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# THE EFFECTS OF CAPITAL STRUCTURE ON BANKS' PERFORMANCE, THE UGANDAN PERSPECTIVE

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## Abstract

The paper aims to investigate the effects of capital structure on banks' performance on Ugandan banks for a ten years period, 2006–2015 with a sample of 20 commercial banks. The study employs four performance indicators of return on equity, return on assets, net interest margin and cost to income ratio to determine bank performance. Panel regression models are used to determine the effects of capital structure on bank performance. Independent variables are sub-divided into capital structure variables namely; long-term debt to total assets, short-term debt to total assets and total debt ratio and then control variables are bank size and tangibility of assets. Results portray that there is a positive relationship between capital structure variables and bank performance. It's between long-term debts, total debt with net interest margin. There is also a positive relationship between total debt and return on assets. It is still the same between total debt and returns on equity. However, there is a negative relationship between short-term debt and return on assets. The results also signify a positive relationship between bank size and net interest margin. It is still the same between bank size and returns on equity plus return on assets. There is a negative relationship between the tangibility of assets and net interest margin. It is also the same with return on equity. The findings propose that profitable banks rely more on debt financing as their financing option. This is advanced by the fact that approximately 68 % of total assets are represented by short-term debts for Uganda's commercial banks. This further implies that Ugandan banks largely depend on short-term debt financing for their business operations compared to long-term debt. Hence the study recommends that executive banking management teams plus policymakers should design prudent financing decisions aimed at reducing overreliance on debts to yield optimal capital structure levels. This will enable banks to remain at the top of the profitability game competitively in the banking industry.

Keywords: banks performance, capital structure, return on equity, return on assets

## INTRODUCTION

Capital structure has always been a topic of controversy in the field of corporate and modern finance; different researchers have different views and theories as they strive to determine an optimum capital structure to minimise a company's cost of capital and maximise its value. This is a similar situation with banks though somewhat different regarding focus. Banks are very crucial

institutions for the success of any economy. Thus their primary task is to receive funds from investors and then lend out to the business community that could be in need of it. Hence, with such functions, banks have always been bothered about the payoff of debts and liquidity, and such success can only be achieved by banks depending on systems they put in place to identify, evaluate, monitor and manage risks. Meanwhile, there has been tremendous growth of literature on the banks 'efficiency in the developed world (Athanasoglou *et al.*; 2008) and little in the developing economies such as Uganda. Hence investigating the effects of capital structure on banks' performance has substantive policy implications especially in a developing economy like Uganda.

From the argument above, this paper intends to find out how capital structure can influence the profitability and efficiency of the banking industry in Uganda. This paper is structured as follows; section 1 is composed of an introduction and also covers an overview of the banking industry in Uganda, section 2 covers literature review, section 3 covers the methodology, and 4 covers results and their discussion and section 5 covers the conclusion with possible recommendations.

Previous studies on commercial banks in Uganda have been on financial liberalisation, Kasekende and Atingi-Ego (2003), market structure and performance in Uganda's banking sector (Mugume, 2010). This implies that there is a deficiency of empirical works about capital structure and banks' performance in Uganda. Hence, it's upon this background that the paper seeks to bridge that gap.

It's important to note that studies about Uganda's banking industry, in general, are limited as little is known about the effects of capital structure on banks' performance for Uganda. Banks to grow and survive, they usually operate in a very competitive atmosphere both at a national and global level to expand their operational horizons for new investment opportunities (Noorani *et al.*, 2013). Banks also extend liquidity on demand to depositors via current accounts and loans to their customers through different forms of credit (Kashyap *et al.*, 1999).

According to Jayaratne and Morgan (1999), shifts in deposit supply affect the lending of small banks which do not have access to significant internal capital funds. Houston *et al.* (1997) realised that extending credit to customers at big banks is less influenced by the cash flow and capital.

Abor and Biekpe (2005) found that debt finances more than fifty per cent of assets of listed firms in Ghana and that there is a significantly positive relationship between short-term debt and total debt and return on equity.

## Status of the banking sector in Uganda

Banks' performance in Uganda has deteriorated in the past years in the form of increased loan defaults and closure of some banks. In 2012, Bank of Uganda closed down National Bank of Commerce, a local commercial bank owned by private domestic investors. Its deposits were liquidated to Crane Bank, under the directive and control of the Bank of Uganda (Rupiny, 2012).

More so, the sector in Uganda has gone through a series of revolutions especially in early 2000; it experienced restructuring as several local commercial banks were publicly declared insolvent, taken by Bank of Uganda and finally liquidated. This resulted in the passing of 2004 legislative bill which got enacted and termed as "The Financial Institutions Act 2004" upon financial institutions composed of governance and compliance guidelines to improve and strengthen financial sector based on principles of corporate governance, transparency and accountability. Hence in 2008–2009, several existing institutions went through a massive branch expansion either by opening up new ones or through mergers and acquisitions resulting in tremendous growth in the banking industry in Uganda.

## Related literature review

Capital structure decision is the mix of equity and debt that a firm uses to finance its business operations (Damodaran, 2001). Researchers advanced many critical theories of the capital structure such as the Modigliani Miller, static trade-off, and pecking order, among others for purposes of determining right analytical financial decisions; for instance, Modigliani and Miller (1958) assume a perfect capital environment free from taxes, and trade-off considers taxes. After the presentation of their first paper on capital structure irrelevancy in 1958, Modigliani and Miller came up to support capital structure relevancy and its optimal nature in 1963.

According to the static trade-off theory firms trade-off costs and benefits of capital that enable them to optimally balance the target of debt to equity ratio to score maximum value for the firm( Modigliani and Miller, 1963). Pecking order model, Myers and Myluf (1984) appreciate the model's incorporation of information asymmetry and

transaction costs. They noted a negative inverse relationship between debt ratio and profitability for firms because firms consider the hierarchy of financing sources and prefer internally generated funds when the need arises and equity as a last resort. Rajan and Zingales, (1995) carried out a study on G7 countries of the developed world and identified a negative relationship between firm leverage and strong firm performance.

## More past empirical studies on capital structure

Some previous studies have realised a relationship between capital structure and firm performance. However, some have found out positive impacts as others negative impacts or no impacts at all.

### Positive relationship

Nikoo (2015) identified a positive effect of capital structure on banks' performance using data of seventeen commercial banks from 2009 through 2014. Salteh *et al.* (2012) investigated the impact of capital structure on the performance of the profitability twenty-eight firms from Tehran stock exchange. They employed data for 2005–2009 and realised positive impacts of capital structure variables such as long-term debts to total assets, short-term debt to total assets and total debt to total assets on the performance proxies of return on equity and Tobin's Q.

Umar *et al.* (2012) employed data on a hundred listed firms from 2006 to 2009 and identified a significant positive association between capital structure and firm performance. They used long-term debt obligations to total assets, short-term debt obligations and total debt obligations to total assets as capital structure variables on performance proxies such as earnings per share, return on assets and net profit margin. Hutchson (1995) realised financial leverage had a positive impact on the firms' return on equity provided that the earnings of the companies exceed the average interest cost of the debt to the businesses. Berger and Bonaccorsi di Patti (2006) designed profit efficiency as a measure of performance of firms and found out that high leverage is positively related to profit efficiency.

Arbabiyan and Safari (2009) employed data for a hundred firms for 2001–2007 observed a positive association between total debt to total assets and short-term debt to total assets with return on equity. On the other hand, the authors realised an inverse association between long-term debt to total assets and return on equity. Though, the main weakness of this study was that they only used a single performance proxy of return on equity. In a related development, Abor (2005) analysed the impacts of capital structure on the firm performance of listed firms on Ghana stock exchange and realised a positive relationship between short-term debt to total assets and total debt to total assets on return on equity. Meanwhile, he also identified a negative association between long-term debt to total assets and return on equity.

### Negative relationship

Contrary to the positive impacts of capital structure on performance, a quite number of other scholars and researchers have observed negative results, and these include the following below;

Ramadan and Ramadan(2015) employed capital structure variables that included short-term debt to total assets, long-term debt to total assets and total debts to total assets on the performance of Jordanian firms. They employed pooled ordinary least squares and realised a negative impact of capital structure variables on return on equity using data of seventy two firms for the period 2005–2013.

Abdel-Jalil (2014) used multiple regression analysis and identified a significant inverse influence of debt ratio and the fraction of debt to equity on the rate of return produced from investment activities (ROI). Titman and Wessel (1988) suggested that asset structure, growth, industrial classification, earnings, size, profitability, and volatility are factors that may affect leverage given the different theories of capital structure.

### No relationship

As other studies observed and established positive or negative impacts of the capital structure on profitability, others realised no connection between the two like;

Al-Taani (2013) investigated the relationship between capital structure choices with the profitability of Jordanian firms. He employed data from 2005 to 2009 and realised no statistically significant association between capital structure (debt ratio) and profitability (*ROA*). Ebaid (2009) analysed the impact of capital structure decision on firm performance. Thus employing data of 64 listed firms on the Egyptian stock exchange market for 1997–2005 period. He performed the analysis using multiple regressions and found from a weak to no impact.

## MATERIALS AND METHODS

This section identifies the data used to achieve the objectives of the study. It covers sources of data, population, sample and sampling method, variables identification plus model specification.

This study applied an explanatory approach as it used a strongly balanced panel data set of twenty commercial banks out of twenty-five banks for 2006 to 2015 which generated a total of 200 year-bank observations. Banks selected exclude central or bank of Uganda. The Ugandan banking sector has twenty-five banks consisting of both local and foreign banks (Bank of Uganda, 2016). This paper aimed to investigate the effects of capital structure on banks' performance in Uganda. The study employed annual data from the Bank scope database, the central bank of Uganda, the African development bank plus published annual income financial statements together with balance sheets from the banks' websites. This was done to be able to estimate the necessary ratios and coefficients required for the investigation.

As noted from Tobias and Themba (2011), the advantage of utilising panel data is that it controls for individual heterogeneity, less collinerity within variables and also contains trends in data which time series data may not be able to solve. According to Miles and Huberman (1999) plus Kumar and Phrommathed (2005), the chosen sample of the target population should be purposive instead of being random. The sample size was studied from the perspective of the primary objective of the study and was limited to only subjects from which relevant information could be obtained. Therefore, the study adopted a convenience sampling approach. It was essential to use this technique due to the availability of bank data required which was convenient for the researcher. Furthermore, the study chose to use the variables in question and dropped variables like leverage because it had strong correlations in the models and capital adequacy ratio was insignificant within the models, hence dropped as well. However, the study could not use variables like Tier 1 and Tier 2 because that data on these variables were not readily available.

Data were analysed using descriptive statistics, correlational analysis. Descriptive statistics were employed to determine the mean and standard deviations of the variables employed in the study. The study used panel regressions and *OLS* to achieve the aim of the study. As noted in Brooks (2008) in the field of financial research, there are two ways of panel estimators, namely a fixed effects model plus random effects model. Hence the Hausman specification test was conducted to identify the appropriate models for the study. The study also employed Augmented Dickey-Fuller test (using Levin-lin-Chu) to test for stationarity of the variables used. In a related development variation inflation factor (*VIF*) was used to check for multicollinerity issues.

### Choice of variables

The current study attempts to examine the effects of capital structure on Uganda's commercial banks employing both dependent and independent variables. The dependent variable of the present study is the bank performance and represented by the following four performance proxies. Performance indicators are return on equity (*ROE*), return on assets (*ROA*), cost to income (*CTI*) and net interest margin (*NIM*) are computed as below. These proxies were chosen because of the fact that they have been applied in several previous empirical studies in the contemporary literature as per the foregoing details, hence, their selection and consequent consideration in the models as well as examining their effect or contribution in regards to Uganda's commercial banks' situation for the period under investigation.

*ROE* is a good performance proxy (Akeem *et al.*; Salim and Yadav; 2012). *ROE* measures the effectiveness of shareholders' funds used by the executive bank management team. The study also applies *ROA* as it has been used before in several past studies (Rouf, 2015; Ramadan and Ramadan, 2015). Furthermore, the study uses the net interest margin as a performance proxy as well because it has been used in the past studies (Dermirguc-kunt and Huizinga, 1999). Finally, the study uses cost to income ratio as another performance proxy since it measures the efficiency of a bank (Pasiouras and Kosmidou, 2007).

*ROE* is termed as the ratio of net income to average equity while *ROA* is termed as the ratio of net income to average total assets. *CTI* is bank operating expenses to net interest income while *NIM* is net interest income to average earning assets. *ROE* and *ROA* are used since they are essential accounting measures of financial performance (Onaolapo & Kajola, 2010). Net interest margin is included because banks' profits largely depend on interest income from their business operations. The cost to income ratio is included as a measure of bank operational efficiency.

Independent variables for the study are capital structure variables and control variables.

I: *Variables and definitions of the current study*

| Number | Symbols | Description | Definition | expected sign (–/+) |
|---|---|---|---|---|
| 1 | ***ROE*** | Return on equity | Net income to average equity | |
| 2 | ***ROA*** | Return on assets | Net income to average total assets | |
| 3 | ***CTI*** | Cost to income ratio | Bank operating expenses to net interest income | |
| 4 | ***NIM*** | Net interest margin | Net interest income to average earnings assets. | |
| 5 | ***BSZ*** | Bank size | Natural log of total bank assets | –/+ |
| 6 | ***TANG*** | Tangibility of Assets | The fraction of fixed assets to total assets of banks | –/+ |
| 7 | ***SDA*** | Short-term debt | The ratio of short-term debt to the total assets of banks for less than a year | –/+ |
| 8 | ***LDA*** | Long-term debt | The fraction of long-term debt to total assets of the banks for more than a year | –/+ |
| 9 | ***TD*** | Total debt | Is banks' total debts to total assets | –/+ |

The former includes short-term debt ratio (*SDA*), long-term debt ratio (*LDA*) and total debt (*TD*).

*SDA* is short-term debt to total assets and measures a ratio of banks' assets that are financed by loans and other financial obligations less than one year while *LDA* is long-term debt to total assets of the bank and measures a ratio of banks' assets that are financed by loans or other financial obligations for more than a year as *TD* measures banks' total debts to total assets (both long and short-term debts). These variables have earlier been used by Shubita and Alsawalhah (2012).

Control variables are used because of their unchanging nature which permits the relationship between different variables being tested to be better examined. These are bank size and tangibility of assets (*TANG*).

Bank size (*BSZ*) is measured using the natural log of total bank assets. Penrose (1995) stresses that larger banks enjoy economies of scale and these can influence performance, hence use of it as a control variable.

Tangibility is a fraction of fixed assets to total assets of banks. Banks with a high percentage of tangible assets in the asset base made the debt choice more likely and influenced firm performance (Akintoye, 2008).

## Model specification

Capital structure has been studied by several authors using varied research designs to investigate the capital structure and bank performance. This study adopts the approach and model used by Shubita & Alsawalhah (2012), and its original version is as:

$$ROE_{it} = \beta_0 + \beta_1 SDA_{it} + \beta_2 SIZE_{it} + \beta_3 SG_{it} + \beta_4 BSZ_{it} + \varepsilon_1 \quad (1)$$

$$ROE_{it} = \alpha_0 + \alpha_1 LDA_{it} + \alpha_2 SIZE_{it} + \alpha_3 SG_{it} + \varepsilon_2 \quad (2)$$

$$ROE_{it} = \lambda_0 + \lambda DA_{it} + \lambda_2 SIZE_{it} + \lambda_3 SG_{it} + \varepsilon_3 \quad (3)$$

Where:
*DA* is Total debt/total assets, *SIZE* is natural log of total assets of banks, *SG* is growth which isCurrent year's sales less previous years' sales / previous year's sales, $\alpha_0$, $\lambda_0$ = Intercepts of the equation.

However, the current study modifies this model by including in other relevant performance indicators such as return on assets (*ROA*), cost to income ratio (*CTI*) and net interest margin (*NIM*) and it also considers tangibility of assets as one of the control variables. Hence, however, since the current study has considered 4 variables namely *ROE*, *ROA*, *CTI* and *NIM* to determine banks' performance. Thus following the anticipated relationships provided in Tab. I equation (4), equation (5), equation (6) and equation(7) for *ROE*, *ROA*, *CTI* and *NIM* respectively can be written as below:

$$ROE_{it} = \beta_0 + \beta_1 SDA_{it} + \beta_2 LDA_{it} + \beta_3 TD_{it} + \beta_4 BSZ_{it} + \beta_5 TANG_{it} + \varepsilon_{it} \quad (4)$$

$$ROA_{it} = \beta_0 + \beta_1 SDA_{it} + \beta_2 LDA_{it} + \beta_3 TD_{it} + \beta_4 BSZ_{it} + \beta_5 TANG_{it} + \varepsilon_{it} \quad (5)$$

$$CTI_{it} = \beta_0 + \beta_1 SDA_{it} + \beta_2 LDA_{it} + \beta_3 TD_{it} + \beta_4 BSZ_{it} + \beta_5 TANG_{it} + \varepsilon_{it} \quad (6)$$

$$NIM_{it} = \beta_0 + \beta_1 SDA_{it} + \beta_2 LDA_{it} + \beta_3 TD_{it} + \beta_4 BSZ_{it} + \beta_5 TANG_{it} + \varepsilon_{it} \quad (7)$$

Where:
*ROE* = Return on Equity, *ROA* = Return on Assets, *CTI* = Cost to Income, NIM = Net Interest Margin, SDA = Short-Term Debt, *LDA* = Long-Term

II: *Unit Root test table*

| Variable | p-value at level | p-value after first order difference | Decision |
|---|---|---|---|
| ***ROE*** | 0.0002 | | I(0) |
| ***ROA*** | 0.0000 | | I(0) |
| ***CTI*** | 0.0000 | | I(0) |
| ***NIM*** | 0.0000 | | I(0) |
| ***BSZ*** | 0.0000 | | I(0) |
| ***TANG*** | 0.0000 | | I(0) |
| ***SDA*** | 0.0000 | | I(0) |
| ***LDA*** | 0.0000 | | I(0) |
| ***ΔTD*** | 0.0571 | 0.0025 | I(1) |

Source: Author's calculations from STATA, 2018

Debt, *TD* = Total debt, BSZ = Bank Size and *TANG* = Tangibility of assets, $\varepsilon_{it}$ = Error term.

As observed from Tab. II a panel unit root test (Levin-lin-Chu) was performed to find out whether the variables used were stationary. The variables used were stationary at level apart from one variable namely; total debt. Where Δ means first order difference.

Tab. III provides a summary of descriptive statistics of both dependent and independent variables for sampled banks. Four measures of profitability are used, namely; return on equity, return on assets, cost to income ratio and net interest margin. *ROE* is a measure of the contribution of net income per Ugandan Shilling invested by the bank's shareholders. Thus, the efficiency of the owners' capital spent. *ROA* measures revenue banks generate from their total assets while *CTI* measures efficiency level of banks. *NIM* measures the differences existing between bank interest income and other financial institutions and interest expenses to lenders.

Results reveal average percentages of 5.61, 0.87, 62.82 and 6.86 for the above performance indicators respectively. This demonstrates a good performance for the period under consideration, comparing 5.6 % of *ROE* to evidence of Abor (2005) for Ghana with average *ROE* of 3.7 %, Gill *et al.* (2011) in the United States with *ROE* of 2.8 %. Ugandan banks have performed better and need to consistently demonstrate this kind of performance in the coming years to ensure stability and resilience.

Capital structure variables are the long-term debt to assets, short-term debt to assets and total debt ratio and their average values are 0.0441258, 0.6848179 and 8062.198 respectively. This indicates that approximately 0.0441258 % and 0.6848179 % of total assets are represented by long-term debts and short-term debts respectively, implying that Ugandan banks largely depend on short-term

III: *Descriptive statistics*

| Variables | Observations | Mean | Std.dev | Min | Max |
|---|---|---|---|---|---|
| ***ROE*** | 200 | 5.60858 | 26.86503 | –120.617 | 66.671 |
| ***ROA*** | 200 | 0.86855 | 3.649733 | –13.904 | 6.375 |
| ***CTI*** | 200 | 62.81857 | 83.26668 | 0 | 578.769 |
| ***NIM*** | 200 | 6.862675 | 5.231602 | –0.619 | 24.233 |
| ***BSZ*** | 200 | 8.739258 | 5.404793 | 0 | 14.06416 |
| ***TANG*** | 200 | 0.0275537 | 0.0349286 | 0 | 0.192951 |
| ***SDA*** | 200 | 0.6848179 | 0.475532 | 0 | 1.791113 |
| ***LDA*** | 200 | 0.0441258 | 0.0846708 | 0 | 0.4509422 |
| ***TD*** | 200 | 8062.198 | 92628.9 | –792883.4 | 508679.8 |

Source: Author's calculations from STATA, 2018

IV: *Correlation Matrix*

| | ***ROE*** | ***ROA*** | ***CTI*** | ***NIM*** | ***BSZ*** | ***TANG*** | ***SDA*** | ***LDA*** | ***TD*** |
|---|---|---|---|---|---|---|---|---|---|
| ***ROE*** | 1.000 | | | | | | | | |
| ***ROA*** | 0.9048 | 1.0000 | | | | | | | |
| ***CTI*** | –0.5706 | –0.5709 | 1.0000 | | | | | | |
| ***NIM*** | 0.3631 | 0.3776 | 0.1330 | 1.0000 | | | | | |
| ***BSZ*** | 0.2189 | 0.2315 | 0.3927 | 0.8066 | 1.0000 | | | | |
| ***TANG*** | –0.4294 | –0.5062 | 0.6064 | 0.3698 | 0.4199 | 1.0000 | | | |
| ***SDA*** | 0.2040 | 0.1841 | 0.4073 | 0.7574 | 0.8823 | 0.3901 | 1.0000 | | |
| ***LDA*** | 0.0171 | 0.0923 | 0.0863 | 0.4145 | 0.2858 | 0.2275 | 0.1584 | 1.0000 | |
| ***TD*** | 0.1324 | 0.1070 | 0.1025 | 0.2742 | 0.3269 | 0.2212 | 0.3545 | 0.0491 | 1.0000 |

Source: Author's calculations from STATA, 2018

debt financing for their operations compared to long-term debt.

Bank size and tangibility of assets are used as control variables. Average bank SIZE value was 8.739258 as mean value for *TANG* recorded was 0.0275537 which shows that the proportion of fixed assets as collateral in the banking industry may not be enough.

Tab. IV explains the correlation between the various performance variables (*ROE*, *ROA*, *CTI* and *NIM*) with independent variables which influence bank performance of the Ugandan Banking industry. Correlation is defined as the dependence of one variable against the other. *ROE* has a significant positive correlation with total debt and bank size implying that an increase in one variable, *ROE* also increases.

This relationship is the same between *ROA* with total debt ratio and bank size. However, *ROE* exhibits a negative correlation with the tangibility of assets.

The cost to income ratio also exhibits a significant positive relationship with short-term debt ratio and tangibility of assets implying that an increase in one of these variables, cost to income ratio also increases. Using Net interest margin as a dependent variable, the correlation matrix indicates that there is a significant positive relationship between long-term debt, total debt and bank size. This is consistent with earlier evidence of Abor (2005) who found a positive relationship between both short-term debt and long-term debt and profitability measure. However, this is inconsistent with the findings of Ramadan and Ramadan (2015) who found a negative impact of capital structure variables such as long-term debt, short-term debt and total debt on profitability. *ROA* has a significant negative correlation with the tangibility of assets and short debt ratio. The implication is that, as the proportion of banks' fixed assets ratio or short-term debt ratio increases, *ROA* decreases and vice versa.

Observation of the results shows that *ROE* also exhibits the same significant positive relationship with variables such as bank size and total debt ratio.

Unlike, *ROA* and *ROE*, cost to income (*CTI*) has a significant positive relationship with the tangibility of assets and short-term debt ratio; however, total debt ratio had a significant negative relationship with cost to income ratio. The implication is that bank' efficiency (*CTI*) increases when tangibility of assets and short-term debt ratio increases respectively.

As for the *VIF* in Tab. V, if the results are less than 10 and the tolerance is near 0, then it means that multicollinerity issues do not exist (Gujarati, 2003). From the Tab. V, the values of *VIF* range from 1.23 to 6.83 for the variables used for the study.

Thus for that matter, all *VIF* results for the independent variables selected as in Tab. V were not more than 10 and hence qualify for use in the different models for this study since there is no multicollinerity problem amongst them.

## RESULTS AND DISCUSSION

Using two different but related models, namely fixed effects model and random effects model, regressions are run to determine the effect of capital structure on banks' performance of the Ugandan banking industry concerning the sample. This is observed as per the foregoing presentations in the different tables accompanied by the discussions respectively under this chapter.

V: *Shows the results of TV and VIF factors for capital structure variables and control variables*

| Independent variables | *VIF* | 1/*VIF* |
|---|---|---|
| ***BSZ*** | 6.70 | 0.149352 |
| ***SDA*** | 6.53 | 0.153170 |
| ***TANG*** | 1.23 | 0.812654 |
| ***LDA*** | 1.17 | 0.856352 |
| ***TD*** | 1.16 | 0.865402 |
| ***Mean VIF*** | 3.36 | |

Source: Author's calculations from STATA, 2018, *VIF* = Variation Inflation Factor

Firstly, Fixed Effect model is run with the assumption that unobserved effects are correlated with capital structure. Secondly, Random Effects model is run with an idea of reversing initial assumptions of correlation on the same covariates.

Data analysis was based on the panel regression models constructed. Hence, a panel regression analysis was run to estimate the coefficients of the variables used for the study. In each of these regressions, models for the respective performance indicators were run to ascertain the impact of variables on each performance indicator. Regression analysis is used to investigate the effects of capital structure on banks' performance which is measured by *ROE*, *ROA*, *CTI* and NIM respectively.

To determine the best model for the study whether fixed effect model or random effect, Hausman specification test was run to differentiate between the models

F (6,193) = 27.43, Prob > F = 0.0000,
R-squared = 0.4602.

R-squared for the regression is 0.4602 which implies that the explanatory variables employed in the model in the current study can explain 46 per cent of the variations in the financial performance metric which is return on average equity. The remaining 54 per cent of variations of the financial performance of commercial banks under investigation can be explained by other factors not included in the model. The F-statistics suggests that at least one of the independent variables is considerably related to bank performance.

In Tab. VI, using *ROE* as a dependent variable under fixed effects model, the total debt ratio had a profoundly positive effect on bank performance while other variables such as short-term debt and long-term debt were insignificant. With a positive impact on bank performance, it implies that an increase in total debt will increase bank profitability. These results are consistent with the findings of Nikoo (2015) who realised a positive effect of capital structure variables on bank performance when he used data from seventeen banks from 2009 to 2014. They are also in harmony with those of Umar *et al.* (2012) who employed data of one hundred listed firms from 2006 to 2009. As for short-term debt and long-term debt were insignificant. Hence, they confirmed to those of Al-Taani (2013) who analysed the capital structure choice with the profitability of Jordanian firms from 2005 to 2009 and realised no statistically significant relationship between *ROA* and debt ratio.

VI: *Regression model - –FE and RE–ROE*

| Variables | FE(*ROE*)model | RE(*ROE*)model |
|---|---|---|
| ***BANK SIZE*** | 1.562298** (2.09) | 1.940028 *** (2.66) |
| ***TANG*** | −382.896 *** (−7.70) | −417.3294 *** (−8.75) |
| ***SDA*** | −13.88516 (−1.54) | −12.49804 (−1.41) |
| ***LDA*** | −0.89356 (-0.04) | 0.8040787 (0.04) |
| ***TD*** | 0.000062 *** (3.88) | 0.0000556 *** (3.52 ) |
| ***CONS*** | 10.6248 *** (2.96) | 7.235943 (1.61) |

Source: Author's calculations from STATA, 2018, Robust standard errors in parentheses *$P < 0.10$, **$p < 0.05$, ***$p < 0.01$

VII: *Hausman specification test for ROE Model*

| | (b) | (B) | (b-B) | sqrt(diag(V_b-v_B)) |
|---|---|---|---|---|
| **Variables** | **(Fe)** | **(Re)** | **(Difference)** | |
| ***BANKSIZE*** | 1.562298 | 1.940028 | −0.3777309 | 0.1639689 |
| ***TANG*** | −382.896 | −417.3294 | 34.43343 | 14.1291 |
| ***SDA*** | −13.88516 | −12.49804 | −1.38712 | 1.88219 |
| ***LDA*** | −0.89356 | 0.8040787 | −1.697639 | 6.699576 |
| ***TD*** | 0.000062 | 0.0000556 | 6.37e-06 | 2.29e-06 |
| ***cons*** | | | | |

Source: Author's calculations from STATA, 2018

However, the current findings contradict those of Ramadan and Ramadan (2015) who found a negative impact of capital structure on the performance of Jordanian firms. They examined data from 2008 through 2012 using variables such as long-term debt, short-term debt and total debt. More so, bank size had a significant positive effect on bank performance. This means that an increase in bank size will increase banks' performance. The tangibility of assets had a significant negative performance on banks' performance. This implies that an increase in tangibility of assets will result in a decrease in banks' profitability. Similarly, using *ROE*, under random effects model total debt, bank size had a significant positive impact on banks' profitability as tangibility of assets had a significant adverse effect on bank performance.

About the effect of bank size, these results are also in harmony with those of Jahan (2012); Rao and Lakew (2012); Flamin *et al.* (2009) who observed a positive impact on bank performance. They attributed this to the modern intermediation financial theory in which bank efficiency is realized through economies of scale related to the bank size. Thus the bigger the size of banks, the greater the positive effect on bank performance. However, the current findings contradict those of Obamuyi (2013) who found a negative impact on bank profitability. Both short-term debt and long-term debt did not affect banks performance.

b = consistent under Ho and Ha; obtained from xtreg; where Ho = Null hypothesis and Ha = Alternative hypothesis

B = inconsistent under Ha, efficient under Ho;

Test: Ho: difference in coefficients not systematic Prob > chi2 = 0.0250, Ha: p-value decision considered.

In Tab. VII, Hausman specification test proposes that fixed effects model was better than random effects model as its p-value is 0.0250 which is less than 0.05 for *ROE* as the dependent variable and this implies that random effects model should be rejected and thus the analysis be based on the fixed effects estimator.

Thus from the above findings of the Hausman test in Tab. VII, the appropriate model for the study is fixed effects model

F (6,193) = 37.44, Prob > F = 0.0000,
R-squared = 0.5379.

R-squared for the regression is 0.5379. This implies that the explanatory variables employed in the model in the current study can explain approximately 54 per cent of the variations in the financial performance supported by return on average assets. The remaining 46 per cent of variations of the financial performance of commercial banks under investigation can be explained by other factors not included in the model. The F-statistics signifies that at least one of the explanatory variables is considerably related to bank profitability.

Following the findings of the fixed effects model using *ROA* in Tab. VIII, the study realised that there was a strong positive relationship between total debt and banks' performance. A similar positive significant effect between bank size and banks' profitability was noted like it was observed with *ROE* in Tab. VI. The study also realised a significant negative relationship between short-term debt and bank performance. This means that as short-term debt increases, bank performance declines. These results are in conformity with those of Abdel-Jalir (2014) who

VIII: *Regression model-2 – FE and RE –ROA*

| Variables | FE Model(ROA) | RE Model(ROA) |
|---|---|---|
| ***BANK SIZE*** | 0.2509625 *** (2.67) | 0.3308743 *** (3.61) |
| ***TANG*** | −67.52146 *** (-10.79) | −72.67731*** (−12.19) |
| ***SDA*** | −1.939576 * (−1.71) | −1.87476 * (−1.69) |
| ***LDA*** | 4.207596 (1.54) | 4.288792 * ( 1.67) |
| ***TD*** | 7.87e-06 *** (3.92) | 6.78e-06 *** (3.39) |
| ***CONS*** | 1.51993 *** (3.37) | 0.9067553 * (1.75 ) |

Source: Author's calculations from STATA, 2018, Robust standard errors in parentheses *$P < 0.10$, **$p < 0.05$, ***$p < 0.01$

IX: *Hausman specification test for ROA Model*

| | (b) | (B) | (b-B) | sqrt(diag(V_b-v_B)) |
|---|---|---|---|---|
| **Variables** | **(Fe)** | **(Re)** | **(Difference)** | |
| ***BANKSIZE*** | 0.2509625 | 0.3308743 | −0.0799118 | 0.0209991 |
| ***TANG*** | −67.52146 | −72.67731 | 5.155845 | 1.912385 |
| ***SDA*** | −1.939576 | −1.87476 | −0.0648153 | 0.238104 |
| ***LDA*** | 4.207596 | 4.288792 | −0.0811957 | 0.9262065 |
| ***TD*** | 7.87e-06 | 6.78e-06 | 1.09e-06 | 1.96e-07 |
| ***cons*** | 1.51993 | 0.9067553 | 0.6131742 | 0.5231432 |

realised a negative relationship between debt ratio and return on investments.

Similarly, the study realised a negative relationship between tangibility of assets and bank performance. From the current study, using the random-effects model in Tab. VIII, the study observed all capital structure variables having a significant relationship with *ROA*. In this case, total debt and long-term debt had a significant positive effect on bank performance.

These results are in agreement with the prior empirical studies of Arbabiyan and Safari (2009); Abor (2005); Nikoo (2015); Salteh *et al.* (2012) who observed a positive impact of capital structure variables on profitability. Short-term debt and tangibility of assets had a significant adverse effect on bank performance as bank size had a significant positive effect on bank performance.

b = consistent under Ho and Ha; obtained from xtreg; where Ho = Null hypothesis and Ha = Alternative hypothesis

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

Prob > chi2 = 0.0000, Ha: p-value decision considered

X: *Regression model-2 – FE and RE –CTI*

| VARIABLES | FE(*CTI*)model | RE(*CTI*)model |
|---|---|---|
| ***BANK SIZE*** | −1.067756 (−0.42 ) | −2.332132 (−0.96) |
| ***TANG*** | 1169.193 *** (6.84 ) | 1231.421 *** (7.85) |
| ***SDA*** | 97.39128 *** (3.14 ) | 96.61171 *** (3.29) |
| ***LDA*** | 9.575602 (0.13 ) | −16.08162 (−0.24) |
| ***TD*** | −0.0001261 ** (−2.30) | −0.0001097 ** (−2.06) |
| ***CONS*** | −22.53275 * (−1.83) | −11.29191 (−0.87) |

Source: Author's calculations from STATA, 2018, Robust standard errors in parentheses *$P < 0.10$, **$p < 0.05$, ***$p < 0.01$,

XI: *Hausman specification test for CTI Model -3*

| | (b) | (B) | (b-B) | sqrt(diag(V_b-v_B)) |
|---|---|---|---|---|
| **Variables** | **(Fe)** | **(Re)** | **(Difference)** | |
| ***BANKSIZE*** | −1.067756 | −2.332132 | 1.264376 | 0.8561025 |
| ***TANG*** | 1169.193 | 1231.421 | −62.22801 | 68.32713 |
| ***SDA*** | 97.39128 | 96.61171 | 0.7795733 | 10.04297 |
| ***LDA*** | 9.575602 | −16.08162 | 25.65722 | 32.15886 |
| ***TD*** | −0.0001261 | −0.0001097 | −0.0000164 | 0.0000137 |
| ***cons*** | −22.53275 | −11.29191 | −11.24083 | 8.11067 |

Source: Authors calculations from STATA, 2018

From the results of the Hausman specification test in Tab. IX, the study chooses a fixed effects model as the appropriate model for the study.

F (6,193) = 23.81, Prob > F = 0.0000,
R-squared = 0.4253.

R-squared for the regression is 0.4253. This implies that the explanatory variables used in the model in the current study can explain approximately 43 per cent of the variations in the financial performance metric, cost to income ratio. The remaining 57 per cent of variations of the financial performance of commercial banks under investigation can be explained by other factors not included in the model. The F-statistics signifies that at least one of the explanatory variables is considerably related to bank performance.

From the investigations of fixed effects model using *CTI* in Tab. X, the study portrays that there was a strong positive relationship between short-term debt and banks' performance as well as between tangibility of assets and performance using cost to income ratio (*CTI*). This implies that an increase in short-term debt or tangibility of assets will increase bank performance respectively, thereby enhancing banks' efficiency. The study also realised that total debt impacted negatively on banks' performance. Bank size and long-term debt were observed to be insignificant on banks' performance. Similarly, using the random-effects model, the study in Tab. X, observed that tangibility of assets, as well as short-term debt, strongly impacted positively on bank performance. Total debt impacted negatively on performance. Both bank size and long-term debt had an insignificant negative relationship with bank performance as in Tab. X.

b = consistent under Ho and Ha; obtained from xtreg, where Ho = Null hypothesis and Ha = Alternative hypothesis

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

Prob > chi2 = 0.2219, Ho: p-value decision considered.

From the results of the Hausman specification test, an appropriate model for the study is the random effects model.

XII: *Regression model-4 – FE and RE –NIM*

| VARIABLES | FE(NIM)model | RE(NIM)model |
|---|---|---|
| ***BANK SIZE*** | 0.6602007 *** (7.40) | 0.6523777 *** (7.42) |
| ***TANG*** | −10.66723 * (-1.80) | −9.294151 (-1.61) |
| ***SDA*** | −0.5291424 (-0.49) | −0.244683 (-0.23) |
| ***LDA*** | 7.962035 ** (3.07) | 9.178335 *** (3.66) |
| ***TD*** | 3.25e-06 * (1.71) | 2.85e-06 (1.51) |
| ***CONS*** | 1.232299 ** (2.88) | 1.017482 (1.64) |

Source: Authors calculations from STATA, 2018 Robust standard errors in parentheses *$P$<0.10, **$p$< 0.05, ***$p$<0.01

Results in Tab. XI, Hausman specification test proposes that the random effects model was better than fixed effects model as its p-value is 0.2219 which is higher than 0.05 for *CTI* as the dependent variable and this implies that fixed effects model should be rejected and thus the analysis should be based on the random effects estimator.

F (6,193) = 79.31, Prob > F = 0.0000,
R-squared = 0.7114.

R-squared for the regression is 0.7114 which implies that the explanatory variables used in the model in the current study can explain 71 per cent of the variations in the financial performance metric, net interest margin. The remaining 29 per cent of variations of the financial performance of commercial banks under investigation can be explained by other factors not included in the model. The F-statistics signifies that at least one of the explanatory variables is considerably related to bank performance.

From the investigations of fixed effects model using NIM in Tab. XII, the study realised that there was a positive relationship between long-term debt and bank performance and so did between total debt and performance using net interest margin. This means that an increase in capital structure variables will increase bank profitability. The study also observed that bank size impacted positively on profitability. The study realised that tangibility of assets affected negatively on performance. This implies that an increase in tangibility of assets will result in a decline in profitability. The short-term debt had a negative relationship with performance though statistically insignificant.

Similarly, using the net interest margin as a performance measure under the random effects model Tab. XII, the study realised a positive relationship between long-term debts and banks' performance. This means that an increase in long-term debt will result into increase in profitability. A similar relationship between bank size and net interest margin was realized. The tangibility of assets, short-term debt and total debt had an insignificant impact on performance as per the random effects model.

b = consistent under Ho and Ha; obtained
from xtreg, where Ho = Null hypothesis and
Ha = Alternative hypothesis

B = inconsistent under Ha, efficient under Ho;
obtained from xtreg

Test: Ho: difference in coefficients not systematic

Prob > chi2 = 0.0084; Ha: p-value decision
considered.

Results in Tab. XIII, Hausman specification test proposes that fixed effects model was better than random effects model as its p-value is 0.0084 which is less than 0.05 for NIM as the dependent variable and this implies that the random effects model should be rejected and thus the analysis are based on the fixed effects estimator.

XIII: *Hausman specification test for NIM Model – 4*

| | (b) | (B) | (b-B) | sqrt(diag(V_b-v_B)) |
|---|---|---|---|---|
| **Variables** | **(Fe)** | **(Re)** | **(Difference)** | |
| ***BANKSIZE*** | 0.6602007 | 0.6523777 | 0.0078231 | 0.0155577 |
| ***TANG*** | −10.66723 | −9.294151 | −1.373075 | 1.361611 |
| ***SDA*** | −0.5291424 | −0.244683 | −0.2844594 | 0.1773391 |
| ***LDA*** | 7.962035 | 9.178335 | −1.2163 | 0.6424296 |
| ***TD*** | 3.25e-06 | 2.85e-06 | 3.99e-07 | 2.19e-07 |
| ***cons*** | 1.232299 | 1.017482 | 0.2148172 | 0.1131161 |

Source: Author's calculations from STATA, 2018

## CONCLUSION

By employing data of 20 commercial banks for the period 2006–2015, the current study empirically examined the effects of capital structure on banks' performance in Uganda. The findings demonstrate that all capital structure variables have a significant effect on banks' performance, for instance, *LDA* (long-term debt) and *TD* (Total debt) have a significant positive effect on NIM

(Net interest margin) regression. Total debt has a significant effect on return on assets as well as return on equity regressions. SDA (Short-term debt) also has a significant positive effect on banks' performance measured by *CTI* (Cost to Income Ratio) regression. Since cost to income ratio is a measure of bank efficiency, therefore short-term debt ratio had a significant positive effect on bank efficiency. This implies that with more debt financing into banks, efficiency is enhanced. These findings are consistent with the previous studies by Nikoo (2015); Gill *et al.* (2011); Abor (2005) who observed a significant positive impact of capital structure variables on profitability. Abor (2005) and Gill, *et al.* (2011) used *ROE* as their performance measure. Meanwhile, the study realized an insignificant relationship of long-term debt on return on assets, return on equity and cost to income ratio. Therefore, it implies that long-term debt had no significant effect on performance as those three dependent variables were used. In the same vein, the short-term debt had no effect on performance when return on equity and net interest margin were used as profitability measures respectively.

Nikoo (2015) employed a sample of seventeen banks from 2009 through 2014 for the Iranian banks and realised a significant positive impact of capital structure variables on the sampled banks as he used return on equity, return on assets and earnings per share as his performance metrics. In the current study's regressions under Tab. VIII and Tab. X, using *ROA* and *CTI* as dependent variables and short-term debts and total debts, as independent variables, there was an adverse effect on bank performance respectively. This means that banks in Uganda must ensure they reduce debts as they affect their profitability.

Additionally, these results are also consistent with those of Arbabiyan and Safari (2009) as they observed a significant positive association between short-term debt and total debt with return on equity as a profitability measure though the primary challenge with this study was that they used a single performance indicator to determine performance and that was return on equity only.

However, the current study findings contradict with those of Hasan *et al.* (2014); Salim and Yadav (2012) who observed a significant negative impact of capital structure variables on profitability. The current study also realised that bank size had a significant positive effect on profitability. This is observed with *ROA*, *ROE* and NIM as profitability measures. Hence regarding bank size, the current study results are in harmony with the previous empirical studies of Jahan (2012); Rao and Lakew (2012); Flamin *et al.* (2009), though contrary to those of Obamuyi(2013)who found a significant negative relationship between size and profitability.

Similarly, the study observed a significant positive effect of tangibility of assets on performance as cost to income ratio was used. This means that the tangibility of assets enhanced banks' efficiency thereby increasing bank profitability. However, the study identified a significant negative effect of tangibility of assets on profitability as *ROA*, *ROE* and NIM were used to determine the performance of banks. This implies that an increase in the tangibility of assets means a decrease in performance and vice versa.

Hence, considering the empirical results of the current study, it can be concluded that capital structure impacts on bank performance since there are significant positive effects of capital structure on profitability as in the case of the Ugandan banking sector perspective for the period under which this investigative study was conducted.

The current findings portray that profitable banks rely more on debt as their financing option. This is based on the current study results, following the positive relationship between long-term debt, total debt and net interest margin as a profitability measure. More so there is a positive relationship between short-term debt and cost to income ratio used as another profitability measure. Results also portray that approximately 4 and 68 per cent of total assets are represented by long-term debts and short-term debts respectively confirming the fact Ugandan banks largely depends on short-term debt financing for their operations compared to long-term debt. This seems to conform to the usual practice as banks working capital is premised on customers' deposits and could also be attributed to the difficulties in accessing long-term credit to support banking operations in Uganda

Hence, as a matter of recommendation, it is essential to appreciate that banks are very vital institutions for the triumph of any economy across the globe, though they are usually puzzled with the debt-equity issue when it comes to making prudent financial decisions as they need to

realize sound and sustainable profits in order to remain in business comfortably. This means that banks need to secure financing decisions more prudently to gain a competitive advantage in the banking sector market. Thus banks need to know and appreciate the fact that the financing decisions they consider during business operations will always have a significant influence on their profitability levels.

Hence in the light of the above statement banks need to embrace the following to enhance their profitability.

Following the current empirical study findings, it's been observed that in the case of the Ugandan banking industry, a higher degree of 68 % debt is reflected with the short-term debt ratio. However much as interest on the debt is tax deductible, higher magnitudes of debt expose institutions to default risks that may accelerate chances of bankruptcy for such institutions. Hence, banks should endeavor to consider employing optimal capital structure means. The optimal capital structure situation, in this case, may consist of some debts though not entirely hundred per cent debts only. In a nutshell, the best case scenario should be a debt/ equity ratio for a bank which will eventually minimise the cost of capital for the bank's continued business operations or sustainability. Thus such a situation will reduce the degree of bankruptcy for a bank.

Hence, banks should consider employing more internal financing sources to enhance profitability. They should only go for debt financing as a last resort and must endeavour to look for cheap debt financing means to realise an impactful economic sense out of it.

More so, executive banking management teams should aim at making prudent financing decisions to remain at the top of the profitability game competitively in the banking industry.

Ugandan commercial banks should conduct more aggressive deposit mobilisation campaign drives to gain more deposits and should as well be mindful of using the amassed deposits effectively and efficiently. To realise this, they should propose and design excellent and attractive lending rates in the market to get more customers onboard for credit extension. This will eventually enable them to have a competitive advantage in the industry.

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