 53: 433−443.

Molina, C.A. 2005. "Are firms underleveraged? An examination of the effect of leverage on default probabilities". *Journal of Finance*, 60(3): 1427−1459.

Myers, S.C. 1977. "The determinants of corporate borrowing". *Journal of Financial Economics,* 5: 147−175.

Myers, S.C. 1984. "The capital structure puzzle". *Journal of Finance*, 39: 575−592.

Myers, S.C. 2001. "Capital structure". *Journal of Economic Perspectives,* 15(2): 81−102.

Myers, S.C. and Majluf, N.S. 1984. "Corporate financing and investment decisions when firms have information the investors do not have". *Journal of Financial Economics,* 13:187−221.

Oyelakin, A. 2020. Essays in empirical corporate finance. PhD Thesis, Essex Finance Group, University of Essex.

Paseda, O. 2016. The determinants of capital structure of Nigerian quoted firms, PhD Thesis, Department of Finance, University of Lagos, Nigeria.

Paseda, O. 2020. "Information in the tax benefit curves of selected Nigerian quoted firms". *IOSR Journal of Economics and Finance*, 11(4S2):54−71.

Paseda, O. and Adedeji, B.S. 2020. The mystery of zero-leverage firms: Evidence from Nigerian quoted firms. *GATR Accounting and Finance Review*, 5(2): 28−55.

Rajan, R.G. and Zingales, L. 1995. "What do we know about capital structure? Some evidence from international data". *Journal of Finance*, 50(5): 1421−1460.

Scholes, M., Wolfson, M., Erickson, M., Hanlon, M., Maydew, E. and Shevlin, T. 2015. *Taxes and business strategy: A planning approach,* Fifth Edition, New Jersey: Prentice-Hall.

Soyode, A. 1978. "Financing industrial growth in Nigeria: A study of the place of debt and retained earnings". *Journal of Management*, 10(1): 26−31.

Strebulaev, I. and Whited, T.M. 2012. "Dynamic models and structural estimation in corporate finance". *Foundation and Trends in Finance*, 6:1−163.

Strebulaev, I. and Yang, B. 2013."The mystery of zero-leverage firms". *Journal of Financial* Economics, 109: 1−23.

Titman, S. and Wessels, R. 1988. "The determinants of capital structure choice". *Journal of Finance*, 43(1):1−19.

Tsur, M. 2021. "A bargaining-based model of security design". *American Economic Journal: Microeconomics,* 13(3): 443−473.

Van Binsbergen, J., Graham, J. and Yang J. 2010. "The cost of debt". *Journal of Finance*, 55: 2089−2136.

Vega-Gutierrez, P.L., Lopez-Iturriaga, F.J., Rodriguez-Sanz, J.A. 2021. "Labour market conditions and the corporate financial decision: A European analysis". *Research in International Business and Finance,* 58:101431.

Welch, I. 2011. "Two common problems in capital structure research". *International Review of Finance,* 11(1): 1−17.

Welch, I. 2015. *Corporate finance: An introduction*, Second Edition, Pearson Education.

Wooldridge, J.M. 2019. "Correlated random effects models with unbalanced panels". *Journal of Econometrics,* 211(1): 137−150.

Yartey, C.A. 2009. "The stock market and the financing of corporate growth in Africa: The case of Ghana". *Emerging Markets Finance and Trade,* 45(4): 53−68.

Yildirim, D. and Celik, A.K. 2021. "Testing the pecking order theory of capital structure: Evidence from Turkey using panel quantile regression approach". *Borsa Istanbul Review*, https://doi.org/10.1016/j.bir.2020.11.002.

Zingales, L. 2015. "Does finance benefit society". *Journal of Finance,* 70(4): 1327−1363.

Appendices

Appendix 1: Summary statistics for low-levered firms in the study

	ML1T	ML2T	DMS	MTR	NDTS	TANG	GROW	SIZE	VOL	PROF	QUICK	RD	UNQ	DEF	MKTTIM	DIV	AGE	RSI	UNR	RAT
Mean	0.127	0.355	0.735	0.261	0.115	0.608	4.213	16.181	0.156	0.264	0.788	0.026	0.548	0.170	0.423	0.472	3.769	27.086	8.207	0.160
Median	0.096	0.312	0.790	0.309	0.072	0.630	2.441	16.161	0.098	0.229	0.679	0.000	1.000	0.118	0.257	0.483	3.829	17.787	8.101	0.000
Maximum	0.405	0.989	0.995	0.580	0.777	0.990	21.147	22.492	0.895	0.912	2.904	0.721	1.000	0.992	1.893	1.000	4.564	98.156	11.917	1.000
Minimum	0.000	0.100	0.055	-1.246	0.007	0.086	-3.124	9.846	-0.079	-0.306	0.029	0.000	0.000	-0.250	-2.061	0.000	1.792	3.015	4.970	0.000
Std. Dev.	0.116	0.200	0.211	0.208	0.136	0.290	4.716	1.959	0.180	0.265	0.467	0.084	0.498	0.263	0.864	0.332	0.400	26.850	1.594	0.367
Skewness	0.662	1.020	-0.951	-3.611	2.949	-0.211	1.842	0.045	2.661	0.283	1.593	5.286	-0.194	1.066	-0.195	0.047	-1.263	1.552	0.082	1.854
Kurtosis	2.244	3.732	3.284	25.424	12.479	1.856	6.090	2.561	10.375	3.498	6.103	35.428	1.037	4.394	3.683	1.819	6.215	4.332	2.340	4.436
Observations	737	737	737	737	737	737	737	737	737	737	737	737	737	737	737	737	737	737	737	737

NB: The dependent variable is the market leverage ratio I (ML1), which captures financial liabilities only, defined as the ratio of financial liabilities to sum of financial liabilities and equity, using market values. An alternative market leverage ratio II (ML2) is the ratio of all liabilities to "liabilities plus market equity values". Debt maturity structure (DMS) is the ratio of short-term liabilities to total liabilities. The explanatory variables are as earlier defined in Table 4. The explanatory variables or covariates include marginal tax rate (MTR), non-debt tax shields (NDTS), tangibility of assets (TANG), growth opportunities(GROW), size of the firm (SIZE), volatility of earnings before interest and taxes (VOL), firm profitability (PROF), liquidity measured by quick or acid-test ratio (QUICK), assets' riskiness measured by research and development and other intangible assets (RD), industry uniqueness dummy (UNQ), financing deficit (DEF), market timing (MKTTIM), dividend payout ratio (DIV), age of the firm (AGE), rating dummy as proxy for debt market access(RAT), relationship-specific investments(RSI), and employee bargaining power/unionization ratio (UNR) all as defined in Table 4. All variables capture firm-specific attributes. To resolve the issue of outliers, most of the variables with outlier presence were winsorized at the 5th and 95th percentiles corresponding to lower and upper values, respectively.
Source: Author's estimation

Appendix 2: Correlation matrix of variables used in the study

	ML1T	DMS	MTR	NDTS	TANG	GROW	SIZE	VOL	PROF	QUICK	RD	UNQ	DEF	MKTTIM	DIV	AGE	RSI	UNR	RAT
ML1T	1.000	-0.099	-0.160	0.045	0.010	-0.352	-0.124	-0.003	-0.259	-0.083	-0.013	0.031	0.158	-0.018	-0.203	-0.066	-0.102	-0.211	0.313
DMS	-0.099	1.000	0.116	0.152	-0.228	0.052	-0.160	0.204	0.253	-0.120	-0.086	-0.016	0.024	0.055	0.183	0.042	0.344	-0.233	-0.107
MTR	-0.160	0.116	1.000	0.032	-0.127	0.090	0.192	-0.163	0.322	0.123	0.059	0.073	-0.048	0.062	0.293	-0.024	0.132	0.091	-0.034
NDTS	0.045	0.152	0.032	1.000	0.051	-0.020	-0.005	0.048	0.096	-0.199	0.025	0.078	0.146	0.087	0.017	-0.099	-0.128	-0.126	0.090
TANG	0.010	-0.228	-0.127	0.051	1.000	0.187	0.276	-0.012	-0.078	-0.398	0.186	-0.351	-0.060	0.005	0.051	0.056	-0.172	0.254	0.065
GROW	-0.352	0.052	0.090	-0.020	0.187	1.000	0.344	0.192	0.365	-0.090	0.178	-0.217	-0.031	0.348	0.275	0.211	0.150	0.268	-0.161
SIZE	-0.124	-0.160	0.192	-0.005	0.276	0.344	1.000	-0.068	0.192	0.002	0.265	-0.480	-0.084	0.104	0.299	0.528	0.270	0.777	0.149
VOL	-0.003	0.204	-0.163	0.048	-0.012	0.192	-0.068	1.000	-0.063	-0.093	-0.011	-0.062	0.191	0.042	-0.165	0.046	0.228	-0.209	-0.115
PROF	-0.259	0.253	0.322	0.096	-0.078	0.365	0.192	-0.063	1.000	0.016	-0.001	-0.122	-0.044	0.200	0.383	0.035	0.168	0.184	-0.090
QUICK	-0.083	-0.120	0.123	-0.199	-0.398	-0.090	0.002	-0.093	0.016	1.000	-0.082	0.113	-0.178	-0.066	-0.019	-0.020	0.007	0.035	0.058
RD	-0.013	-0.086	0.059	0.025	0.186	0.178	0.265	-0.011	-0.001	-0.082	1.000	-0.058	-0.033	0.012	0.089	0.174	0.094	0.256	-0.018
UNQ	0.031	-0.016	0.073	0.078	-0.351	-0.217	-0.480	-0.062	-0.122	0.113	-0.058	1.000	0.006	-0.079	-0.156	-0.219	-0.295	-0.358	-0.035
DEF	0.158	0.024	-0.048	0.146	-0.060	-0.031	-0.084	0.191	-0.044	-0.178	-0.033	0.006	1.000	0.584	-0.092	-0.080	0.022	-0.084	-0.094
MKTTIM	-0.018	0.055	0.062	0.087	0.005	0.348	0.104	0.042	0.200	-0.066	0.012	-0.079	0.584	1.000	0.041	0.025	0.046	0.060	-0.063
DIV	-0.203	0.183	0.293	0.017	0.051	0.275	0.299	-0.165	0.383	-0.019	0.089	-0.156	-0.092	0.041	1.000	0.096	0.196	0.255	-0.057
AGE	-0.066	0.042	-0.024	-0.099	0.056	0.211	0.528	0.046	0.035	-0.020	0.174	-0.219	-0.080	0.025	0.096	1.000	0.189	0.411	0.209
RSI	-0.102	0.344	0.132	-0.128	-0.172	0.150	0.270	0.228	0.168	0.007	0.094	-0.295	0.022	0.046	0.196	0.189	1.000	0.168	-0.091
UNR	-0.211	-0.233	0.091	-0.126	0.254	0.268	0.777	-0.209	0.184	0.035	0.256	-0.358	-0.084	0.060	0.255	0.411	0.168	1.000	-0.018
RAT	0.313	-0.107	-0.034	0.090	0.065	-0.161	0.149	-0.115	-0.090	0.058	-0.018	-0.035	-0.094	-0.063	-0.057	0.209	-0.091	-0.018	1.000

Note: The dependent variable is the market leverage ratio I (ML1), which captures financial liabilities only, defined as the ratio of financial liabilities to sum of financial liabilities and equity, using market values. The explanatory variables are marginal tax rate (MTR), debt maturity structure (DMS) defined as ratio of short-term liabilities to total liabilities, non-debt tax shields (NDTS), tangible assets-to-total assets (TANG), growth opportunities(GROW), size of the firm (SIZE), volatility of earnings before interest and taxes (VOL), firm profitability (PROF), liquidity measured by quick or acid-test ratio (QUICK), assets' riskiness measured by research and development and other intangible assets (RD), industry uniqueness (UNQ), financing deficit (DEF), market timing (MKTTIM), dividend payout ratio (DIV), age of the firm (AGE), and rating dummy as proxy for debt market access (RAT) as defined in Table 4. All variables capture firm-specific attributes. To resolve the issue of outliers, most of the variables with outlier presence were winsorized at the 5th and 95th percentiles corresponding to lower and upper values respectively.
Source: Author's analysis

Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

www.aercafrica.org

Learn More

www.facebook.com/aercafrica

www.instagram.com/aercafrica_official/

twitter.com/aercafrica

www.linkedin.com/school/aercafrica/

Contact Us
African Economic Research Consortium
Consortium pour la Recherche Economique en Afrique
Middle East Bank Towers,
3rd Floor, Jakaya Kikwete Road
Nairobi 00200, Kenya
Tel: +254 (0) 20 273 4150
communications@aercafrica.org