International Journal of Management, Economics and Social Sciences
2023, Vol. 12(1), pp. 1 – 28.
ISSN 2304 – 1366
http://www.ijmess.com

DOI:10.32327/IJMESS.12.1.2023.1

On the Stability of Capital Structure of Nigerian Quoted Firms

[*]Oluseun A. Paseda[1]
Olusegun Felix Ayadi[2]

[1]Dept. of Banking and Finance, University of Ibadan, Ibadan. Nigeria
[2] Jesse H. Jones School of Business, Texas Southern University, Houston, United States

One of the central debates in the empirical capital structure literature is the issue of capital structure stability. The purpose of this study is to examine the debate in the Nigerian context where it is largely an underexplored issue. This study employed the traditional leverage adjustment framework to examine the stability or adjustment of capital structure of a panel of Nigerian quoted firms in the presence of financing frictions. The population of this study comprised a panel of Nigerian quoted firms for the period 1999-2019 out of which 50 non-financial firms that met the data criteria were utilized as sample. Utilizing panel data generalized methods of moments (GMM) estimation techniques, the results revealed that capital structure variation overwhelms stability. The leverage measures exhibited strong sensitivities to firm-level variables, confirming trade-off, pecking order and market timing predictions. The target leverage was pro-cyclical in the sense of its sensitivity to macroeconomic variables. The study implications can be generalized to markets with similar characteristics, most notably that institutional rigidities exacerbate adjustment costs and, by extension, the gravitation of firms' debt dynamics towards slow adjustment.

Keywords: Capital structure stability, financing frictions, target adjustment, trade-off, pecking order

JEL: G30, G32

Modigliani and Miller [MM] (1958, 1963) set the agenda for the modern studies of capital structure and of corporate finance, generally. The stability of capital structure is a thorny issue that has pervaded the empirical corporate finance literature. Some researchers have argued that the main conundrum with respect to capital structure stability is the need to dissect the cross-firm variation in capital structure (DeAngelo and Roll, 2015, 2016) such that developing countries where such issues are generally underexplored can enrich the empirical evidence and shed light on debt dynamics.

Prominent empirical results of speed of adjustment (SOA) are divided into three schools of thought viz. slow adjustment (Devos *et al.*, 2017; Fama and French, 2002, 2005; Hovakimian and Li, 2011; Welch, 2004), rapid adjustment (Cao and Cui, 2021; Ezeani *et al.*, 2022; Flannery and Rangan, 2006; Huang and Ritter, 2009) and no adjustment (Chang and Dasgupta, 2009; Nguyen *et al.*, 2020). Flannery and Rangan (2006)

Manuscript received July 19, 2022; revised November 20, 2022; accepted December 23, 2022.
*Corresponding author: seunpash@yahoo.com

conclude that time-varying target ratios do a better job than stationary targets in explaining leverage, while Lemmon, Roberts and Zender (2008) conclude in favour of stationary targets as presented by Himmelberg and Tsyplakov (2020).

The theoretical and empirical work on capital structure stability in Africa has lagged behind those of developed countries. Empirical work on capital structure in developing economies especially those in Africa include Soyode (1978), Akintola-Bello (2002, 2004), Abor and Biekpe (2005, 2007), Ezeoha (2008), Kasozi (2009), Ezeoha and Botha (2012), Ramjee and Gwatidzo (2012), Gwatidzo, Ntuli and Mlilo (2016), Khemiri and Noubbigh (2018) etc. With very few exceptions, most of these studies examined the determinants of capital structure from both micro (firm-level) variables and macro-economic variables without considering the debate on the stability of capital structure and thereby failed to estimate the SOA and leverage half-life. Ezeoha and Botha (2012), Jooma and Gwatidzo (2013) and Paseda (2016) are clear exceptions as these studies estimated SOA for listed firms in South Africa, Ghana, Kenya, and Nigeria.

The debate on capital structure stability or adjustment motivates this study in an environment where it is an underexplored issue. It has been argued that a disaggregated approach across sectors and countries may even yield more meaningful results and predictions of corporate capital structure. More specifically, this study attempts to fill this important gap in the literature by providing numerical estimate of the adjustment speed of capital structure of Nigerian non-financial quoted firms over the period 1999-2019 and thereby offer fresh perspective on a contentious and exciting corporate finance issue.

There are two related research questions this study investigates: Do Nigerian quoted firms exhibit instability of capital structure as they gravitate towards target? And, if so, what is the speed of adjustment of capital structure?

The rest of the paper is divided into four sections. Next section presents theoretical underpinning and reviews the literature. Section 3 describes the data and methodology. Empirical results and discussion follow in Section 4 while section 5 concludes the study.

LITERATURE REVIEW

Theory of Capital Structure

MM (1958, 1963) laid the foundation for the theory of corporate finance. MM's assumption is that the firm's expected cash flows can be defined so that when the firm chooses a specific mix of debt and equity to finance its assets or capital budgets, then all it does is to divide up the cash flows among the investors – that is, debt holders and equity holders. This is the familiar pie model of capital structure. Under this MM framework, investors and firms have equal access to the capital markets, a condition which permits investors to substitute corporate borrowing for personal borrowing ("homemade leverage"). As a result, the debt ratio of the firm has no impact on the firm's market value. This powerful result holds under both the classic arbitrage-based irrelevance proposition (Hirshleifer, 1966, Stiglitz, 1969) and the multiple-equilibria based explanation (Miller, 1977). In the decades following MM's authoritative result, scholars have devoted attention to relaxing the perfect market assumptions that underlie the irrelevance theorem with growing emphasis on taxes, transactions costs, bankruptcy costs, information asymmetry, agency conflicts, non-separability of financing and investment decisions (Elsas, Flannery and Garfinkel, 2014), clientele effects, and time-varying market opportunities (Chen, 2021; Jin, Zhao and Kumbhakar, 2020). Indeed, several ingredients have emerged to underlie many post-MM theories of capital structure. Empirically, the irrelevance result may be difficult to test because both debt and firm value are potentially endogenous and driven by other factors such as profitability, asset tangibility, growth opportunities, size, age and business risk such that a structural test through regressing value on debt may be difficult to establish (Paseda, 2006; Paseda and Obademi, 2020; Paseda and Adedeji, 2020; Paseda, 2021a; Paseda, 2021b). Nonetheless, the fairly reliable relations between leverage and a number of factors from prior empirical work, while not disproving the MM theorem, do appear to provide some guide on how businesses in the real-world are financed (Brealey, Myers and Allen, 2020; Demirguc-Kunt, Peria and Tressel, 2020; Frank and Goyal, 2008, 2009; Lemmon *et al.*, 2008).

The most famous post-MM theories that emerged about four decades ago and have dominated current empirical work are the trade-off and pecking order theories of capital structure. The two conditional theories

differ on their emphasis of, and interpretation of market frictions of taxes and bankruptcy costs (for trade-off) and information asymmetry (for pecking order).

The trade-off approach derives an optimal debt level based on the marginal principle namely: the level that balances the marginal benefits of borrowing (primarily tax-shield benefit, but may include agency benefit in aligning managerial goals to those of shareholders) with the marginal costs of debt (primarily deadweight financial distress or bankruptcy costs, but may include agency costs of debt such as asset substitution). The MM (1963) and Miller (1977) represent the cornerstone for the trade-off theory. When only corporate taxes are factored into the original MM (1958) result in the absence of risky debt and within a strictly linear firm objective function, the greatest tax shield advantage occurs at 100 percent debt financing. With the introduction of personal taxes on debt and equity income as in Miller (1977), the corporate tax shield advantage is offset either partially or completely by the personal tax disadvantage on debt. At least four elements of the trade-off theory has merited researchers' attention namely: target debt ratio proxies (Shyam-Sunder and Myers, 1999), complexity of the tax code (Brealey *et al*., 2020), deadweight nature of financial distress costs (Glover, 2016), and the accuracy of the target (transaction) adjustment costs (Akintola-Bello, 2002, Hennessy and Whited, 2005, 2007, Yasmin and Rashid, 2018).

In sum, it is common to delineate trade-off theories into at least two models *viz*: the *static trade-off model* which focuses on balancing a single-period trade-off of tax benefits of leverage against the deadweight bankruptcy cost, and the *target adjustment model* which seeks to explain firms' target behaviour and the gradual elimination of deviations from targets over time (*dynamic trade-off*). The static trade-off has no theoretical recognition for retained earnings and mean reversion of debt ratios whereas the latter model does. The pecking order model, due to Myers (1984) and Myers and Majluf (1984), predicts because of the problem of information asymmetry that are more severe for riskier securities, firms prefer to finance with retained earnings, external financing is primarily debt rather than new equity and debt is primarily short-term. This preferred ordering may also arise as a result of agency and tax considerations. Outside financing requires

managers to explain the details of the planned capital expenditures to potential financiers and therefore expose them to investor monitoring and competitors' scrutiny. Managers dislike this process and thus prefer internal financing to external financing. High information asymmetry could increase the cost of external financing and thereby impede on firms' adjustment speed toward preferred targets (Jin, Zhao and Kumbhakar 2020).

Adjustment and Asymmetric Information Models

Again, the target adjustment model is an offshoot of the trade-off theory that seeks to balance the benefits of debt financing - via tax-shield and agency benefits - against the costs of debt financing – bankruptcy and agency costs of debt. The pecking order, on the other hand, arises as a result of asymmetric information between corporate insiders and outside investors which makes some financing instruments more prone to adverse selection than others. Thus, the pecking order leads to a hierarchy of financing for modern firms in which retained earnings are most preferred and when prior earnings are exhausted, debt is first on the pecking order of external financing. Equity is issued as a last resort.

Shyam-Sunder and Myers (1999) and Fama and French (2012) propose empirical tests for the trade-off theory against the pecking order through the flow-of-funds identity such as the type stated hereunder:

$$DEF_t = DIV_t + INV_t + \Delta W_t - C_t = \Delta L_t + \Delta E_t \qquad (1)$$

Where DEF_t = financing deficit at fiscal year t, DIV_t = cash dividends, INV_t = capital expenditures, ΔW_t = increase in working capital at fiscal year t, C_t = internally generated cash flows (operating cash flows), $\Delta L_t + \Delta E_t$ = net debt and net equity issues, respectively.

Under a strict pecking order where equity is issued as a last resort, the empirical equation is as follows:

$$\Delta L_t = \alpha + b_{PO}\, DEF_t + \varepsilon_t \qquad (2)$$

In other words, debt financing tracks financing deficits so that b_{PO} is not statistically distinguishable from one while α is statistically indistinguishable from zero. ε_t is an independently identically normally distributed error-term.

In the static tradeoff theory, managers seek optimal capital structure. Random events would bump them

away from it, and they would then have to work gradually back. The simple form of the target adjustment hypothesis states that changes in the debt ratio are explained by deviations of the current (debt) ratio from the target. The regression specification is:

$$\Delta L_{it} = \alpha + b_{TA} (L_{it}^{*} - L_{it-1}) + \varepsilon_{it} \quad (3)$$

ΔL_{it} is the amount of debt issued – or retired, if there was free cash flow (i.e., a financial surplus which is same as negative financing deficit) in firm i.

L_{it}^{*} is the target debt level for firm i at time t. The variables can, of course, be transformed into ratios by scaling them to total assets of the firm which is the technique embraced in this paper. The target-adjustment coefficient, b_{TA}, is a sample wide constant. At the very core of target behavioral tests, the hypothesis to be tested is $b_{TA} > 0$, indicating adjustment towards the target, but also $b_{TA} < 1$, implying positive adjustment costs. The equality of b_{TA} to zero implies the absence of adjustment toward a target debt ratio while unity ($b_{TA}=1$) implies instantaneous adjustment such as would occur in the absence of adjustment costs. The smaller the coefficient of the target-adjustment, the faster is the speed of adjustment.

Capital Structure Adjustment Speeds from Prior Empirical Work

Much of the prior empirical work on capital structure stability utilize GMM framework in estimating the degree of stability or the speed of adjustment where instability occurs. Table 1 (see Appendix-I) summarizes the speed of adjustment (SOA) from prior work.

METHODOLOGY

The familiar ex post facto approach best describes the research design for this study. Data for the study are essentially secondary in nature and obtained from official sources. Nigerian Stock Exchange (NSE) publications as well as the annual financial reports of quoted companies constitute the sources of data for this study. Macroeconomic data are obtained from the Central Bank of Nigeria (CBN) Statistical Bulletins and World

Bank publications. The population of the study covers all Nigerian quoted firms for the study period 1999-2019. The firms are statutorily required to publish their audited annual financial statements. As on December 31 2019, there were 158 companies on the Nigerian Stock Exchange (NSE). The study sample, however, includes only those firms whose financial statements figures can be obtained as far back as 1999. The period 1999 was chosen to coincide with the new democratic system of governance in the country as well as the year for the release of the Investment and Securities Act (ISA) for the operations of capital market. 2019 was chosen as end-date as an attempt to update the data as much as possible. Thus, the time frame for the study covers a 21-year period from 1999 to 2019.

In determining the sample for the study, some further adjustments are necessary. First, companies with missing data for at least two years within the study period were removed. If a company's annual report is missing for only one year, one could obtain data for the "missing year" by examining comparative statements for the available year. Second, all financial institutions are excluded from the study because of their unique leverage nature. The capital structure of banks and many other financial institutions are determined by government regulation and many exogenous factors which are outside the scope of this study. This exclusion of financial institutions is in line with empirical studies on capital structure. Nonetheless, a separate capital structure study could be done focusing exclusively on financial institutions. Third, there is an attempt to capture at least all non-financial sectors in the final sample selection. Eventually, 50 companies made the final sample selection.

Model Specification, Estimation Techniques and Procedure

A simple test of the target adjustment hypothesis is adopted below

$$\Delta L_{it} = \alpha + b_{TA}\,(L_{it}^{*} - L_{it-1}) + \varepsilon_{it} \qquad (4)$$

From the LHS, ΔL_{it} is the change in debt ratio for firm i at time t (i.e., L_{it}-L_{it-1}), L_{it} is the observed or actual leverage, L_{it}^{*} is the target debt ratio obtained through regression of debt ratio on some predetermined covariates such as firm-level attributes and macroeconomic variables stated in equation (8) below. L_{it-1} is the

lagged debt ratio which also appears on the LHS as the value subtracted from a contemporaneous debt ratio.

$$L_{it}^{*} = \alpha_0 + \beta X_{it} + \mu_i + \mu_t + \varepsilon_{it} \qquad (5)$$

Where L_{it}^{*} is the target leverage ratio. X_{it} is the vector of predictor variables or covariates. α_0 is the intercept which represents the debt level where the values of all the predictor variables are zero. Equation (5) adds the unobserved firm-specific effect (μ_i) and the unobserved time-specific firm-invariant effect (μ_t). ε_{it} is the error term. The error term is 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.

From equation (4), both intercept and error terms are expected to have a mean value of zero. Thus, (4) can be re-written as:

$$L_{it} - L_{it-1} = b_{TA} (L_{it}^{*} - L_{it-1}) \qquad (6)$$

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

Collecting like terms reduces (7) into equation (8) below

$$L_{it} = (1 - b_{TA}) L_{it-1} + b_{TA} L_{it}^{*} \qquad (8)$$

Substituting (5) into (8) yields

$$L_{it} = (1 - b_{TA}) L_{it-1} + b_{TA} \alpha_0 + b_{TA} \beta X_{it} + \mu_i + \mu_t + \varepsilon_{it} \qquad (9)$$

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

$$L_{it} = \delta L_{it-1} + \gamma_0 + \gamma_j X_{it} + \mu_i + \mu_t + \varepsilon_{it} \qquad (10)$$

$(1 - \delta)$ is the SOA and thus this study seeks to estimate equation (10) utilizing the dynamic GMM technique of Arellano and Bond (1991) and Blundell and Bond (1998) for this partial adjustment model. Specifically, the system GMM estimator is favored over the differenced GMM estimator. This is in line with the well-documented merits of the system GMM in terms of its accommodation of potential endogeneity or simultaneity problems in the independent variables. The system GMM estimator is more useful in overcoming the finite sample biases

associated with a differenced estimator. The GMM estimator also accounts for autocorrelation in the presence of lagged dependent variable. The System GMM estimator is more efficient than the differenced estimator as it minimizes the loss of valuable information arising from transformations by estimating the differenced and level equations simultaneously as a system. This study employs standard firm-level and macroeconomic variables defined in Table 2 (see Appendix-II).

RESULTS

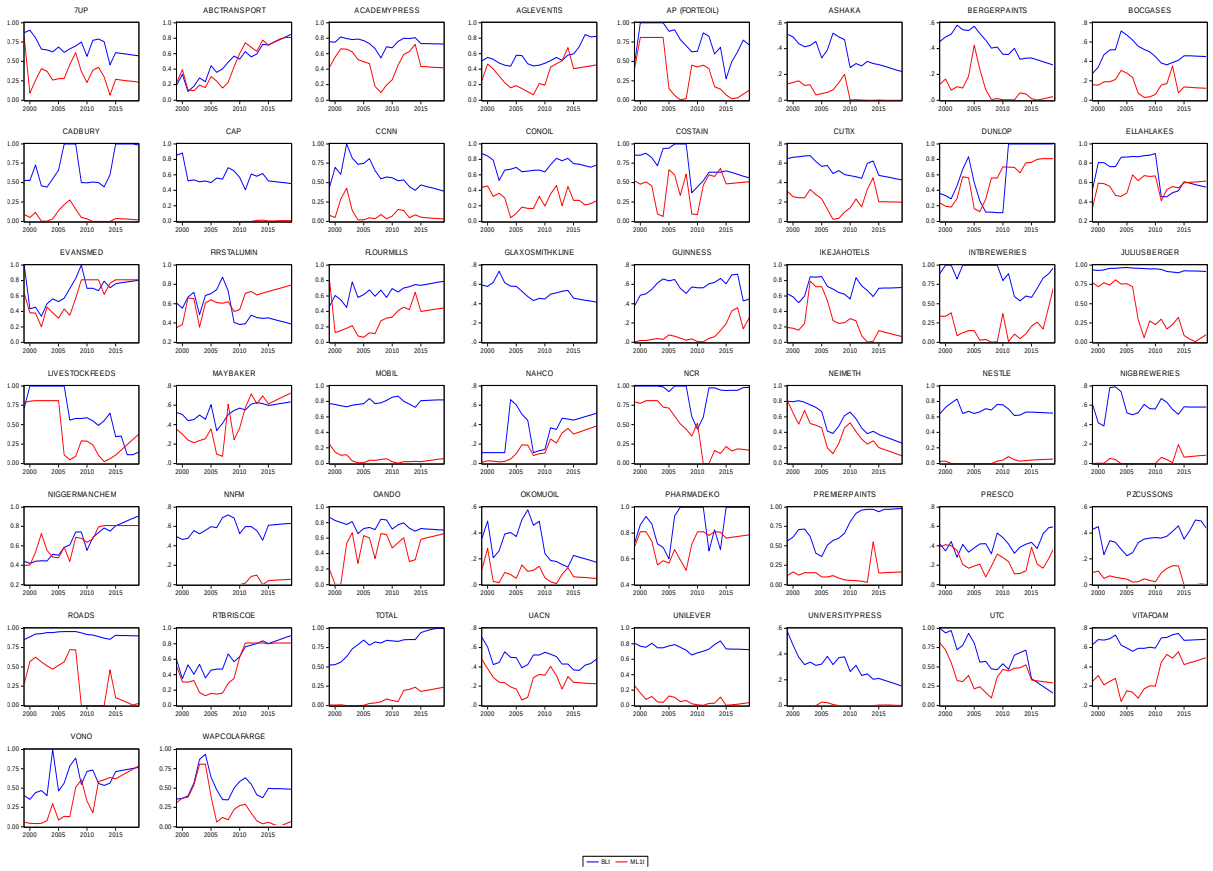
Our empirical approach consists of three steps: graphical presentation of variables, summary statistics and correlation matrix; panel data analysis of elasticities including estimation of SOA; and a simple test of the pecking order theory.

Summary Statistics, Correlation Matrix and Graphical Presentation of Variables

This section begins with graphical display of leverage measures of the 50 Nigerian non-financial firms. To raise the issue of capital structure stability or otherwise, it is necessary to observe the movement of the leverage ratios – the book leverage and market leverage ratios of the sample firms between the period 1999 and 2019. The tendency of companies with high (low) leverage ratios to maintain high (low) leverage ratios for two decades or longer is viewed as consistent with capital structure stability. This view opines that firms keep their debt ratios close to target ratios that do not change much over long periods (DeAngelo and Roll 2016). The instability of capital structures can be seen in the sample companies based on fluctuating book leverage and market leverage ratios in Figure 1.

From the summary statistics in Table 3 (see Appendix-III), the two leverage measures, book leverage (BLt) and market leverage II (ML2t) do not deviate much from symmetry on the basis of proximate mean and median values as well as the closeness of the skewness to zero. In other words, the leverage distribution approximates normality. The following variables have values greater than one: TOBINQ, SIZE, QUICK, MKTTIM, AGE, RSI and UNR. Contrary to some studies such as Faulkender and Petersen (2006) and Chipeta and Deressa (2016) that reduce such firm-specific variables (greater than one) to one because of concerns about mean outliers, this study adopts the technique of winsorizing the extreme values at the 5th and 95th percentile respectively.

Further, on the basis of the relationship between the mean values of market leverage I and market leverage II, the proportion of financial liabilities to total liabilities of the average firm is approximately 60 percent. In



Source: Authors' Presentation

Notes: Book leverage is the ratio of total book liabilities to total assets. Market leverage I is the ratio of the market value of debt to the total market values of debt and equity. The blue lines symbolize book leverage while red lines represent market leverage. Leverage data are from the companies' annual financial statements. Market values are from the NSE.

Figure 1. Leverage Ratios of the 50 Sample Firms: 1999-2019

From the summary statistics in Table 3 (see Appendix-III), the two leverage measures, book leverage (BLt) and market leverage II (ML2t) do not deviate much from symmetry on the basis of proximate mean and median values as well as the closeness of the skewness to zero. In other words, the leverage distribution approximates normality. The following variables have values greater than one: TOBINQ, SIZE, QUICK, MKTTIM, AGE, RSI and UNR. Contrary to some studies such as Faulkender and Petersen (2006) and Chipeta and Deressa (2016)

that reduce such firm-specific variables (greater than one) to one because of concerns about mean outliers, this study adopts the technique of winsorizing the extreme values at the 5th and 95th percentile, respectively. Further, on the basis of the relationship between the mean values of market leverage I and market leverage II, the proportion of financial liabilities to total liabilities of the average firm is approximately 60 percent. In addition, despite the fact that the book leverage (BLt) and market leverage II (ML2t) both have the same numerator, the divergence in mean and median values must be due to higher equity market prices relative to book equity values. Some of the explanatory variables such as tangibility, size, growth in sales, profitability, dividend payout ratio, unionization ratio, all-share index and growth in gross domestic product (GDPG) also approximate normal distributions.

From the correlation matrix Table 4 (see Appendix-IV), the leverage measures are highly correlated which is not unexpected. All the explanatory variables are fairly related but not highly correlated because the highest correlation coefficient in the matrix is 0.7 between size and unionization ratio. Thus, based on the rule of thumb around multicollinearity problem, there is no cause for alarm on this econometric issue.

Panel Data Analysis of Elasticities

The estimated equation is:

$$L_{it} = \delta L_{it-1} + \gamma_0 + \gamma_j \mathbf{X}_{it} + \mu_i + \mu_t + \varepsilon_{it} \qquad (13)$$

Where the SOA is (1- δ), the estimates of the speed of adjustment of book leverage, market leverage I and market leverage II are 22.58 percent, 20.55 percent and 18.8 percent, respectively, corresponding to a leverage half-life of 2.7, 3.0 and 3.3 years. These estimates are both economically and statistically significant to alternative model estimation of the leverage equation (13) (Table 5, see Appendix-V).

The system GMM estimates show some economically significant relationships between leverage and the covariates. The system GMM estimation helps to overcome potential endogeneity concerns as well as simultaneity problems with covariates. Specifically, leverage increases with marginal tax rate, non-debt tax shields, TOBINQ, firm size, asset riskiness or intangibility (RD), financing deficit, dividend payout ratio,

unionization ratio, rating dummy (proxy for debt market access), inflation and economic growth rate (GDPG). The positive impact of inflation and economic growth on leverage implies that leverage is procyclical. In contrast, the system GMM reveals negative influences on leverage from asset collateral or tangibility, firm growth (proxied by growth in sales), profitability, liquidity, product or industry uniqueness, market timing, dividend payment decision, firm age, relationship-specific investments, government borrowing, changes in all-share index (as indicator of equity market conditions), and term spread.

In terms of statistical significance of the system GMM framework, there were eight significant variables explaining changes in debt ratios namely: asset tangibility, firm growth, profitability, dividend payout ratio, dividend payment decision or dividend payment dummy, firm age, changes in all-share index and inflation.

From the instrumental variables GMM estimation, book leverage increases with the marginal tax rate, non-debt tax shield, TOBINQ as a proxy for growth potential, financing deficit, relationship-specific investments, employee bargaining proxied by unionization ratio and debt market access (rating dummy, RAT). Book leverage however, declines with asset tangibility, firm profitability, liquidity, market timing, dividend payout decision, all-share index, GDP growth and term spread. These estimates are also both economically and statistically significant. In other words, firms in higher marginal tax bracket and those with higher non-debt tax shields borrow more. The behaviour of high-growth firms on the basis of TOBINQ is indicative of higher borrowing contrary to the expected debt conservative prediction for such firms in a bid to avoid under-investment problem.

Market leverage increases with non-debt tax shields, firm size, research and development and other intangible assets, relationship-specific investments, debt market access (rating) and inflation. The asset tangibility, TOBINQ, growth, liquidity as measured by quick ratio, dividend payout decision, all-share index and term spread exert negative influences on market leverage. To see Pecking Order Test results, please see Table 6 (see Appendix-VI) below.

DISCUSSION

This study investigates the issue of capital structure adjustment and provides evidence in support of capital structure instability in Nigerian non-financial quoted firms. The factors driving the instability are a mixture of firm-level and macroeconomic variables.

Despite the evidence that either unsystematic (or firm-specific) and systematic (or macroeconomic) risks affect firms' capital structure, corporate finance researchers have not fully examined the effect of the latter on adjustment of capital structure. In the presence of adjustment costs, firms move towards their desired target leverage ratios at a gradual pace in order to minimize transactions costs. The dynamic trade-off theory implies that firms facing differential transaction costs of adjustment may follow different paths toward their desired debt levels. The model for target debt ratio was estimated using the System GMM dynamic panel data estimator on the balanced panel of 50 quoted Nigerian non-financial firms covering the period of 21 years from 1999 to 2019. Under the target point framework in Nigerian quoted firms, the speed of adjustment of book leverage, market leverage I and market leverage II are 22.58 percent, 20.55 percent and 18.8 percent, respectively, corresponding to a leverage half-life of 2.7, 3.0 and 3.3 years.

The speed of adjustment (SOA) of capital structure has been a contentious issue in empirical corporate finance and many scholars have challenged estimates from prior studies. This study uses the traditional leverage adjustment framework to describe and explain the target adjustment behavior of Nigerian quoted firms in the presence of financing frictions. Fifty Nigerian quoted firms for the period 1999-2019 that met the criteria for selection were used. Under the target point framework, the SOA of book leverage (market leverage) is 22.58 percent (20.55%) corresponding to leverage half-life of 2.7 years (3 years). Consistent with the prediction of the target adjustment hypothesis, the evidence on capital structure variation overwhelms capital structure stability. Macroeconomic variables such as term spread, economic growth (measured by growth in gross domestic product), inflation, government borrowing and equity market also exert significant influences.

CONCLUSION

The dynamic trade-off theory of leverage signifies that firms facing differential adjustment costs to refinancing may follow different paths to their capital structure. The differential adjustment costs affect the pace of capital structure rebalancing. In other words, the speed of capital structure adjustment is sensitive to refinancing or rebalancing costs. The speed of adjustment (SOA) of capital structure has been a contentious issue in empirical corporate finance and many scholars have challenged estimates from prior studies. This study uses the traditional leverage adjustment framework to describe and explain the target adjustment behavior of Nigerian quoted firms in the presence of financing frictions. Fifty Nigerian quoted firms for the period 1999-2019 that met the criteria for selection were used. Under the target point framework, the SOA of book leverage (market leverage) is 22.58 percent (20.55%) corresponding to leverage half-life of 2.7 years (3 years). Consistent with the prediction of the target adjustment hypothesis, the evidence on capital structure variation overwhelms capital structure stability. Macroeconomic variables such as term spread, economic growth (measured by growth in gross domestic product), inflation, government borrowing and equity market also exert significant influences. In addition, the covariates considered in this study are wider than those utilized in many prior developed country-studies. The implications can be generalized to markets with similar macroeconomic and institutional settings and deepen the understanding of capital structure dynamics. The main incremental contributions of this paper are twin.

First, the paper demonstrates the existence of capital structure instability in support of target adjustment model. By utilizing recent data, the empirical tests conducted in this paper provide interesting new results as well as fresh perspectives on capital structure adjustment behavior. Capital structure inertia is an exception not the rule for Nigerian quoted non-financial firms. This paper adds to the empirical corporate finance literature on debt dynamics.

Second, on the basis of actual adjustments, the study provides numerical estimates of the SOA and leverage half-life of the typical firm and thus provides bases for comparison with estimates from previous studies in Nigeria to ascertain potential persistent behavior of SOA and leverage half-life or otherwise as well

as comparisons of these estimates with those obtained from similar emerging markets with proximate institutional characteristics especially in the areas of bond and equity market development, corporate ownership structure and the legal system. For instance, the estimates of the SOA (and book leverage half-life) from this study slightly agree with those obtained for Sub-Saharan African countries of Botswana, Ghana, Kenya, Malawi, Mauritius and South Africa – an observation consistent with theoretical expectations that firms in economies at similar levels of economic development and institutional quality may be faced with similar financing frictions and adjustment costs. The estimates are also similar to those obtained by Buvanendra *et al*. (2017) for Sri Lanka and India.

No paper has explored the possibility of firms voluntarily allowing their debt ratios to float within a target zone framework and thus there were no attempts at calibrating upper and lower thresholds for debt ratios and, therefore, constitute a motivation for future work.

REFERENCES

Abor, J. & Biekpe, N. (2005). What determines the capital structure of listed firms in Ghana? *African Finance Journal*, 7, 37-48.

Abor, J. & Biekpe, N. (2007). How do we explain the capital structures of SMEs in Sub-Saharan Africa? Evidence from Ghana. *Journal of Economic Studies*, 36(1): 83-97.

Akintola-Bello, O. (2002). An epistemological assessment of the $L_t^* = \alpha_t + \beta L_{t-1}$ model of capital structure adjustment, *Discussion Paper Series*, Department of Banking and Finance, Olabisi Onabanjo University, Nigeria.

Akintola–Bello, O. (2004). *The Nigerian stock market: Behaviour and performance.* Arbitrage Studies in the Capital Market, Lagos: Arbitrage Consulting.

Antoniou, A., Guney, Y. & Paudyal, K. (2008). The determinants of capital structure: Capital market-oriented versus bank-oriented institutions. *Journal of Financial and Quantitative Analysis*, 43(1): 59-92.

Arellano, M. & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58(2): 277-297.

Blundell, R. & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1): 115-143.

Brealey, R., Myers, S. & Allen, F. (2020). *Principles of corporate finance*, 13th Edition. New York: McGrawHill Inc.

Buvanendra, S., Sridharan, P. & Thiyagarajan, S. (2017). Firm characteristics, corporate governance and capital structure adjustments: A comparative study of listed firms in Sri Lanka and India. *IIMB Management Review*, 29, 245-258.

Cao, J. & Cui, Y. (2021). Trade credit and capital structure adjustment speed: Evidence from Chinese listed firms, *Review of Pacific Basin Financial Markets and Policies*, 24(1): 1-21.

Chang, X. & Dasgupta, S. (2009). Target behaviour and financing: How conclusive is the evidence? *Journal of Finance*, 64:1767 -1796.

Chen, J. (2021). On the theoretical foundation of corporate finance. *Structural Change and Economic Dynamics*, 59: 256-262.

Chipeta, C. & Deressa, C. (2016). Firm and country specific determinants of capital structure in Sub-Saharan Africa. *International Journal of Emerging Markets*, 11(4): 649-673.

Danso, A., Fosu, S., Owusu-Agyei, S., Ntim, C. G., & Adegbite, E. (2021). Capital structure revisited. Do crisis and competition matter in

a Keiretsu corporate structure? *International Journal of Finance and Economics*, 26(4): 5073-5092.

Daskalakis, N., Balios, D. & Dalla, V. (2017). The behaviour of SMEs' capital structure determinants in Different Macroeconomic States. *Journal of Corporate Finance*, 46, 248-260.

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

DeAngelo, H. & Roll, R. (2016). Capital structure instability. *Journal of Applied Corporate Finance*, 28(4): 38-52.

DeBondt, W. & Thaler, R. (1985). Does the stock market overreact? *Journal of Finance*, 40, 793-805.

Demirguc-Kunt, A., Peria, M. S. M. & Tressel, T. (2020). The global financial crisis and the capital structure of firms: Was the impact more severe among SMEs and non-listed firms? *Journal of Corporate Finance*, 60(1): 1-32.

Devos, E., Rahman, S. & Tsang, D. (2017). Debt covenants and the speed of capital structure adjustment. *Journal of Corporate Finance*, 45(1): 1-18.

Elsas, R., Flannery, M. J. & Garfinkel, J. A. (2014). Financing major investments: Information about capital structure decisions. *Review of Finance*, 18(4): 1341-1386.

Ezeani, E., Salem, R., Kwabi, F., Boutaine, K., & Komal, B. (2022). Board monitoring and capital structure dynamics: Evidence from bank-based economies. *Review of Quantitative Finance and Accounting*, 58, 473-498.

Ezeoha, A. (2008). Firm size and corporate financial leverage choice in a developing economy: Evidence from Nigeria. *Journal of Risk Finance*, 9, 351-364.

Ezeoha, A. & 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.

Fama, E. F. & French, K. R. (2002). Testing tradeoff and pecking order predictions about dividends and debt. *Review of Financial Studies*, 15, 1-33.

Fama, E. F. & French, K. R. (2005). Financing decisions: Who issues stock? *Journal of Financial Economics*, 76, 549-582.

Fama, E.F. & French, K. R. (2012). Capital structure choices. *Critical Finance Review*. 1, 59-101.

Flannery, M. J. & Rangan, K. P. (2006). Partial adjustment toward target capital structures. *Journal of Financial Economics*. 79, 469-506.

Frank, M. Z. & Goyal, V. K. (2008). Trade-off and pecking order theories of debt, in B. E Eckbo (ed.) *Handbook of Corporate Finance: Empirical Corporate Finance.* Amsterdam: Elsevier.

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

Glover, B. (2016). The expected cost of default. *Journal of Financial Economics*, 119, 284-299.

Graham, J.R. & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, 60, 187-243.

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

Hennessy, C. A. & Whited, T. M. (2005). Debt dynamics. *Journal of Finance*, 60(3): 1129-1165.

Hennessy, C. A. & Whited, T. M. (2007). How costly is external financing? Evidence from a structural estimation. *Journal of Finance*, 62, 1705-1743.

Himmelberg, C. P. & Tsyplakov, S. (2020). Optimal terms of contingent capital, incentive effects and capital structure dynamics, *Journal of Corporate Finance*, 64, 101635

Hirshleifer, J. (1966). Investment decision under uncertainty: Applications of the state-preference approach. *Quarterly Journal of Economics*, 80(2): 252–277.

Hovakimian, A. & Li, G. (2011). In search of conclusive evidence: How to test for adjustment to target capital structure. *Journal of Corporate Finance*, 17(1): 33-44.

Huang, R., & Ritter, J. (2009). Testing theories of capital structure and estimating the speed of adjustment. *Journal of Financial and Quantitative Analysis*, 44, 237 -271.

Jin, M., Zhao, S. & Kumbhakar, S.C. (2020). Information asymmetry and leverage adjustments: A semi-parametric varying-coefficient approach. *Journal of the Royal Statistical Society*, 183(2): 581-605.

Jooma, M. Y. H. & Gwatidzo, T. (2013). Partial adjustment toward target capital structure: Evidence from selected African countries. *Corporate Ownership and Control*, 10(3): 474-489.

Kasozi, S. J. (2009). The capital structure practices of listed firms in South Africa. Unpublished M.Sc. Dissertation, University of South Africa.

Khemiri, W., & Noubbigh, H. (2018). Determinants of capital structure: Evidence from Sub-Saharan African firms. *Quarterly Review of Economics and Finance*, 70, 150-159.

Kim, H. J., Sohn, P. & Seo, J-Y. (2015). The capital structure adjustment through debt financing based on various macroeconomic conditions in Korean market. *Investigacion Economica*, 74(294): 155-172.

Korteweg, A. & Strebulaev, I., (2015). An empirical target zone model of dynamic capital structure. Working Paper, Stanford University.

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

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

Miller, M.H. (1977). Debt and Taxes. *Journal of Finance*, 32, 261-276.

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

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

Mokuoane, M. (2016). Capital structure under different macroeconomic conditions: Evidence from South Africa. Unpublished M.Com in Finance Dissertation, University of Witwatersrand, South Africa. May 2016.

Myers, S. (1984), The capital structure puzzle. *Journal of Finance*, 39: 575 – 592.

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

Nguyen, N. H., Phan, H.V. & Lee, E. (2020). Shareholder litigation rights and capital structure decisions, *Journal of Corporate Finance*, 62: 101601.

Oino, I. & Ukaegbu, B. (2015). The impact of profitability on capital structure and speed of adjustment: An empirical examination of selected firms in Nigerian Stock Exchange. *Research in International Business and Finance*, 35: 111-121.

Oztekin, O. & Flannery, M. J. (2012). Institutional determinants of capital structure adjustment speeds. *Journal of Financial Economics*, 103: 88-112.

Paseda, O. (2006). *Investment performance of common stocks in Nigeria*. Germany: GRIN Publishers.

Paseda, O. (2016). The determinants of capital structure of Nigerian quoted firms. Ph.D. Thesis, Department of Finance, University of Lagos, Nigeria.

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

Paseda, O. & Obademi, O. (2020). Macroeconomic variables and their effects on the capital structure of quoted Nigerian firms, *Finance and Banking Review*, 14(1): 31-51

Paseda, O. (2021a). An empirical analysis of low-leverage behaviour: evidence from Nigerian quoted firms. *African Economic Research Consortium (AERC) Working Paper Series*.

Paseda, O. (2021b). The impact of unemployment on corporate debt policy of Nigerian quoted firms, Forthcoming *UNILAG Journal of Humanities*.

Ramjee, A. & Gwatidzo, T. (2012). Dynamics in capital structure determinants in South Africa. *Meditari Accountancy Research*, 20(1): 52-67.

Rani, N., Yadav, S. S. & Tripathy, N. (2019). Capital structure dynamics of Indian corporates. *Journal of Advances in Management Research*, 17(2): 212-225.

Shyam-Sunder, L. & Myers, S. C. (1999). Testing static tradeoff against pecking order models of capital structure. *Journal of Financial Economics*, 51: 219-244.

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

Stiglitz, J. E. (1969). A re-examination of the Modigliani-Miller theorem. *American Economic Review*, 59: 784–793.

Welch, I. (2004). Capital structure and stock returns. *Journal of Political Economy*, 112:106-131.

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

Yasmin, A. & Rashid, A. (2018). Financial conservatism and speed of adjustment towards target capital structure: Empirical evidence from Pakistan. *Pakistan Journal of Commerce and Social Sciences*, 12(2): 477-500.

Appendix-I

Study	Sample Period	Country of Study	SOAs	Half-Life
Fama and French (2002)	1965-1999	USA	10.0%, 18.0%	6.6, 3.5 years
Lemmon, Roberts and Zender (2008)	1963-2003	USA	25.5%	2.4 years
Antoniou, Guney and Paudyal (2008)	1987-2000	UK, USA	32.0%, 32.2%	1.8, 1.8 years
Kasozi (2009)	1995-2005	South Africa	46.19%	1.12 years
Ezeoha and Botha (2012)	1999-2009	South Africa	43% (Market leverage) 56% (book leverage)	1.2, 0.8 years
Oztekin and Flannery (2012)	1991-2006	37 countries including the G20 countries. South Africa is the only African country in the sample.	4.06-40.61% (book leverage) Medium BL-21.11% 10.87-52.86% (market leverage) Medium ML-26.29%	1.1 – 16.7 years 2.9 years (median) 0.9 – 6.0 years 2.3 years (median)
Jooma and Gwatidzo (2013)	2001 – 2011	Ghana, Kenya, Nigeria, and South Africa	29.4%, 24.1%, 46.3%, 42.8% respectively (total leverage estimation)	2.0, 2.5, 1.1, 1.2 years
	2001-2011	Ghana, Kenya, Nigeria, and South Africa	17.9%, 27.5%, 60.2%, 53% respectively (long-term leverage estimation)	3.5, 2.2, 0.8, 0.9 years
Oino and Ukaegbu (2015)	1995-2013	Nigeria	47%	1.1 years
Kim, Sohn and Seo (2015)	1990-2010	Korea	34.8%, 50.7% (boom) 38.7%, 53.2% (recession)	1.0, 1.6 years 0.9, 1.4 years
Mokuoane (2016)	2000-2014	South Africa	60.8%, 32.1%	0.74, 1.79 years
Paseda (2016)	1999-2014	Nigeria	43.2%	1.2 years
Chipeta and Deressa (2016)	2004-2013	Botswana, Ghana, Kenya, Malawi, Mauritius, Namibia, Nigeria, South Africa, Tanzania, Uganda, Zambia and Zimbabwe	On the Basis of the Strength of the Legal System 12.3% (bottom) 14.6% (lower) 16.2% (top) 16.5% (upper)	5.3, 4.4, 3.9, 3.8 years, respectively.
Buvanendra, Sridharan and Thiyagarajan (2017)	2004-2013	Sri Lanka, India	45.42%, 26.05%	1.1, 2.3 years
Daskalakis, Balios, and Dalla (2017)	2004-2014	Greece	7.8%, 7.1% (total leverage) 9.9%, 11.3% (short term leverage) 15.5%, 7.2% (Long term leverage)	8.5, 9.4 years 6.6, 5.7 years 4.1, 9.3 years
Rani, Yadav and Tripathy (2019)	2000- 2018	India	10.38%, 15.49%	6.3, 4.1 years

Source: Authors' Review of the Empirical Literature

Table 1. Estimates of the Speed of Adjustment of Capital Structure

Appendix-II

S/N	Explanatory Variable	Definition	Indication / Proxy	Expected Sign	Expected Magnitude
1	MTR	Marginal tax rate, Tax expense divided by Earnings before tax	Effect of debt tax shield	+	$0 < \beta_{MTR} < 1$
2	NDTS	Non-debt tax shield, (Depreciation+ Investment tax credit)/ Total assets less current liabilities	Substitute (or complement) for the debt tax Shield	-	$-1 < \beta_{NDTS} < 0$
3	TANG	Tangible assets defined as Property, Plant and Equipment (PPE) divided by total assets	Collateral, a measure of debt capacity.	+/-	$-1 < \beta_{TANG} < 1$
4	GROWSL	Growth opportunities, measured by the change in annual revenue of firms.	Growth	-	$-1 < \beta_{GROW} < 0$
5	TOBINQ	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	-	$-1 < \beta_{TOBINQ} < 0$
6	SIZE	Size defined as the natural logarithm of Sales (LNS)	Size effect	+	$0 < \beta_{SIZE} < \infty$
7	VOL	Volatility of earnings defined as the standard deviation of operating earnings (EBIT) scaled by operating earnings	Business Risk	-	$-1 < \beta_{VOL} < 0$
8	PROF	Defined by ROCE or ROA = Earnings before Interest and Taxes/ Total Assets less current liabilities	Profitability	+/-	$-1 < \beta_{PROF} \leq 1$
9	QUICK	A stricter measure of liquidity relative to current ratio. Quick ratio is defined as Current assets less inventory divided by current liabilities	Liquidity	+/-	$-1 < \beta_{QUICK} \leq 1$
10	RD	Research and Development plus other intangible assets / (Total Assets – Current Liabilities)	Asset Uniqueness or intangibility	-	$-1 < \beta_{RD} < 0$
11	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 (Danso, *et al.*, 2021)	-	$-1 < \beta_{UNQ} < 0$
12	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).	+	$0 < \beta_{DEF} \leq 1$ OR $\beta_{DEF} = \beta_{PO} = 1$
13	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.	-	$-1 < \beta_{MKTTIM} < 0$
14	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	-	$-1 < \beta_{DIV} < 0$
15	DIVDUMMY	Dividend dummy variable that assumes a value of one if dividend is paid in year *t* or zero otherwise.	Asymmetric information	-	$-1 < \beta_{DIVDUM} < 0$

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 be correlated with SIZE.	+	$0 < \beta_{AGE} < 1$
18	$(D_{it}^{*} - D_{it-1})$	Target adjustment in debt ratios measured as target debt ratio minus lagged debt ratio. Target debt ratio is proxied by leverage regression.	Target behavior in financing. $\beta_{TA} > 0$ – target behavior holds $\beta_{TA} < 1$ - +ve adjustment costs. Chang and Dasgupta (2009), Korteweg & Strebulaev (2015).	+	$0 < \beta_{TA} < 1$
19	RSI	Relationship-specific investments (RSI) measured by the ratio of "Bought-in goods and services (BIGS)" to Depreciation (Danso, *et al.*, 2021).	Product-input market interaction. BIGS links the input and product markets of a firm and thus proxies for RSI with suppliers and customers.	-	$-1 < \beta_{RSI} < 0$
20	UNR	Unionization ratio as measure of bargaining power of employees. Measured as the natural log of value-added per employee	Bargaining power of employees	-	$0 < \beta_{UNR} < 1$
21	INF	Inflation has a wealth redistribution effect. Borrowers gain while lenders lose during inflation. ΔCPI=Change in consumer price index.	Impact of macroeconomic fluctuations on financing	+	$0 < \beta_{INF} < 1$
22	GDPG	Change in GDP. Economic growth or decline when growth is negative.	Impact of macroeconomic fluctuations on financing	-/+	$-1 < \beta_{GDPG} < 1$
23	TS	Term spread or term premium. The spread between yield on long-term government bond and treasury bill.	Debt market conditions. Higher term spread indicates investors' unwillingness to lend long.	-	$-1 < \beta_{TS} < 0$
24	GB	Government borrowing measured by government borrowing to GDP ratio	Impact of government borrowing on corporate borrowing.	-	$-1 < \beta_{GB} < 0$
25	ASI	All-share index. Change in all-share index is used to gauge equity market movements. Upward movement implies improvement and vice versa	Equity market conditions on debt financing. Improvement in equity market conditions holding debt market constant will reduce firm borrowing.	-	$-1 < \beta_{ASI} < 0$

Source: Authors' Presentation

Table 2. Determinants of Capital Structure Adjustments and their Apriori Signs and Sizes

Appendix-III

	BLT	**ML1T**	**ML2T**	**MTR**	**NDTS**	**TANG**	**TOBINQ**	**SIZE**	**GROWSL**	**VOL**	**PROF**	**QUICK**	**RD**	**UNQ**
Mean	0.6234	0.2753	0.4728	0.2311	0.1166	0.6123	3.2419	15.8627	0.1574	0.1592	0.2275	0.7122	0.0296	0.6200
Median	0.6135	0.1947	0.4308	0.2997	0.0725	0.6374	1.7289	15.8283	0.1375	0.0928	0.1956	0.6197	0.0000	1.0000
Maximum	0.9986	0.8084	0.9893	0.5798	0.7773	0.9895	21.1471	22.4924	0.9499	0.8954	0.9118	2.9950	0.7206	1.0000
Minimum	0.1111	0.0000	0.0996	-1.2458	0.0070	0.0861	-3.1239	9.8459	-0.6074	-0.0793	-0.3060	0.0291	0.0000	0.0000
Std. Dev.	0.2142	0.2588	0.2592	0.2750	0.1378	0.2858	4.3556	2.1462	0.2677	0.1953	0.2803	0.4517	0.1022	0.4856
Skewness	-0.0608	0.7305	0.3405	-2.7818	2.8584	-0.2686	2.1890	-0.1250	0.5133	2.4104	0.3356	1.7165	4.9493	-0.4945
Kurtosis	2.4178	2.2426	1.9178	14.4992	12.0860	1.9199	7.9735	3.0568	4.9384	8.6806	3.1668	7.1648	28.8548	1.2445
Jarque-Bera	15.4776	118.4909	71.5304	7139.3810	5041.6210	63.6650	1920.7230	2.8772	210.4933	2428.5050	20.9214	1274.4640	33532.2800	177.6150
Probability	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.2373	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050

Panel B	DEF	MKTTIM	DIV	DIVDUMMY	AGE	RSI	UNR	RAT	GB	ASI	INF	GDPG	TS
Mean	0.1955	0.3635	0.3898	0.7143	3.7794	25.9230	7.9851	0.1829	0.2620	0.1269	0.1229	0.0575	0.0179
Median	0.1259	0.1946	0.3579	1.0000	3.8286	16.0886	7.9921	0.0000	0.2240	0.1071	0.1180	0.0631	0.0158
Maximum	0.9920	1.8932	1.0000	1.0000	4.5643	98.1561	12.1094	1.0000	0.6354	0.7473	0.2381	0.1460	0.0755
Minimum	-0.2500	-2.0916	0.0000	0.0000	1.7918	3.0149	4.9700	0.0000	0.0748	-0.4577	0.0656	-0.0162	-0.0238
Std. Dev.	0.2871	0.7977	0.3453	0.4520	0.3773	26.2868	1.6619	0.3867	0.1698	0.3303	0.0413	0.0371	0.0220
Skewness	0.9624	-0.0597	0.3421	-0.9487	-1.2800	1.6360	0.1956	1.6409	0.7727	0.1660	0.9033	0.1278	0.7192
Kurtosis	3.7380	4.2017	1.7865	1.9000	6.4395	4.6886	2.5231	3.6925	2.4382	1.9674	3.7664	2.9874	3.9104
Jarque-Bera	185.92	63.81	84.90	210.44	804.26	593.13	16.65	492.17	118.29	51.47	168.48	2.87	126.78
Probability	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0000	0.2384	0.0000
Observations	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050

Source: Authors' Estimation

Notes: Book leverage is the ratio of total book liabilities to total assets. Market leverage I (ML1*t*) is the ratio of the book value of financial debt to the total market values of financial debt and equity. Market leverage

II (ML2*t*) is the ratio of total book liabilities to sum of market value of equity and book liabilities. MTR is the marginal tax rate defined as tax expense divided by pre-tax profit. NDTS is the non-debt tax shield defined as depreciation and amortization divided by total assets less current liabilities, TANG is the value of tangible assets defined as property plant and equipment divided by total assets, TOBINQ is the ratio of market value to book value of the total assets, SIZE is the natural logarithm of sales, GROWSL is the growth in sales, VOL is earnings volatility defined as the ratio of standard deviation of operating earnings to value of operating earnings, PROF is profitability measured as the ratio of operating earnings to capital employed, QUICK is quick or acid-test ratio measured as the ratio of quick assets to current liabilities (quick assets = current assets less inventory), RD is the ratio of research and development and other intangible assets to "total assets less current liabilities", UNQ is uniqueness dummy- one if a firm is in a sensitive industry or zero otherwise, DEF is financing deficit defined as the excess of capital expenditures over operating cash flows, MKTTIM is the market timing variable that defines opportunistic refinancing measured by the product of market-to-book equity and financing deficit, DIV is the dividend payout ratio defined as dividends divided by after-tax earnings, DIVDUMMY is dividend dummy variable – one if a firm pays dividend in a fiscal year and zero otherwise, AGE is the natural logarithm of the years since incorporation of firm, RSI is relationship specific investments defined as ratio of bought-in-goods-and-services to depreciation, UNR is unionization ratio defined as natural log of the value-added per employee, RAT is the rating dummy which assumes one if a firm's debt is rated and zero otherwise, GB is government borrowing measured by the ratio of government debt to GDP ratio, ASI is annual change in all-share index to gauge equity market movements, INF is inflation rate which is change in consumer price index, GDPG is growth in real GDP to signify economic growth , TS is term spread measured by the spread between average yield on government long-term bonds and the treasury bill yield.

Table 3. Summary Statistics of Leverage, Firm-level and Macroeconomic Explanatory Variables - Panel A & Panel B

Appendix-IV

	BLT	ML1T	ML2T	MTR	NDTS	TANG	TOBINQ	SIZE	GROWSL	VOL	PROF	QUICK	RD	UNQ	DEF	MKTTIM	DIV	DIVDUMMY	AGE	RSI	UNR	RAT	GB	ASI	INF	GDPG	TS
BLT	1.0																										
ML1T	0.4	1.0																									
ML2T	0.6	0.8	1.0																								
MTR	0.0	-0.2	-0.2	1.0																							
NDTS	0.2	0.0	0.1	0.1	1.0																						
TANG	0.0	0.0	-0.2	0.0	0.0	1.0																					
TOBINQ	0.0	-0.4	-0.5	0.2	0.0	0.2	1.0																				
SIZE	0.0	-0.3	-0.2	0.3	0.0	0.2	0.4	1.0																			
GROWSL	0.0	-0.1	-0.1	0.2	0.0	0.0	0.1	0.2	1.0																		
VOL	0.3	0.0	0.1	-0.2	0.1	0.0	0.1	-0.1	0.0	1.0																	
PROF	0.0	-0.3	-0.2	0.3	0.1	0.0	0.3	0.2	0.1	0.0	1.0																
QUICK	-0.3	-0.3	-0.2	0.2	-0.1	-0.3	0.0	0.1	0.1	-0.1	0.1	1.0															
RD	0.1	0.0	0.0	0.1	0.0	0.1	0.1	0.3	0.1	0.0	0.0	0.0	1.0														
UNQ	0.0	0.2	0.3	0.0	0.1	-0.3	-0.3	-0.5	0.0	-0.1	-0.1	0.0	-0.1	1.0													
DEF	0.4	0.2	0.2	0.0	0.2	0.0	0.0	-0.1	0.1	0.1	-0.1	-0.2	0.0	-0.1	1.0												
MKTTIM	0.0	-0.1	-0.1	0.1	0.1	0.0	0.4	0.1	0.0	0.0	0.2	0.0	0.1	-0.1	0.5	1.0											
DIV	-0.2	-0.4	-0.4	0.3	0.0	0.0	0.3	0.4	0.1	-0.2	0.4	0.1	0.1	-0.3	-0.2	0.1	1.0										
DIVDUMMY	-0.2	-0.4	-0.4	0.3	0.0	-0.1	0.2	0.4	0.1	-0.2	0.4	0.3	0.0	-0.2	-0.2	0.1	0.7	1.0									
AGE	0.1	0.0	0.0	-0.1	-0.1	0.0	0.2	0.4	0.0	0.0	0.0	-0.1	0.1	-0.1	-0.1	0.0	0.0	0.0	1.0								
RSI	0.2	-0.1	0.0	0.1	-0.1	-0.2	0.1	0.3	0.1	0.2	0.1	0.1	0.1	-0.3	0.0	0.0	0.2	0.1	0.2	1.0							
UNR	0.0	-0.2	-0.3	0.1	-0.1	0.1	0.3	0.7	0.1	-0.2	0.2	0.1	0.3	-0.4	-0.1	0.1	0.3	0.3	0.4	0.2	1.0						
RAT	-0.1	0.2	0.1	0.0	0.0	0.0	-0.2	0.1	0.0	-0.1	0.0	0.1	0.0	0.0	-0.1	-0.1	0.0	0.1	0.2	0.0	0.0	1.0					
GB	0.0	0.1	0.1	0.0	0.1	0.0	-0.1	-0.2	0.0	0.1	0.0	-0.1	0.1	0.0	0.1	0.0	0.1	0.0	-0.2	0.0	-0.3	0.0	1.0				

ASI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	-0.2	0.0	0.2	1.0			
INF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.1	1.0		
GDPG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.1	0.1	0.2	0.0	-0.1	0.0	0.1	0.0	0.0	-0.1	-0.2	0.0	-0.3	0.0	0.0	0.2	0.0	1.0	
TS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	-0.2	1.0

Source: Authors' Estimation

Table 4. Correlation Matrix

Appendix-V

Dep. Variables	Leverage Regressions								
	Book Leverage (BL*t*)			Market Leverage (ML1) Regressions			Market Leverage II (ML2) Regression		
	VAR	GMM	GMM	VAR	GMM	GMM	VAR	GMM	GMM
CONSTANT	0.2139*** (3.8750)	-0.0513*** (-3.2181)	0.2242*** (4.2233)	0.0528 (0.8364)	-0.0306** (-1.7142)	0.1089* (1.7090)	0.7211*** (23.0395)	-0.0641*** (-3.218)	0.1049* (1.7605)
BL_{t-1}/ $ML1_{t-1}$/$ML2_{t-1}$	0.7387*** (23.8614)	1.0900*** (45.5298)	0.7742*** (42.6833)	0.7796*** (25.0132)	1.0516*** (40.3024)	0.7945*** (19.2502)	0.0745** (2.5068)	1.0601*** (45.530)	0.812*** (27.0068)
BL_{t-2}/ $ML1_{t-2}$/$ML2_{t-2}$	0.0509* (1.6821)			0.0487 (1.5999)			0.0622 (1.0099)		
MTR	0.0275** (2.0644)		0.0261** (1.9676)	0.0058 (0.3774)		0.0018 (0.1180)	0.0155 (1.0385)		0.0157 (1.0621)
NDTS	0.0436 (1.6375)		0.0486* (1.8852)	-0.0266 (-0.8842)		-0.0228 (-0.7716)	0.0724** (2.4402)		0.0747*** (2.5817)
TANG	-0.0268** (-2.0400)		-0.0293** (-2.2479)	-0.0030 (-0.2018)		-0.011909 (-0.7905)	-0.0358** (-2.4288)		-0.0353** (-2.4162)
TOBINQ	0.0021** (2.1139)		0.0023** (2.3699)	-0.0057*** (-4.9689)		-0.0053*** (-4.1229)	-0.0065*** (-5.6620)		-0.0057*** (-4.5216)
SIZE	-0.0013 (-0.4362)		-0.0030 (-1.0334)	0.0032 (0.9817)		0.0013 (0.3813)	0.0081** (2.4898)		0.0054* (1.6568)
GROWSL	-0.0023 (-0.1843)		-0.002037 (-0.1670)	-0.0229* (-1.6169)		-0.0280** (-1.9892)	-0.0412*** (-2.969)		-0.0442*** (-3.2467)
VOL	0.1072*** (5.5132)		0.1057*** (5.5906)	-0.0164 (-0.7524)		-0.0206 (-0.9626)	0.0182 (0.8482)		0.0194 (0.9238)
PROF	-0.0399*** (-2.8553)		-0.0414*** (-2.9729)	-0.0066 (-0.4118)		-0.0092 (-0.5683)	-0.0149 (-0.9525)		-0.0209 (-1.3395)
QUICK	-0.0535*** (-6.5474)		-0.0533*** (-6.5355)	-0.0201** (-2.1813)		-0.0244** (-2.4119)	-0.0188** (-2.0995)		-0.0179** (-1.9689)
RD	0.0311 (0.9548)		0.0324 (0.9822)	0.1207*** (3.2339)		0.1308*** (3.3832)	0.043855 (1.2036)		0.0434 (1.182)
UNQ	0.0094 (1.1050)		0.0055 (0.6572)	0.0118 (1.2165)		0.0121 (1.2221)	0.0182* (1.8883)		0.0110 (1.1254)
DEF	0.0560*** (3.7583)		0.0664*** (4.5472)	-0.0106 (-0.6513)		0.0064 (0.3932)	-0.0038 (-0.2373)		0.0041 (0.2584)
MKTTIM	-0.0109** (-2.0484)		-0.0128** (-2.4439)	0.0100* (1.6666)		0.0065 (1.0850)	0.0033 (0.5649)		0.0012 (0.2088)
DIV	0.0122 (0.8616)		0.0138 (0.9755)	0.0188 (1.1568)		0.0043 (0.2568)	-0.0049 (-0.3048)		0.0011 (0.0703)
DIVDUMMY	-0.0221** (-1.9645)		-0.0226** (-2.0166)	-0.0577*** (-4.4649)		-0.0538*** (-4.0844)	-0.0565*** (-4.4469)		-0.0526*** (-4.1321)
AGE	-0.0194* (-1.7386)		-0.0146 (-1.3680)	-0.0003 (-0.0239)		-0.0043 (-0.3495)	-0.0006 (-0.0507)		-0.0054 (-0.4521)
RSI	0.0004*** (2.6560)		0.0004*** (2.8247)	-4.45E-05 (-0.2685)		-2.65E-05 (-0.1590)	0.0003** (2.0292)		0.0003* (1.7929)
UNR	0.0045 (1.4039)		0.0057* (1.7956)	-0.001725 (-0.4660)		-0.0003 (-0.0799)	-0.0059 (-1.6136)		-0.004581 (-1.2538)
RAT	0.0206** (2.2883)		0.0166** (1.8602)	0.0208** (1.9979)		0.0212** (1.9192)	0.0046 (0.4600)		0.0069 (0.6980)
GB	0.0434 (1.4341)	0.0475 (-0.6351)	0.0264 (0.9878)	0.0215 (0.6173)	-0.0235 (-0.7002)	0.0207 (0.6574)	0.0167 (0.4841)	-0.0210 (-0.635)	0.0260 (0.8509)
ASI	-0.0092 (-0.8932)	-0.0062*** (-7.0069)	-0.0106 (-1.0123)	-0.0507*** (-4.2974)	-0.0544*** (-4.2020)	-0.0516*** (-4.2856)	-0.082317 (-7.1047)	-0.0893*** (-7.007)	-0.0841*** (-7.1817)
INF	-0.0037 (-0.0400)	0.0061*** (3.7053)	0.0160 (0.1727)	0.1745* (1.6237)	0.2210** (1.8917)	0.1732 (1.6018)	0.3358*** (3.1687)	0.4271*** (3.7053)	0.3240*** (3.0789)
GDPG	-0.2384** (-2.1462)	-0.1378 (0.9667)	-0.2146** (-1.9781)	0.0548 (0.4296)	0.0902 (0.7550)	0.0335 (0.2621)	-0.0235 (-0.1866)	0.1138 (0.9667)	-0.0571 (-0.4618)
TS	-0.3217** (-2.1296)	-0.3828** (-2.0130)	-0.3208** (-2.0997)	-0.1356 (-0.7847)	-0.1933 (-1.0258)	-0.141489 (-0.8026)	-0.4032** (-2.3807)	-0.3733** (-2.013)	-0.4056** (-2.3741)
Adj. R^2	0.7920	0.7121	0.7859	0.8148	0.7627	0.8046	0.8245	0.7730	0.8189
Durbin-Watson		2.1917	1.9329		2.1457	1.9653		2.2595	2.1995
Observations	950	1000	1000	950	1000	1000	950	1000	1000

Source: Authors' Presentation

Notes: * indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%

Coefficients, *t*-statistics (in parentheses) and statistical significance are reported. Standard errors adjust for heteroscedasticity and clustering at the firm level. 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 results presented here are on the bases of the generalized method of moments (GMM) and vector autoregression (VAR).

Table 5. Capital Structure Regressions to Explain Book and Market Leverage Ratios

Appendix-VI

Dependent Variables	**Change in Book Leverage (*Δ*BL*t*)**	**Book Leverage (BL*t*)**	**Change in Market Leverage I (*Δ*ML1*t*)**	**Market Leverage I (ML1*t*)**	**Change in Market Leverage II (*Δ*ML2*t*)**	**Market Leverage II (ML2*t*)**
Firm-Level Regressors						
Financing Deficit	0.0217* (1.8126)	0.2692*** (12.5299)	0.0096 (0.7039)	0.1487*** (5.4162)	0.0050 (0.3673)	0.1877*** (6.8814)
Intercept	-0.0033 (-0.7919)	0.5707*** (76.4839)	-0.0018 (-0.3770)	0.2462*** (25.8172)	-0.0003 (-0.0675)	0.4361*** (46.0351)
Adjusted R^2	0.0023	0.1295	0.0004	0.0263	0.0001	0.0432

Source: Authors' Presentation
Notes: * indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%
Coefficients, *t*-statistics (in parentheses) and statistical significance from GMM estimation method are reported

Table 6. A Partial Test of the Pecking Order Hypothesis

ACKNOWLEDGEMENT

The authors are grateful for the constructive comments of the Editors and Reviewers.